2.0 Description of Nuclear Power Plant and Site and Plant Interaction with the Environment

The R.E. Ginna Nuclear Power Plant (Ginna) is located 6 km (4 mi) north of Ontario, New York, in the northwest corner of Wayne County and on the south shore of Lake Ontario. The Ginna site is approximately 32 km (20 mi) east of the city of Rochester and 64 km (40 mi) west-southwest of Oswego, New York. The plant consists of one unit equipped with a nuclear steam supply system supplied by Westinghouse Electric Corporation that uses a pressurized water reactor (PWR) and a once-through cooling system. The plant and its environs are discussed in Section 2.1, and the plant's interactions with the environment are presented in Section 2.2.

2.1 Plant and Site Description and Proposed Plant Operation During the Renewal Term

The immediate area around the Ginna site is rural. There are no substantial population centers, industrial complexes, airports, transportation arteries, or parks within a 5-km (3-mi) radius of the site, and the only recreational facility within this radius is the Bear Creek boat ramp located about 2.4 km (1.5 mi) east of the site. The largest community within 16 km (10 mi) of the site is Webster, which is located in Monroe County. Webster, with a town population of about 38,000, is about 11 km (7 mi) west-southwest of the site (RG&E 2002a). The largest metropolitan area within an 80-km (50-mi) radius is Rochester, which is approximately 32 km (20 mi) west of the site and has with a population of about 220,000. Figures 2-1 and 2-2 show the location of Ginna in relationship to the counties and important cities and towns within an 80-km (50-mi) and 10-km (6-mi) radius, respectively.

The Ginna site is owned by the Rochester Gas and Electric Corporation (RG&E). The site has increased from 137 ha (338 ac) in 1972 to the present size of 197 ha (488 ac), and correspondingly, the shoreline extent has increased from about 0.6 km (1 mi) to 0.9 km (1.5 mi).

There are three occupied farm houses on the site that are owned by RG&E, and the occupants have leases that are renewable annually at the option of RG&E. There are a number of unoccupied buildings on the site. With the exception of some physical security improvements, there are no plans for additional building onsite. The physical security improvements are not related to license renewal.

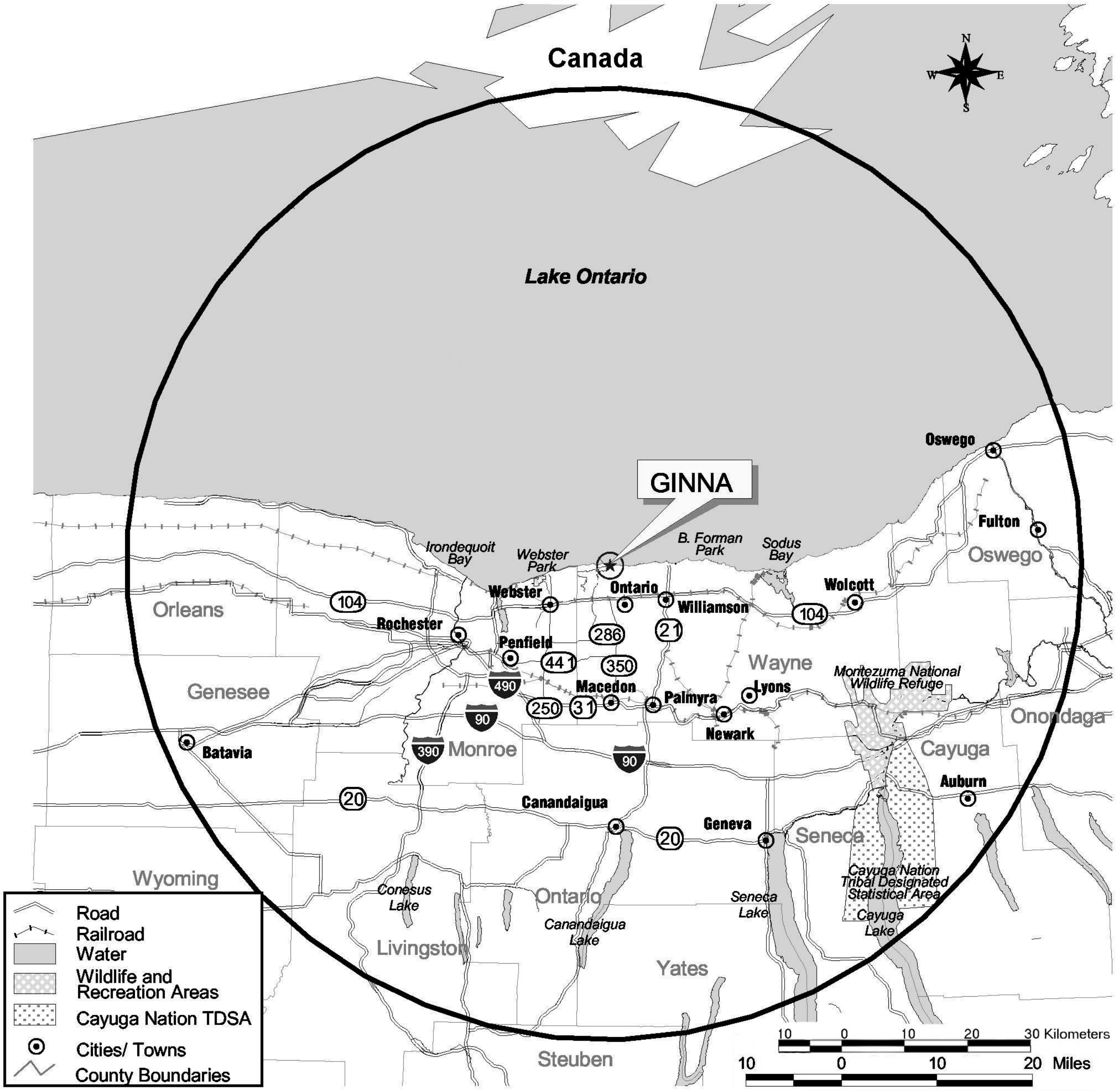
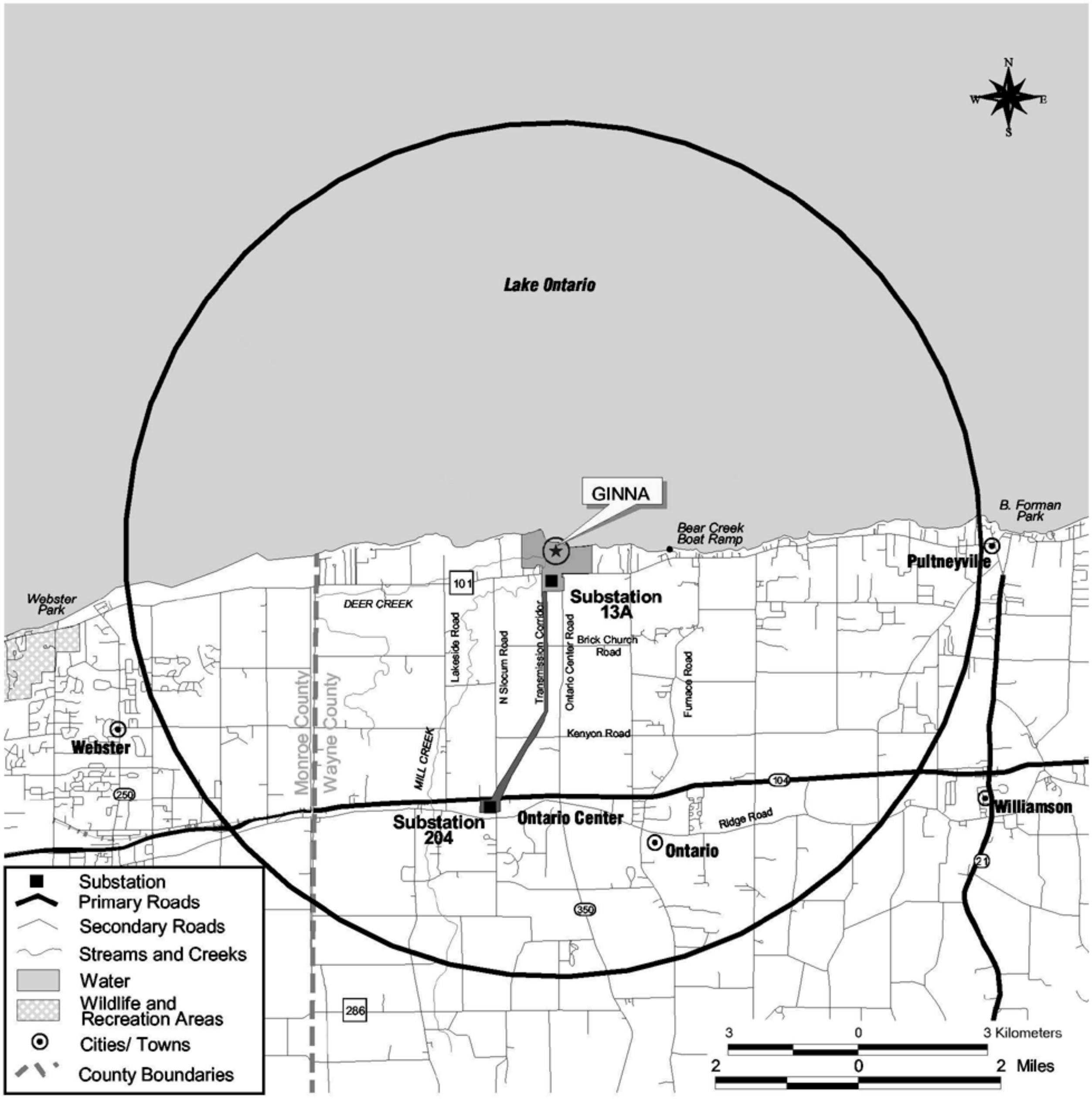


Figure 2-1. Location of R.E. Ginna Nuclear Power Plant, 80-km (50-mi) Region



1 **Figure 2-2**. Location of R.E. Ginna Nuclear Power Plant, 10-km (6-mi) Region

The surface of the terrain at the Ginna site on the south shore of Lake Ontario and to the east and west is either flat or gently rolling. The elevation of the site increases to the south from about 78 m (255 ft) above mean sea level (msl) near the edge of Lake Ontario; to 134 m (440 ft) at New York State (NYS) Route 104, which is 5.5 km (3.5 mi) south of the lake; and then to about 488 m (1600 ft) at the northern edge of the Appalachian Plateau, which is 48 to 64 km (30 to 40 mi) to the south. Southward from NYS Route 104, the topography gradually changes to a series of small abrupt hills commencing about 16 km (10 mi) south of the site. Surface-water features on the site are limited to Mill Creek, which enters the site from the south, and Deer Creek, which enters from the west. These two creeks join southwest of the plant and empty into Lake Ontario just east of the plant. The general plant area is relatively well drained, with no topographic basins or swampy areas on the site. All drainage, both surface and subsurface, ultimately flows toward the lake.

2.1.1 External Appearance and Setting

The plant is visible from Lake Road (County Route 101), which borders the site in an east-west direction approximately 518 m (1700 ft) south of the plant. A distinctive design feature of the plant is a facade that conceals the dome of the reactor containment building, thus minimizing the aesthetic impact of the plant on the surrounding community. The area around the site is rural and the agricultural production and undisturbed land onsite enhances this appearance.

Major structures in addition to the reactor building are the auxiliary building, intermediate building, control building, turbine building, screen house, condensate demineralizer building, standby auxiliary feedwater pump building, and the service building containing offices, shops, and laboratories. Figure 2-3 identifies the major buildings on the site.

The Ginna site is located in the lake plain, a slender band of land bordering Lake Ontario that is about 8 to 48 km (5 to 30 mi) wide. The terrain is flat-to-rolling and contains numerous short streams that flow northward directly into Lake Ontario (AEC 1973). The surrounding region has agricultural land and rural communities.

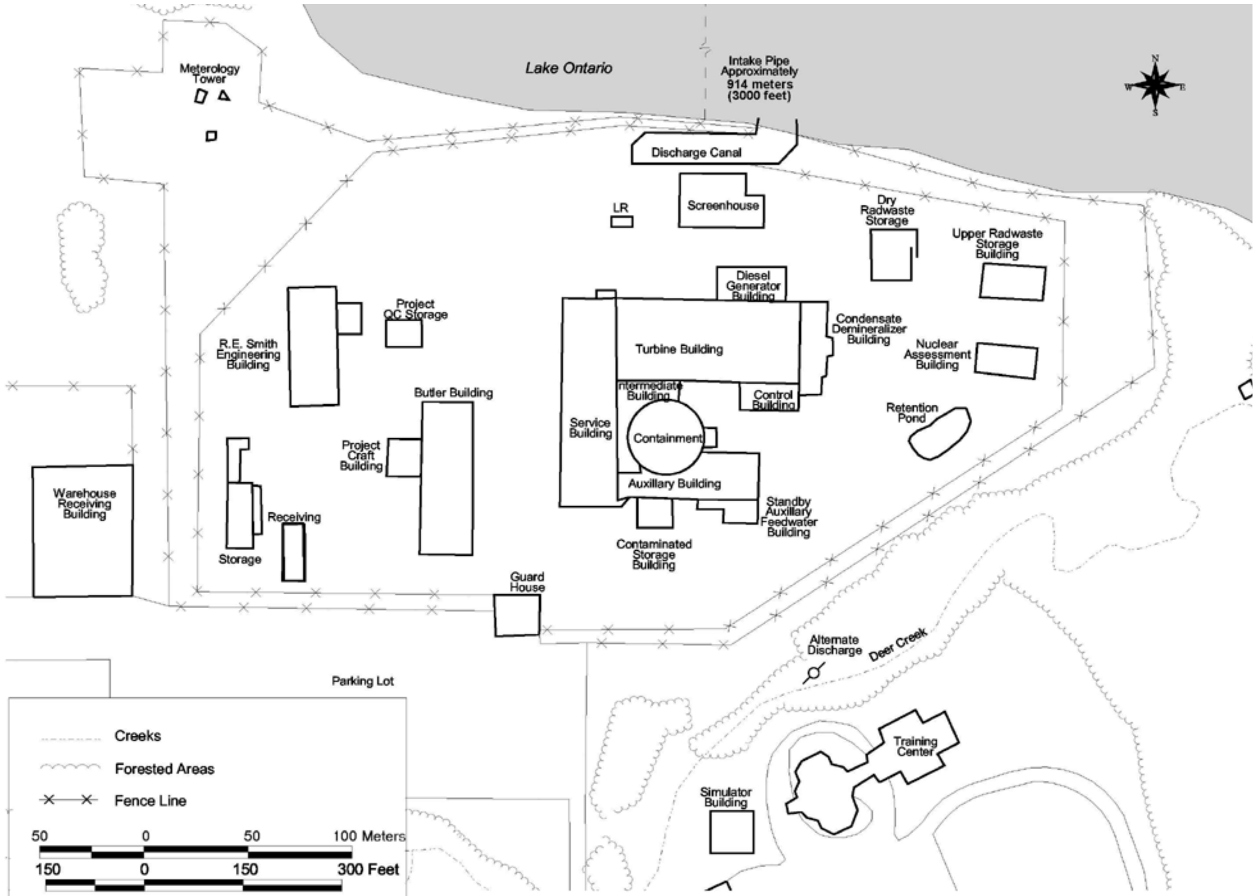


Figure 2-3. R.E. Ginna Nuclear Power Plant Layout

2.1.2 Reactor Systems

The Ginna reactor is a pressurized light-water-moderated and -cooled system designed by Westinghouse Electric Corporation. The system has two identical heat-transfer closed loops, each of which includes a reactor coolant pump and a steam generator connected to the reactor vessel. Ginna began commercial operation in July 1970 at a licensed output of 1300 megawatts thermal power (MW[t]) and at 420 MW net electrical power (MW[e]). On March 1, 1972, on the basis of additional safety and environmental evaluations, the licensed output was increased to 1520 MW(t) and the net electrical output was increased to 490 MW(e).

The reactor containment is a vertical, cylindrical, reinforced-concrete type with pre-stressed tendons in the vertical wall; a reinforced-concrete ring anchored to the bedrock; and a

reinforced semi-hemispherical dome. The major components of the reactor coolant system are located within the containment structure. The containment structure provides a physical barrier to protect the equipment from natural disasters and shielding to protect personnel from radiation emitted from the reactor core while at power. A welded steel liner is attached to the inside face of the concrete shell to provide leak-tightness. The reactor vessel is located in the center of the containment structure below ground level. The reactor is licensed to use uranium dioxide fuel that has a maximum enrichment of 5.0 percent uranium-235 by weight. Typical average enrichment is 4.2 percent uranium-235 by weight. The approximate maximum average burnup is less than 55,000 megawatt-days per metric ton uranium (MWd/MTU).

2.1.3 Cooling and Auxiliary Water Systems

Lake Ontario is the source of water for the turbine condenser cooling and most auxiliary water systems at Ginna. Water from Lake Ontario reaches Ginna through a submerged offshore intake. Water returns to Lake Ontario through a surface shoreline discharge. The total nominal flow of water for these systems is about 22,370 L/s (354,600 gpm). A flow of approximately 21,245 L/s (340,000 gpm) is used to cool the turbine condenser, and the rest of the water is available for auxiliary systems such as service water and fire protection.

The turbine condenser cooling system removes heat via the main condensers. The system consists of an offshore intake structure designed specifically to minimize the possibility of clogging, an inlet tunnel, four traveling screens, two circulating water pumps, and shoreline discharge via a short discharge canal. The intake structure is located 945 m (3100 ft) from shore at a depth of about 10 m (33 ft) water at mean lake level. Even an occurrence of a historical low water level will result in no less than 4.6 m (15 ft) of water covering the intake structure. Screen racks with bars spaced 25 to 35 cm (10 to 14 in.) apart prevent large objects from entering the system. At full-flow conditions (22,370 L/s [354,600 gpm]), the velocity at the intake screen racks is about 0.2 m (0.8 ft) per second. A 3-m (10-ft) diameter, reinforced-concrete-lined tunnel cut through bedrock extends 945 m (3100 ft) in a northerly direction from the shoreline. Before the intake water reaches the two circulating water pumps that send it through the plant, the water passes through one of four parallel traveling screens. Some of this water is used to flush the debris off the screens into the discharge canal. All fish and debris, excluding collections taken during impingement studies, are returned to Lake Ontario via this discharge canal.

Water used to cool the turbine condenser is discharged into the discharge canal. The water discharged into the canal enters Lake Ontario at the shoreline. The normal temperature increase over the ambient water temperature at the point of discharge is about 11°C (20°F), and the size of the thermal plume is normally about 71 ha (175 ac).

The auxiliary system includes service water, fire protection, and other uses. This is about 1125 L/s (14,600 gpm) of the total water volume pumped by these systems. The service water system consists of four service water pumps located in the screen house. The service water system circulates lake water from the screen house to various heat exchangers and systems inside the containment and the auxiliary, intermediate, turbine, and diesel generator buildings. The service water system supplies cooling water for various plant needs. It provides multiple water source flow paths to ensure the availability of the ultimate heat sink, which is the lake.

The treated water system, one of the auxiliary systems, is used in the following secondary plant subsystems: demineralized water production, secondary water chemical treatment, and non-radioactive liquid waste disposal (floor drains, secondary sample effluents, etc.). The treated water subsystems are non-safety-related auxiliary systems that support the functionality of other process systems.

Domestic-quality potable water, at a flow of about 378,000 L/d (100,000 gpd), is purchased by RG&E from the Ontario Water District for drinking, sanitary purposes, auxiliary boiler feed, and condensate makeup and polishing. Sanitary waste from Ginna is discharged into the wastewater treatment system operated by the town of Ontario.

2.1.4 Radioactive Waste Management Systems and Effluent Control Systems

Ginna uses liquid, gaseous, and solid radioactive waste management systems to collect and process the wastes that are by-products of reactor operation. These systems reduce the radioactive effluents before they are released to the environment. Discharge streams are appropriately monitored, and safety features are incorporated to preclude releases in excess of the limits specified in 10 CFR Part 20 and to maintain radioactive discharges to levels as low as reasonably achievable (ALARA) according to the requirements of 10 CFR Part 50, Appendix I.

Waste disposal facilities are designed so that discharge of effluents and offsite shipments are in accordance with applicable U.S. Nuclear Regulatory Commission (NRC) regulations and guidelines. Radioactive fluids entering the waste disposal system are collected in sumps and tanks until a determination of subsequent treatment can be made. The waste is sampled and analyzed to determine the quantity of radioactivity, and an isotopic breakdown is determined if necessary. Before any attempt is made to discharge this waste, it is processed as required and then released under controlled conditions. The system design and operation are directed toward minimizing releases to unrestricted areas.

Radioactive gases are pumped by compressors through a manifold to one of the gas decay tanks where the gases are held for a suitable period of time for decay. Cover gases in the nitrogen blanketing system are reused to minimize gaseous wastes. During normal operation,

gases are discharged intermittently at a controlled rate from these tanks through the monitored plant vent. The system is provided with discharge controls so that environmental conditions do not restrict the release of radioactive effluents to the atmosphere.

The waste disposal system is designed to package all solid waste in standard liners and other approved packages for removal to burial or processing facilities. The types of solid waste that are produced at Ginna, in addition to dry active waste, are sludge, oily waste, bead resin, and filters.

Fuel rods that have exhausted a certain percentage of their fuel and then removed from the reactor core for disposal are called spent fuel. Spent fuel is stored onsite in the spent fuel pool. As a result of the Phase-1 rerack and after allowing for a full core discharge capability, sufficient positions remain in the spent fuel pool (based upon projected discharges of 44 fuel assemblies per cycle) to store the projected spent fuel discharge resulting from operation through the spring of 2010 (if Ginna were to continue operating beyond its current license period, which ends in September 2009) (RG&E 2001a).

The Offsite Dose Calculation Manual (ODCM) (RG&E 2002b), which is subject to NRC inspection, describes the methods and parameters used for calculating offsite doses resulting from radioactive liquid and gaseous effluents. It provides monitoring alarm/trip points for release of effluents, and operational limits for releasing liquid and gaseous effluents are specified to ensure compliance with NRC regulations.

2.1.4.1 Liquid Waste Processing Systems and Effluent Controls

Liquid wastes are generated primarily by plant maintenance and service operations. Source term influents to the waste disposal system have changed considerably since the original design of the system. However, the current influent quantities into the system are smaller than the quantities for which the system was originally designed. Actual liquid waste discharge quantity figures are provided in the Radioactive Effluent Release Report required by the plant technical specifications (RG&E 2001b).

Radioactive fluids entering the waste disposal system are collected in sumps and tanks until a determination regarding subsequent treatment can be made. The fluids are sampled and analyzed to determine the quantity of radioactivity, and an isotopic breakdown is determined if necessary. Before any attempt is made to discharge, the waste is processed as required and then released under controlled conditions. The system design and operation are directed toward minimizing releases to unrestricted areas. Discharge streams are monitored and safety

features are incorporated to preclude releases in excess of the limits of 10 CFR Part 20 and to maintain radioactive discharges to ALARA levels according to the requirements of 10 CFR Part 50, Appendix I.

The waste holdup tank (about 79,500 L [21,000 gal]) is the collection point for most primary liquid wastes, via gravity drain where possible. Other drains, such as basement-level drains, drain to a 1419-L (375-gal)-capacity sump tank that is then pumped to the waste holdup tank.

The bulk of the radioactive liquids discharged from the reactor coolant system are processed and retained inside the plant by the chemical and volume control system recycle train. This recycle approach minimizes liquid input to the waste disposal system, which processes relatively small quantities of generally low-activity wastes. The processed water from waste disposal, from which most of the radioactive material has been removed, is discharged through a monitored line into the circulating water discharge. Liquid wastes are processed to remove most of the radioactive materials.

From the waste holdup tank, the wastewater can be processed through a demineralization system to one of two monitor tanks and then either released to the circulating water discharge canal or recycled to the reactor makeup water tank. The waste holdup tank vent line is routed through the auxiliary building charcoal filters. The spent resin is sluiced to a shipping container for disposal.

The 1419-L (375-gal)-capacity auxiliary building sump tank serves as a collecting point for equipment drain water discharged to the basement-level drain header. The drain header receives equipment drains from the refueling water storage tank, residual heat exchangers, chemical and volume control system holdup tanks and recirculation pump, gas stripper feed pumps, boric acid evaporator, spent resin storage tanks, seal water filter, charging pump seal leakoff tank, charging pumps, spray additive tank, seal water heat exchanger, and nonregenerative heat exchanger.

The 189,200 L (50,000 gal), carbon-steel, high-conductivity waste tank is the collection point for condensate polisher regenerant and high-conductivity wastes. These wastes are retained in the tank prior to release into the circulating water system.

The retention tank is the collection point for the various building floor and equipment drains. The tank retains this waste prior to discharging it into the circulating water discharge. The tank's contents are continuously monitored for pH and radioactivity.

The neutralizing tank collects regenerant wastes from the primary makeup water demineralizer system. The tank retains the waste for neutralization prior to discharge to the retention tank.

The monitor tanks are part of the chemical and volume control system. These tanks retain the waste until it is discharged to the circulating water discharge or recycled through the demineralization system to the reactor makeup water tank. The contents of the tanks are sampled for radioactivity prior to discharge.

Liquid batch releases are controlled individually, and each batch release is authorized based on sample analysis and the existing dilution flow in the discharge canal. Plant procedures establish the methods for sampling and analysis of each batch prior to release. A release rate limit is calculated for each batch based on analysis, dilution flow, and all procedural conditions being met before it is authorized for release. The waste stream entering the discharge canal is continuously monitored, and the release would be automatically terminated if the preselected monitor setpoint is exceeded (RG&E 2001a).

If gross beta analysis is performed for each batch release in lieu of gamma isotopic analysis, a weekly composite for principal gamma emitters and iodine-131 is performed. Additional monthly and quarterly composite analyses are performed as specified. The methodology and equations used to calculate activity are included in the Ginna ODCM (RG&E 2002b).

2.1.4.2 Gaseous Waste Processing Systems and Effluent Controls

The gaseous waste management system is designed to collect waste gases from various tanks and sampling systems throughout the plant. The primary source of gas received by the waste disposal system is cover gas displaced from the chemical and volume control system holdup tanks as they fill with liquid. Gaseous wastes consist primarily of (1) hydrogen stripped from coolant discharged to the chemical and volume control system holdup tanks during boron dilution, (2) nitrogen and hydrogen gases purged from the chemical and volume control system volume control tank when degassing the reactor coolant, and (3) nitrogen from the closed gas blanketing system. The gas decay tank capacity allows a 45-day decay period before the waste gas is discharged.

Radioactive gases are pumped to one of the gas decay tanks where they are held for a suitable period of time. Cover gases in the nitrogen blanketing system are reused to minimize gaseous wastes. During normal operation, gases are discharged intermittently at a controlled rate from these tanks through the monitored plant vent. The system is provided with discharge controls so that environmental conditions do not restrict the release of radioactive effluents to the atmosphere.

Because the chemical and volume control system holdup tank cover gases must be replaced when they are emptied during processing, provisions are made to return the gas from the gas decay tanks to the chemical and volume control system holdup tanks via a reuse header.

The gas decay tanks are about 13,300 L (470 ft^3) each, with a design pressure of 1.4 kPa (200 psig), and normally operate between 0 and 750 kPa (0 and 110 psig). They can be lined up for draining, gas analyzer sampling, or pressurization with nitrogen. Gas held in the decay tanks can either be returned to the chemical and volume control system holdup tanks via the reuse header, or it can be discharged to the atmosphere if it has decayed sufficiently for release. Before a tank can be emptied to the environment, it is sampled and analyzed to determine and record the activity to be released, and only then discharged to the plant vent at a controlled rate through a radiation monitor. Samples are taken manually from the gas analyzers. During release (through charcoal filters), a trip valve in the discharge line is closed automatically by a high activity level indication in the plant vent.

The waste disposal panel contains pressure gauges for the tanks using cover gas and also for the gas decay tanks and the vent header. A local plant stack radiation monitor is also provided for the operator's use during releases. All gas system manual operations and releases are controlled locally at the waste disposal panel by the operator. The alarm conditions that are associated with the gaseous waste management system are (1) moisture separator level, (2) vent header pressure, (3) gas analyzer oxygen, (4) plant stack monitor radiation, (5) gas decay tank pressure, and (6) gas decay tank new standby selection. High-pressure alarms are installed on the tanks that vent to the vent header. An alarm on the waste disposal panel will light an annunciator on the main control board.

An automatic gas analyzer is provided to monitor the concentrations of oxygen and hydrogen in the cover gas of the waste disposal system and the chemical and volume control system tanks. The gas analyzer system sequentially selects samples from vessels of the waste disposal system, analyzes the samples for oxygen and hydrogen, records the results of the analysis, and provides alarms when a hazardous operating condition exists. Upon indication of a high oxygen level, provisions are made to purge the systems to the gaseous waste system with an inert gas.

Gaseous effluent monitor setpoints are established at concentrations that permit some margin for corrective action to be taken before exceeding offsite dose rates corresponding to 10 CFR Part 20 limitations. The ODCM (RG&E 2002b) establishes the methods for sampling and analysis for continuous ventilation releases and for containment purge releases, as well as the methods for sampling and analysis prior to gas decay tank releases. The dose rates are determined using methodology included in the Ginna ODCM (RG&E 2002b). Calculations were performed in 1976 to demonstrate conformity with numerical guides on design objectives presented in Appendix I to 10 CFR Part 50 for gaseous effluents.

2.1.4.3 Solid-Waste Processing

The waste disposal system is designed to package solid waste in standard liners and other approved packages for removal to burial or processing facilities. In addition to dry active waste, solid waste produced at Ginna includes sludge, oily waste, bead resin, and filters.

There are two onsite solid waste storage facilities with a combined capacity sufficient to accommodate approximately 5 years of operation. The upper radioactive waste storage facility typically provides temporary storage for plant solid waste. The high-integrity container storage facility is a concrete-walled, open-topped structure designed as a shadow shield for the storage of spent resin. The resin is stored in shielded casks that are ready for shipment. Additionally, a reinforced concrete structure houses the old steam generators and is designed for long-term storage.

Suspended solids and other sludges occasionally require processing. Oily waste is processed at an offsite facility. An alternative method of disposal is to solidify and bury the waste at a licensed burial site.

Bead resin is used to remove chemical impurities and radioactive contamination from the reactor coolant, the chemical and volume control system, the spent fuel pool, and the liquid waste processing system. When the resin is exhausted or reaches a radiation limit, the spent resin is sluiced to one of two 4247-L (1122-gal) spent resin storage tanks. After sufficient resin has been collected, a transport cask sufficient for the radioactivity present is ordered. Spent resin is slurried from the spent resin storage tank into a liner with water used for sparging and mixing the resin, and nitrogen gas pressure is used to move the resin. A representative sample of the resin is obtained and the concentration of each radioisotope is calculated. After the resin is dewatered, the liner is capped and sealed and the top is put on the transport cask. The cask is surveyed for radiation and contamination and properly labeled and marked. The resin is then transported to a licensed disposal facility.

When filters become saturated or have a high dose rate, they are dewatered and then replaced. The spent filters are placed in a high-integrity container or solidified in an approved media and shipped in accordance with 10 CFR Part 71, 10 CFR Part 61, and burial site licenses. Dry active waste is shipped in bulk form to a vendor for volume reduction and packaging for delivery to the disposal site (RG&E 2001a).

The Ginna ODCM (RG&E 2002b) controls the establishment of a program that outlines the method for processing wet solid wastes and solidifying liquid wastes. It includes applicable process parameters and evaluation methods used at Ginna to ensure compliance with the requirements of 10 CFR Part 71 prior to shipment of containers of radioactive waste from the site.

A radioactive waste sampling and analysis program has been instituted to ensure compliance with 10 CFR Part 61. Scaling factors have been developed to calculate concentrations of hard-to-measure isotopes from more easily determined isotopes. The scaling factors will enable concentrations of all required isotopes to be determined for each radioactive waste shipment.

All radioactive waste is shipped to a licensed burial site in accordance with applicable NRC, U.S. Department of Transportation, and State regulations, including burial site regulation requirements. To ensure that personnel exposure is minimized, ALARA considerations are addressed in all phases of the solidification process. The quantities shipped offsite for processing and burial are reported to the NRC in the Radioactive Effluent Release Report (RG&E 2001b).

2.1.5 Nonradioactive Waste Systems

Hazardous, non-radioactive waste is regulated under the Resource Conservation and Recovery Act (RCRA) administered by the New York State Department of Environmental Conservation (NYSDEC), which classifies Ginna as a “small quantity generator and a treater, storer and/or disposer of hazardous waste.” Following their annual inspection in January 2001, NYSDEC concluded that Ginna was in compliance with all New York State hazardous waste regulations (NYSDEC 2001). This conclusion was consistent with their findings during prior annual inspections.

The most common types of hazardous waste generated at Ginna are chemical degreasers, acids, and caustics used to clean parts and rags and paper products contaminated with chemicals regulated under RCRA. There are also chemical products that are discarded due to procedural changes, and minor amounts of asbestos and equipment contaminated with polychlorinated biphenyls (PCBs) due to asbestos and PCB abatement efforts. RG&E’s 2001 Hazardous Waste Regulatory Fee form estimated that 1570 kg (1.73 tons) of hazardous waste was produced at Ginna in 2000 (RG&E 2001c).

2.1.6 Plant Operation and Maintenance

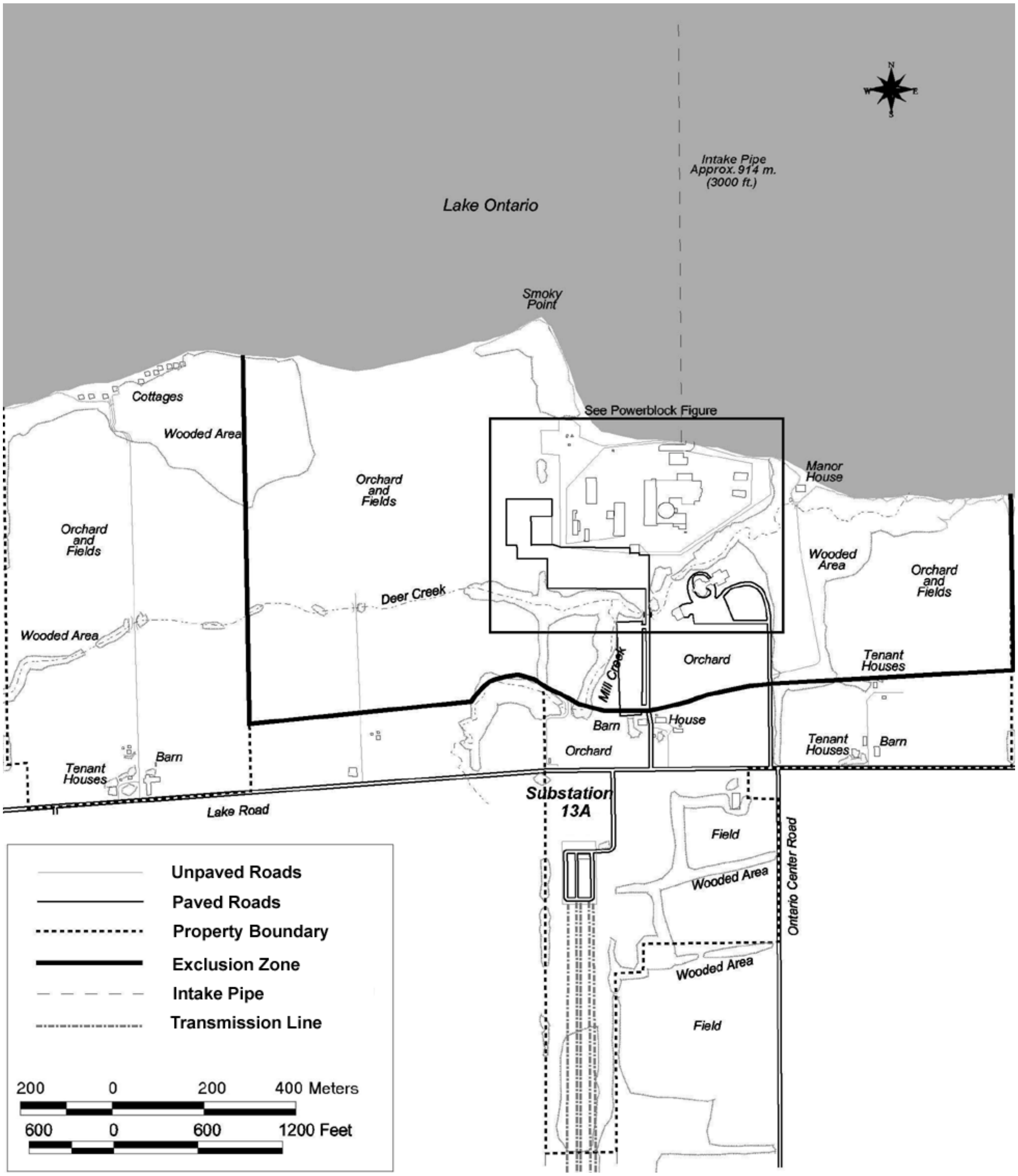
Maintenance activities conducted at Ginna include inspection, testing, and surveillance to maintain the current licensing basis of the plant and ensure compliance with environmental and

safety requirements. Certain activities can be performed while the reactor is operating, but some activities require that the plant be shut down. Long-term outages are scheduled for refueling and for certain types of repairs or maintenance, such as replacement of a major component. RG&E refuels the Ginna nuclear unit on an 18-month schedule, generally resulting in a refueling every other year. During refueling outages, site employment increases by as many as 700 workers for temporary duty (typically lasting from 28 to 35 days) (RG&E 2002a).

An updated final safety analysis report supplement (RG&E 2002c) regarding the effects of aging on systems, structures, and components was included as Appendix A of the Application for Renewed Operating License, in accordance with 10 CFR Part 54. Chapter 3 and Appendix B of the Ginna license renewal application describe the programs and activities that will manage the effects of aging during the license renewal period. RG&E expects to conduct activities related to the management of aging effects during plant operation or normal refueling and other outages, but plans no outages specifically for the purpose of refurbishment. RG&E has no plans to add additional full-time staff (non-outage workers) at the plant during the period of the renewed license.

2.1.7 Power Transmission System

The *Final Environmental Statement for the R.E. Ginna Plant, Unit 1. Rochester Gas and Electric Corporation* (AEC 1973) describes four transmission lines, running in the same right-of-way, that connect the plant with the transmission system. RG&E has not made any modifications to either the right-of-way or the transmission lines since original installation (RG&E 2002a). Ginna generates electricity at 19 kilovolts (kV). This voltage is stepped up to 115 kV at the plant and is transmitted 1.0 km (0.6 mi) by four 115-kV underground cables to Substation 13A, which is located south of Ginna on the south side of Lake Road (Figure 2-4). Four 115-kV overhead transmission lines were installed as a direct result of the construction, startup, and operation of Ginna. These lines emanate from Substation 13A and run approximately 5.6 km (3.5 mi) in the same right-of-way in a southerly direction to connect to the transmission grid at Substation 204 (Fruitland), which is on the south side of NYS Route 104 (Table 2-1). These lines are supported by wooden structures with two lines per structure. There is a fifth 115-kV line emanating from Substation 13A that serves as a distribution line and is located on its own structures on the east side of the transmission lines right-of-way between Substations 13A and 204. This fifth line was not installed as a direct result of construction, startup, or operation of Ginna.



1 **Figure 2-4.** R.E. Ginna Nuclear Power Plant Transmission Lines

The 500-foot-wide transmission lines right-of-way from Ginna to Substation 204 is owned by RG&E. The portion of the right-of-way between Substation 13A and Substation 204 is in the town of Ontario and Wayne County and has road crossings at Brick Church Road, Kenyon Road, North Slocum Road, and NYS Route 104 (Figure 2-2). Locked gates limit access to the right-of-way from roadways. Land use in this area is predominantly agricultural with only a few homes adjacent to the right-of-way.

The transmission lines right-of-way is characterized by low- to medium-sized shrubs with an understory of grasses and forbs, and with trees at the edge of the right-of-way. RG&E manages the right-of-way in accordance with a New York State Public Service Commission-approved long-range vegetation management plan (RG&E 1995). This plan uses selected management techniques with the goal of maintaining a low-growing vegetative community. A relatively thick shrub layer is maintained, with the intention of discouraging the sprouting and growth of larger trees within the right-of-way. Mowing or brush cutting is rare and, when done, is typically performed only in small areas as needed to clear access to towers. Trees that may interfere with the electrical conductors are either trimmed or are cut at the base. Herbicides are generally only used as spot applications to prevent tree or shrub regrowth. RG&E uses only non-restricted-use herbicides, and all applications are performed under the supervision of licensed applicators. RG&E maintains a vegetative buffer along stream crossings and does not mow or treat vegetation with herbicides within wetland areas or stream crossings unless specific, individual trees need to be trimmed or removed to maintain safe operation of the right-of-way.

Table 2-1. R.E. Ginna Nuclear Power Plant Transmission Lines Right-of-Way

Substation	Number of Lines	kV	Approximate Distance		Corridor Direction	Corridor Width		Corridor Area	
			km	mi		m	ft	hectares	(acres)
204 (Fruitland)	4	115	5.6	3.5	South	152	500	85	212

Source: RG&E 2002a

2.2 Plant Interaction with the Environment

Sections 2.2.1 through 2.2.8 provide general descriptions of the environment near Ginna. Detailed descriptions also are provided, where needed, to support the analysis of potential environmental impacts of refurbishment and operation during the renewal term, as discussed in Chapters 3 and 4. Section 2.2.9 describes the historic and archaeological resources in the area, and Section 2.2.10 describes possible impacts of other Federal project activities.

2.2.1 Land Use

Ginna is in the town of Ontario, New York, in the northwest corner of Wayne County and on the south shore of Lake Ontario. Surface-water features onsite are limited to Mill Creek, which enters the site from the south, and Deer Creek, which enters the site from the west. These two creeks join southwest of the plant and empty into Lake Ontario just east of the plant.

Ginna is about 32 km (20 mi) east of the center of Rochester and 64 km (40 mi) west-southwest of Oswego. The immediate area around the site is rural. There are no substantial population centers, industrial complexes, airports, transportation arteries, or parks within a 4.8-km (3.0-mi) radius. The largest community within 16 km (10 mi) of the site is Webster, located in Monroe County approximately 11.2 km (7.0 mi) west-southwest, with a town population of about 38,000 (RG&E 2002a). The largest metropolitan area within 80 km (50 mi) is Rochester, with a population of about 220,000. Approximately, 48 percent of the workforce at Ginna lives in Wayne County and 44 percent lives in Monroe County. The remaining 8 percent live elsewhere.

The 197-ha (488-ac) Ginna site is owned by RG&E. The land at the site and along the transmission line right-of-way is zoned by the town of Ontario for limited industrial uses, while adjacent lands are zoned for large lot residential uses (exceeding 1858 m^2 [20,000 ft^2). The original site area was 134 ha (338 ac) at the time of preparation of the 1972 Environmental Report for Ginna (RG&E 1972). During July 1976, approximately 49 ha (122 ac) of additional land was acquired from an adjoining farm, and another 6.7 ha (16.0 ac) was purchased during 1988 on the western side of the site. Correspondingly, the shoreline extent has increased from about 1.6 to 2.4 km (1.0 to 1.5 mi). More recently, during 2002, a 68-m (224-ft)-wide strip along the western boundary and frontage at the corner of Lake and Slocum Roads was sold by RG&E to a developer who is building a small subdivision. Approximately half of the site is leased and currently is used for agricultural production, primarily apple orchards and, to a lesser degree, corn and hay fields. Another quarter of the site has been left relatively undisturbed, having a combination of open fields, shrub brush, and trees. The remaining quarter of the site has been developed for the power station and ancillary facilities, with about 10 ha (25 ac) enclosed within the security fences.

There are three occupied farm houses on the Ginna site, one of which has an occupied out-building. These houses are owned by RG&E, and the occupants have leases that are renewable annually at the option of the RG&E. Two of the houses are located 1250 m (4100 ft) and 884 m (2900 ft), respectively, southwest of the plant, while the third house and its associated out-building are about 701 m (2300 ft) and 579 m (1900 ft) southeast of the plant, respectively. All are located beyond the exclusion area boundary.

Unoccupied buildings owned by RG&E include the Brookwood Estate Manor House (used as an employee meeting facility) and garage, located about 274 m (900 ft) east of the plant and fronting the lake; horse barns (used for storage), located about 457 m (1500 ft) south of the plant; and a house (used as a fitness-for-duty center), located about 488 m (1600 ft) south of the plant. While there are currently no plans for further development on the site, additional security features have been added, primarily along the perimeter of the plant area. The addition of these security features are unrelated to and independent of license renewal.

Webster Park, a 223-ha (550-ac) Monroe County park on the south shore of Lake Ontario, is approximately 9.6 km (6.0 mi) west of the site. Facilities include a fishing pier, campground, day-use shelters, lodges and cabins, picnic areas, tennis courts, baseball and soccer fields, hiking, and cross-country ski trails. Approximately 56 km (35 mi) from Ginna, in southeastern Wayne County along the border with Cayuga and Seneca counties, is the Montezuma Wetlands Complex. The 14,569-ha (36,000-ac) complex includes the Federally owned Montezuma Wildlife Preserve, state-owned Northern Montezuma Wildlife Management Area, lands owned by conservation groups, and private property. The area contains marshes and impoundments, forested wetlands, old fields, meadows, farm fields, and woodlands (RG&E 2002a).

2.2.2 Water Use

Lake Ontario is the source of water for cooling and most auxiliary water systems. Ginna uses a once-through condenser cooling system with a submerged offshore intake and a surface shoreline discharge. The average daily withdrawal from and return to the lake for the cooling water and other service water systems is about 22,370 L/s (354,600 gpm).

In addition, potable water, at a flow of about 378,000 L/d (100,000 gpd), is purchased by RG&E from the Ontario Water District for drinking, sanitary purposes, auxiliary boiler feed, and condensate makeup and polishing. Sanitary waste from Ginna is discharged to the wastewater treatment system operated by the town of Ontario.

2.2.3 Water Quality

Lake Ontario provides water of a quality sufficient to serve a variety of needs, including propagation of fish and wildlife and contact recreation. However, the lake is listed on the New York State 2002 Section 303(d) List of Impaired Waters as impaired due to fish consumption advisories as a result of contamination by PCBs, Mirex, and Dioxin.

Pursuant to the Clean Water Act, the water quality of the plant effluents is regulated through the National Pollutant Discharge Elimination System (NPDES). The Division of Environmental

Permits within the NYSDEC is delegated by U.S. Environmental Protection Agency (EPA) to issue NPDES permits, which it refers to as State Pollutant Discharge Elimination System (SPDES) permits. The current permit (NY0000493) was issued February 1, 2003, and is due to expire February 1, 2008. Any new regulations promulgated by the EPA or the State of New York would be reflected in future permits.

The current permit requires monitoring of discharges from the circulating cooling water system, house service boiler blowdown system, the high-conductivity water tank discharge system (including steam generator blowdown), and the radiation waste holdup and treatment system. Discharge limitations exist on flow, maximum discharge temperature, incremental temperature difference, chlorine, boron, oil and grease, suspended solids, pH, iron, copper, zinc, arsenic, and chromium.

2.2.4 Air Quality

Ginna has a typical northeastern-U.S. humid climate that is moderated by the influence of Lake Ontario. The nearest national weather station is at the Greater Rochester International Airport (ROC) located about 32 km (20 mi) southwest and inland from the site. The ROC data define the regional climate. The local climate shows lake-effect influences on temperature, moisture, and precipitation.

Climatological records from 1971 to 2000 at ROC indicate that the normal daily maximum temperatures for the region range from -0.6°C (31.0°F) in January to a high of 27.2°C (81.0°F) in July (NOAA 2002). Normal minimum temperatures range from -8.5°C (17.0°F) in January to 15.6°C (60.0°F) in July.

The regional prevailing winds are from the west-southwest. Based on monitoring data for the period 1992 to 1994 at Ginna, local winds are predominantly from south to west-northwest with the peak direction from the south-southwest. The average annual precipitation measured at ROC is 86.31 cm (33.98 in.). Based on statistics for the 30 years from 1954 through 1983, the probability of a tornado striking the site is expected to be about 2×10^{-5} per year (Ramsdell and Andrews 1986).

Locally, weather systems coming from Canada tend to pick up moisture as they cross Lake Ontario and deposit it within 24 to 32 km (15 to 20 mi) of the shoreline. Regional snowfall, as recorded at ROC, averages approximately 236 cm (93 in.) per year. Locations closer to the lake, such as the Ginna site, tend to experience many "lake-effect" snow showers and may have more snowfall than recorded at ROC.

Wind energy potential along the shore of Lake Ontario in the vicinity of Ginna is rated as 3 to 4 on a scale of 1 to 7, with a rating of 5 estimated to exist offshore (Elliott et al. 1986). These ratings indicate that wind is a viable energy resource in the area.

The air quality in the region is designated as better than national standards, in attainment, or unclassified for all criteria pollutants in 40 CFR 81.316 and 40 CFR 81.328. The nearest area of nonattainment is Niagara County, New York, which is classified as marginal for ozone (EPA 2003a). There are no mandatory Class I Federal areas in which visibility is an important value designated in 40 CFR Part 81 within 160 km (100 mi) of Ginna. According to the 1991 to 2000 data from the EPA, the number of days when the air quality index was greater than 100 for ozone in the Rochester Metropolitan Statistical Area (i.e., "Poor Air Quality") ranged from a low of 0 in 1993 and 1996 to a high of 16 in 1991 (EPA 2003b). The EPA reports 1 day in 2001 when the air quality index for ozone was higher than 100 for this area.

Emissions from diesel generators, boilers, and other activities and facilities associated with Ginna operations are regulated under New York state and Federal regulations. Emissions from these Ginna sources are lower than the thresholds specified in the applicable New York State and Federal air quality regulations. Therefore, RG&E is not required to have air quality permits for Ginna.

2.2.5 Aquatic Resources

Aquatic resources in the vicinity of Ginna are associated with Lake Ontario, which is the smallest of the Great Lakes and the eleventh largest lake in the world in terms of volume. The lake is approximately 306 km (190 mi) long by 80 km (50 mi) wide, with a surface area of about 19,000 km^2 (7340 mi^2). The maximum depth is 244 m (802 ft) and the mean depth is 86 m (283 ft), which is greater than the other Great Lakes, except Lake Superior. Depths of 12 to 30 m (40 to 100 ft) are within 0.6 to 1.2 km (1.0 to 2.0 mi) off the southern shore in the area of Ginna. The major source of water for the lake is from Lake Erie via the Niagara River. Water flows from Lake Ontario via the St. Lawrence River to the Atlantic Ocean. The predominant surface currents in front of the station are west to east, and the flows tend to swing towards the southern shoreline (RG&E 2002a).

There are also two creeks that cross the property of the station and the southern shore of Lake Ontario. Mill Creek crosses the site from the south and flows into Deer Creek. Deer Creek enters the site from the west, joins with Mill Creek, and then flows into Lake Ontario. Deer Creek is a wet-weather stream that dries up in the summer months so there is no direct flow into Lake Ontario during that time of the year (RG&E 2002a). Mill Creek, while flowing year-round, does not have sufficient flow to cross over a rise in the land around the mouth of the creek during the summer months. Flow from Mill Creek is possible through the subsurface;

however, aquatic resources could not easily swim in and out of Mill Creek to Lake Ontario during the summer. These creeks do not receive water from Ginna on a routine basis except for occasional storm water runoff. There is a surface impoundment for emergency use that could discharge into Deer Creek.

The aquatic resources associated with Ginna, especially those in Lake Ontario, are an important resource for fishing, recreation, navigation, tourism, and conservation. Currently, the principal fish in Lake Ontario's offshore pelagic fish community are alewife (*Alosa pseudoharengus*) and Atlantic rainbow smelt (*Osmerus m. mordax*), and their salmonid predators, including chinook (*Oncorhynchus tshawytscha*), coho (*O. kisutch*) and Atlantic salmon (*Salmo salar*), lake trout (*Salvelinus namaycush*), rainbow trout (*O. mykiss*), and brown trout (*S. trutta*). Other less abundant pelagic species include threespine stickleback (*Gasterosteus aculeatus*), emerald shiner (*Notropis atherinoides*) and gizzard shad (*Dorosoma cepedianum*) (Schaner et al. 2002). The principal fish in the offshore benthic community include lake trout, lake whitefish (*Coregonus clupeaformis*) and slimy sculpin (*Cottus cognatus*). Additional species include burbot (*Lota lota*), round whitefish (*Prosopium cylindraceum*) and deepwater sculpin (*Triglopsis thompsonii*) (Hoyle and Schaner 2002). The salmon and trout populations are maintained chiefly by stocking programs conducted by the NYSDEC and the Ontario Ministry of Natural Resources. While these stocking programs were initially designed to control non-native fish overpopulation, the salmon and trout are now an important commercial and recreational resource resulting in annual expenditures of over $70 million (Kraft and Carothers 2002).

The Lake Ontario fish community that existed when Ginna began operations during the early 1970s reflected the changes to the fishery over the previous 150 years. The Lake Ontario fishery has been significantly altered over the past 150 years due to frequent introductions of non-native species. Non-native species such as the alewife, rainbow smelt, burbot, threespine stickleback, and several salmon species have profoundly altered the Lake Ontario fishery over the past 100 years. Between the mid-1800s and the early 1970s, populations of important species such as lake sturgeon (*Acipenser fulvescens*), Atlantic salmon, lake trout, lake herring (*Coregonus artedi*), burbot, and deepwater ciscoes (*C. johannae*) had all collapsed. This collapse has been attributed to such factors as overfishing, invasion of sea lamprey (*Petromyzon marinus*), habitat loss, and degraded water quality or eutrophication. The open lake fish community in 1970 was dominated by planktivores such as alewife and smelt due to the lack of large predatory species. Annual alewife die-offs were common at that time, which contributed to the impaired conditions of the lake and shoreline. During the mid-1970s, New York State and the Province of Ontario instituted a salmonid stocking program of up to 8 million fish per year aimed at using the extensive forage base of alewife and smelt. For the next 20 years, this program was very successful in both developing a world-class sport fishery on Lake Ontario as well as controlling the forage fish population (RG&E 2002a).

Water quality in Lake Ontario has changed since the initial plans for Ginna during 1972. There has been a substantial decrease in nutrient loading (particularly phosphorus) and the presence of persistent toxic chemicals. As the water quality has improved, the aquatic community has responded. Other factors in the change of the aquatic resources within the lake over time include control measures for alewife (including the salmonid stocking program), the introduction of non-native aquatic species, ongoing anthropogenic impacts, and natural climate variability (RG&E 2002a).

Evidence of the recent changes in aquatic resources can be seen in the dramatic drop of fish abundance, increases in *Cladophora* sp. (algae), and increases in non-native mollusks of the genus *Dreissena* (zebra and quagga mussels). Fish abundance decreased substantially around 1977 when controls for alewife started to take effect. While numbers of fish have decreased based on data collected by RG&E and by the NYSDEC, the diversity of aquatic species has not changed much and even appears in the last 4 years to be on an upward trend around Ginna. *C.* sp. have been noted to be growing at greater depths in Lake Ontario as the water clarity has improved over the last decade. Mollusks have also been found to be increasing in numbers based on studies by RG&E and by the NYSDEC (RG&E 2002a).

Ichthyoplankton (fish eggs and larvae) studies conducted at the Ginna site during 1977 and 1978 characterize the site with respect to utilization of the Lake Ontario shoreline adjacent to the Ginna site for fish spawning and as a nursery area. More than 90 percent of the fish larvae found during both years were alewives. Also found both years, in the 1-5 percent range, were carp/goldfish (*Cyprinus carpio/Carassius auratus*), smelt, and Johnny darters (*Etheostoma nigrum*). All of these species are common components of the local fish community, and typical of the fish communities found along the near shore areas of Lake Ontario's southern shoreline. Conversely, there were no indications that the Ginna site area was unique to, or preferred by, any species as a spawning or nursery area.

Ginna is not adjacent to any significant bays or other habitat features that may provide unique or important spawning or nursery areas. Studies conducted within Lake Ontario near Chaumont, Sodus, and Irondequoit Bays during 1997 and 1998, show that alewife continues to dominate the ichthyoplankton population and that alewife-spawning locations are ubiquitous. Of particular interest, given the dramatic reduction in productivity within the lake, is the fact that alewife larval densities found during both the late 1970s and the late 1990s were within the same order of magnitude. This indicates the density of alewife larvae available for recruitment have remained fairly constant over time. Further, these recent studies found similar species to those collected at the Ginna intake during the 1970s, and generally support the previously stated conclusions concerning the spawning, nursery, and habitat conditions of the Ginna site (RG&E 2002a).

There are no aquatic species Federally listed as threatened or endangered under the Endangered Species Act (ESA) in the vicinity of Ginna. Through consultation with U.S. Fish and Wildlife Service (FWS), no aquatic species (fish, mollusks, or plants) were identified in Wayne County or any counties near Wayne County (FWS 2002).

There are two State-listed aquatic species known to occur within Wayne County (Table 2-2). Through discussions with NYSDEC, one endangered fish was determined to be near Wayne County (NYSDEC 2003a). The pugnose shiner (*Notropis anogenus*) was reported from Sodus Bay of Lake Ontario, approximately 32 km (20 mi) west of Ginna. However, the pugnose shiner has not been reported near Ginna, nor has it ever been captured during studies conducted by RG&E (RG&E 2002a). The lake sturgeon is a threatened species within New York state and might be found near Ginna (NYSDEC 2003a). One sturgeon was netted several years ago by NYSDEC at Pultneyville, a village approximately 9.6 km (6 mi) east of Ginna. No sturgeon has ever been reported from the vicinity of Ginna (RG&E 2002a).

Table 2-2. Aquatic Species Listed by the New York State Department of Environmental Conservation as Endangered, Threatened, or of Special Concern that are Known to Occur Within Wayne County, New York

Scientific Name	Common Name	State Status
Fish		
Notropis anogenus	pugnose shiner	Endangered
Acipenser fulvescens	lake sturgeon	Threatened

Source: (NYSDEC 2003a).

2.2.6 Terrestrial Resources

The Ginna site lies within the eastern great lakes/Hudson lowlands ecoregion (Omernik 1987). Prior to European settlement, the area was dominated by beech-maple forest that was typical of the region. Throughout the region, much of this forest type has been converted to other vegetation types, primarily various forms of farmland such as orchards, pastures, or crop land (AEC 1973).

The site and its associated transmission line right-of-way are surrounded by a variety of very typical habitat types found in central and western New York state: mature woodlands, meadows, and early- and late-stage old fields. In addition, significant acreage is farmed for grains or is in use for apple production. Portions of the property and the transmission line right-of-way are currently farmed under a lease arrangement with local residents. The other “natural” areas within the boundaries of the site are left to go through the natural succession process and

are not actively managed by the applicant (RG&E 2002a). There are no State or Federally regulated wetlands found either at the Ginna site or on the transmission line right-of-way.

The wildlife species that occur at the Ginna site and transmission line right-of-way are also very typical of those found in similar habitats throughout central and western New York state. Whitetail deer (*Odocoileus virginianus*), woodchuck (*Marmota monax*), gray squirrel (*Sciurus carolinensis*), cottontail rabbit (*Sylvilagus floridanus*), raccoon (*Procyon lotor*), grey (*Urocyon cinereoargenteus*) and red fox (*Vulpes vulpes*), Eastern chipmunk (*Tamias striatus*), and meadow vole (*Microtus pennsylvanicus*) are commonly found mammals. Numerous bird species, including the ring-necked pheasant (*Phasianus colchicus*), American kestrel (*Falco sparverius*), screech owl (*Otus asio*), blue jay (*Cyanocitta cristata*), bluebird (*Sialia sialis*), American goldfinch (*Carduelis tristis*), and crow (*Corvus brachyrhynchos*), are common. Amphibians common to the site include American toad (*Bufo americanus*), leopard frog (*Rana pipiens*), green frog (*R. clamitans*), and wood frog (*R. sylvatica*). Reptiles include the eastern garter snake (*Thamnophis s. sirtalis*) and ribbon snake (*T. sauritus*) (Dames and Moore 1971).

No Federally listed threatened or endangered terrestrial species are known to occur in the vicinity of Ginna or its associated transmission line right-of-way. Table 2-3 lists species known to occur or potentially occur in Wayne County. Bald eagles (*Haliaeetus leucocephalus*) will occasionally be observed in the vicinity, but the nearest known nesting site is approximately 88 km (55 mi) southeast near Montezuma National Wildlife Refuge (NYSDEC 2003a).

Table 2-3. Terrestrial Species Listed as Threatened or Endangered by the U.S. Fish and Wildlife Service that Occur or Potentially Occur Within Wayne County, New York

Scientific Name	Common Name	Federal Status[a]
Reptiles		
Clemmys muhlenbergii	bog turtle	T
Birds		
Haliaeetus leucocephalus	bald eagle	T
Charadrius melodus	piping plover	E
Mammals		
Myotis sodalis	Indiana bat	E
Plants		
Isotria medeoloides	small-whorled pogonia	T
Plantanthera leucophaea	prairie fringed orchid	T

(a) E = endangered, T = threatened
Source: FWS 2002.

The Piping plover (*Charadrius melodus*) could potentially forage on the shoreline near the Ginna site, but it has never been reported in the vicinity and is not known to nest in the area. The nearest designated critical habitat for piping plover is approximately 145 km (90 mi) from the Ginna site on the eastern shore of Lake Ontario (FWS 2001).

The Ginna site is within the historic range of the bog turtle (*Clemmys mulenbergii*), but there are very few known populations remaining along the south coast of Lake Ontario. The nearest known populations are in northern Seneca and in western Oswego Counties (NYSDEC 2003c). Suitable bog turtle habitat is not known to occur on the Ginna Site or its associated transmission line right-of-way (FWS 2000).

The Indiana bat (*Myotis sodalis*) is thought to potentially occur in almost all of New York state, although firm knowledge of the distribution is primarily limited to eight known wintering sites, all located well east of the Ginna site (NYSDEC 1998). Some studies indicate that, although the Indiana bat range extends from the west and south across Pennsylvania to eastern New York, western New York is clearly excluded from the distribution maps (Humphrey 1982; Cope 1999). Relatively little is known about the summer range or habitat requirements of this species.

Neither of the two plant species listed in Table 2-3 (small-whorled pogonia [*Isotaria medeoloides*] and eastern prairie fringed orchid [*Plantanthera leucophaea*]) has been observed recently in New York State, and neither is likely to be present in the vicinity of the Ginna site. The FWS officially lists the small-whorled pogonia as potentially occurring in New York State (FWS 2002), but the listing documentation for this species indicates only historic records in New York State (FWS 1994). The NYSDEC does not list Wayne County in its list of potential counties of occurrence for the small-whorled pogonia (NYSDEC 2002). The NYSDEC does list Wayne County as a potential county of occurrence for the eastern prairie fringed orchid, but also indicates that there are no confirmed occurrences of this species anywhere in New York State (NYSDEC 2002). The FWS listing documentation for the eastern prairie fringed orchid also indicates that this species has not been introduced in New York State (FWS 1989).

Additional species that are listed by NYSDEC as threatened, endangered, rare, or otherwise of concern in New York state that are known to occur in Wayne County are listed in Table 2-4. None of these species are known to occur at Ginna or within the transmission lines right-of-way. The NYSDEC has also listed numerous additional species that it considers as potentially occurring in Wayne County (NYSDEC 2002). Because there are no recent records of any of these additional species from Wayne County, the staff did not consider these further.

Table 2-4. Terrestrial Species Listed by the New York State Department of Environmental Conservation as Endangered, Threatened, or of Special Concern that Occur Within Wayne County, New York

Scientific Name	Common Name	State Status[(a)]
Reptiles		
Clemmys guttata	spotted turtle	SC
Clemmys muhlenbergii	bog turtle	E
Apalone spinifera spinifera	eastern spiny softshell turtle	SC
Birds		
Accipiter cooperii	Cooper's hawk	SC
Accipiter striatus	sharp-shinned hawk	SC
Botaurus lentiginosus	American bittern	SC
Caprimulgus vociferus	whip-poor-will	SC
Charadrius melodus	piping plover	E
Childonias niger	black tern	E
Chordeiles minor	common nighthawk	SC
Circus cyaneus	northern harrier	T
Dendroica cerulea	cerulean warbler	SC
Eremophila alpestris	horned lark	SC
Haliaeetus leucocephalus	bald eagle	T
Melanerpes erythrocephalus	red-headed woodpecker	SC
Vermivora chrysoptera	golden-winged warbler	SC
Mammals		
Myotis leibii	eastern small-footed myotis	SC
Myotis sodalis	Indiana bat	E
Neotoma magister	Allegheny woodrat	E
Syvilagus transitionalis	New England cottontail	SC
Plants		
Aster borealis	rush aster	T
Carex frankii	Frank's sedge	E
Diplachne maritima	salt-meadow grass	E
Isotria medeoloides	small-whorled pogonia	E
Listera australis	southern twayblade	E
Plantanthera leucophoea	eastern prarie fringed orchid	E
Sacheuchzeria palustris	pod grass	R
Scirpus maritimus	seaside bulrush	E

(a) State status: E = endangered, T = threatened, SC = species of special concern, R = rare.
Source: NYSDEC 2002, 2003b, 2003c.

2.2.7 Radiological Impacts

RG&E conducts a radiological environmental monitoring program (REMP) at the Ginna site. Through this program, radiological impacts to workers, the public, and the environment are monitored, documented, and compared to the appropriate standards. The objectives of the REMP are to

- provide representative measurements of radiation and radioactive materials in the exposure pathways and of the radionuclides that have the highest potential for radiation exposures to members of the public

- supplement the radiological effluent monitoring program by verifying that the measurable concentrations of radioactive materials and levels of radiation are not higher than expected on the basis of effluent measurements and the modeling of the environmental exposure pathways.

Radiological releases are summarized in the Annual Radiological Environmental Operating Report (RG&E 2001d) and the Radioactive Effluent Release Report (RG&E 2001b). The limits for all radiological releases are specified in the Ginna ODCM (RG&E 2002b), and these limits are designed to meet Federal standards and requirements. The REMP includes monitoring of the aquatic environment (fish, invertebrates, and shoreline sediment), atmospheric environment (airborne radioiodine, gross beta, and gamma), terrestrial environment (vegetation), and direct radiation.

RG&E's review of historical data on releases and the resultant dose calculations revealed that the doses to maximally exposed individuals in the vicinity of Ginna have been a small fraction of the limits specified in the Ginna ODCM (RG&E 2002b) to meet EPA radiation standards in 40 CFR Part 190 as required by 10 CFR 20.1301(d). For 2001, dose estimates were calculated based on actual liquid and gaseous effluent release data (RG&E 2001b). Calculations were performed by RG&E using the plant effluent release data, onsite meteorological data, and appropriate pathways identified in the ODCM (RG&E 2002b).

During 2001, Ginna did not release any strontium-90 or strontium-89 in either its gaseous or liquid effluents. In 1999 and 2000, there were minor gaseous releases of strontium-89 (1.3×10^{-6} MBq [3.42×10^{-11} Ci] during 1999 and 6.3×10^{-3} MBq [1.69×10^{-7} Ci] during 2000). An assessment of doses to the maximally exposed individual from gaseous and liquid effluents was performed by RG&E for locations representing the maximum dose. In all cases, doses were well below the technical specification limits as defined in the ODCM (RG&E 2002b). During 1999 and 2000, doses had been elevated above 1998 levels due to gaseous effluent activity from a fuel cladding defect in cycle 28 (May 1999 to October 2000). Following the

repair of the fuel cladding defect in cycle 29, dose levels during 2001 were more consistent with those in 1998.

The RG&E assessment of radiation dose to the general public from radioactive effluents assumed a person is located in the vicinity of the National Guard outpost for 10 hours/day, 5 days/week, 50 weeks/year. Although the National Guard post is just within the site boundary, it houses non-RG&E employees who are considered "members of the public." Doses were assessed based on the noble gas exposure, inhalation, ground-plane, and ingestion pathways. For 2001, the total body dose was estimated to be 0.048 mSv (4.8 mrem) total body (0.048 mSv [4.8 mrem] direct radiation plus 1.4×10^{-4} mSv [1.4×10^{-2} mrem] all other pathways) and 2.3×10^{-4} mSv (2.3×10^{-2} mrem) thyroid (maximum organ dose). The ODCM (RG&E 2002b) and 40 CFR Part 190 limits for the total dose to members of the public due to radiation and radioactivity from uranium fuel cycle sources are <0.25 mSv (<25 mrem) total body or any organ and <0.75 mSv (<75 mrem) thyroid for a calendar year. Therefore, doses from Ginna are only a fraction of the regulatory limit.

The applicant does not anticipate any significant changes to the radioactive effluent releases or exposures from Ginna operations during the renewal period; therefore, the impacts to the environment are not expected to change.

2.2.8 Socioeconomic Factors

The staff reviewed the Ginna ER (RG&E 2002a) and information obtained from several county, city, and economic development staff during a site visit to Wayne and Monroe Counties from November 4 through 7, 2002. The following information describes the economy, population, and communities near Ginna.

2.2.8.1 Housing

Ginna employs approximately 500 people on a full-time basis, with more than 80 percent of the normal operating workforce composed of RG&E employees. Approximately 48 percent of these employees (plant and contract employees) live in Wayne County, 44 percent in Monroe County, 2.5 percent in Ontario County, 1.6 percent in Livingston County, with the remainder living in other locations (Table 2-5). Because approximately 92 percent of the Ginna employees live in Wayne and Monroe counties and Wayne County is where the plant is located, the focus of the socioeconomic analysis is on these two counties.

Table 2-5. R.E. Ginna Nuclear Power Plant Employee and Contractor Employee Residence by County in New York State

County	Number of Personnel	Percent of Total Personnel
Wayne	240	48
Monroe	220	44
Ontario	15	3
Livingston	10	2
Other	15	3
Total	500	100

Source: RG&E 2002a

RG&E refuels Ginna on an 18-month cycle. During refueling, the number of employees increases by as many as 700 temporary workers for a period of 30 to 40 days. These temporary employees primarily stay at hotels, motels, and temporary rental housing available in Wayne and Monroe counties (RG&E 2002a).

Table 2-6 provides the number of housing units and housing unit vacancies for Wayne and Monroe counties for 1990 and 2000. Wayne County had approximately 38,800 housing units in 2000, with a vacancy rate less than 10 percent. Monroe County, which has a larger population base and a relatively stronger employment market, had a vacancy rate of approximately

Table 2-6. Total Occupied and Vacant (Available) Housing Units in Wayne and Monroe Counties in New York State, 1990 and 2000

	1990	2000	Approximate Percent Change
WAYNE COUNTY			
Housing Units	35,188	38,767	10
Occupied Units	31,977	34,908	9
Vacant Units	3,211	3,859	20
MONROE COUNTY			
Housing Units	285,524	304,388	6
Occupied Units	271,944	286,512	5
Vacant Units	13,580	17,876	32

Sources: USCB 1990, 2000

6 percent in 2000 based on a housing stock of approximately 304,400 units (USCB 2000a). Wayne and Monroe counties are not subject to growth-control measures that limit housing development.

Table 2-7 contains data on population, estimated population, and annual population growth rates for Wayne and Monroe Counties. Both counties saw similar growth in population during the 1990s.

Table 2-7. Population Growth in Monroe and Wayne Counties in New York State from 1970 to 2020

	Monroe County		**Wayne County**	
	Population	**Percent Change (in 10-year increments)**	**Population**	**Percent Change (in 10-year increments)**
1970[a]	711,917	--	79,404	–
1980[a]	702,238	(-1.4)	84,581	6.4
1990[a]	713,968	1.7	89,123	5.4
2000[a]	735,343	3.0	93,765	5.2
2010[b]	735,708 (est)	0.0	96,931 (est)	3.4
2020[b]	742,150 (est)	1.0	98,454 (est)	1.6

-- = No data available.
(a) USCB 1995, USCB 2000a
(b) GFLRPC 1997

2.2.8.2 Public Services

Public services include water supply, education, and transportation.

- **Water Supply**

The water system of Monroe County is organized at a county level by the Monroe County Water Authority (MCWA), while Wayne County's water system is organized mainly at a town level. Although there is no available estimate of the percentage of households serviced by private wells in the two counties, officials from the Ontario Water District estimate that no more than a dozen households are serviced by private wells. The two counties have five primary surface potable water sources: Lake Ontario, Hemlock Lake, Canadice Lakes, Third Creek Basin, and Canadaigua Lake. In addition, Lyons Village purchases water from Junius Ponds in Seneca County and draws additional water from two wells that are supplied by the Fairport/Lyons Glacial Stream Channel (RG&E 2002a).

The daily consumption and areas served by the major public water supply districts are listed in Table 2-8. The primary public water service providers in Wayne County are the Ontario Water District and the town of Williamson. The Ontario Water District plans to increase the size of its intake pipes, which would result in a doubling of the intake capacity.

The MCWA has a capacity for 585,825 m^3/day (145 MGD) with a peak usage of 461,770 m^3/day (122 MGD). Presently, the MCWA has enough supply to handle an additional 9200 households. Rochester has its own water system with over 2800 ha (7000 ac) of land in the watershed around Hemlock and Canadice Lakes. The city is permitted to draw, on average, 140,045 m^3/day (37 MGD), with a maximum daily usage of 181,680 m^3/day (48 MGD). If the city needs supplemental water, it purchases from the MCWA.

Table 2-8. Major[(a)] Public Water Supply Systems in Monroe and Wayne Counties in New York State

Water System	County	Source	Permitted Capacity m^3/d (MGD)	Average Daily Demand m^3/d(MGD)	Peak Demand Per Day m^3/d (MGD)	Area Served
MCWA	Monroe	Surficial Aquifer	5.5×10^5 (145)	2.3×10^5 (60)	4.6×10^5 (122)	Monroe County except for City of Rochester
City of Rochester	Monroe	Surficial Aquifer	1.8×10^5 (48)	1.4×10^5 (37)	1.8×10^5 (46.5)	City of Rochester
Ontario Water District	Wayne	Surficial Aquifer	1.3×10^4 (3.5)	7.2×10^3 (1.9)	1.3×10^4 (3.5)	Town of Ontario
Town of Williamson	Wayne	Surficial Aquifer	1.5×10^4 (4.0)	6.8×10^3 (1.8)	1.4×10^4 (3.7)	Town of Williamson
Newark	Wayne	Surficial Aquifer	1.3×10^4 (3.5)	5.3×10^3 (1.4)	7.9×10^3 (2.1)	Newark

(a) Only permitted plants with a treatment capacity greater than 3.785×10^3 m^3/day (1 MGD) are listed in the table.
Source: RG&E 2002a, 2002b

- **Transportation**

There are 13 counties wholly or partially within the 80-km (50-mi) radius of Ginna. The 13-county area is served by a network of interstate freeways including Interstate 90 (I-90), I-390, I-490, and I-81. In addition to interstate freeways, the region's transportation network includes an international airport and a train network. The Port of Rochester, at the mouth of the Genesee River, is also available to a limited number of cargo ships and passenger ferries.

I-90 runs east-west through the region connecting the urban area of Rochester with Buffalo and Syracuse. I-390 enters Monroe County from the south and flows into a beltway system that connects the Rochester suburbs, and I-81 runs through Syracuse along the east side of the 13 counties bordering Ginna. The main east-west transportation routes providing access to Ginna are County Route 101 (Lake Road) and NYS Route 104. Lake Road, a two-lane road, provides direct access to Ginna along much of the southern border of the site. NYS Route 104, the predominant east-west corridor near the plant, runs parallel to Lake Road, approximately 5.8 km (3.6 mi) south of Ginna. Ontario Center Road in the town of Ontario runs north-south, connecting NYS Route 104 to Lake Road immediately south of Ginna. Several other secondary roads run north-south providing access to Lake Road from NYS Route 104. Employees commuting from Monroe County and other points west of Ginna are likely to use NYS Routes 104, 441, or 286 to access Lake Road. Employees commuting from the south and east are likely to use north-south corridors NYS Routes 21 and 350 to reach NYS Route 104, and then use Ontario Center Road to Lake Road (RG&E 2002a).

State roads are rated with a “volume/capacity ratio,” which indicates whether the road is being actively used over-capacity (value > 1.0), at-capacity (value = 1.0), or under-capacity (value < 1.0) (RG&E 2002a). In addition, state roads carry “surface score ratings” ranging from a low of “1” (impassable) to a high of “10” (new construction). The highest volume/capacity ratio around Ginna is in Monroe County on a stretch of NYS Route 441 from Route 260 to the Wayne County line. The volume/capacity ratio for this stretch of road ranges from 0.7 to 1.0, which indicates the road is just under- or at-capacity. NYS Route 104 in Monroe County between the Wayne County line and NYS Route 250 has a surface score rating of 5 (i.e., “high-poor” condition), which is the lowest rating of the state roads surrounding Ginna. This is primarily a reflection of the high volume on this stretch of road due to people working for Xerox in Webster and for people commuting to Rochester. In addition, the surface ratings of NYS Route 350 near Ginna and NYS Route 441 between Route 260 and the Wayne County line are rated between 5 and 6; however, most of the state road surfaces in the area are rated around 7 (i.e., “good” condition) (RG&E 2002a).

The Greater Rochester International Airport is located in southwest Rochester just off of I-390, approximately 32 km (20 mi) from Ginna. A primary passenger railway, operated by Amtrak, runs east-west approximately 21.6 km (13.5 mi) south of Ginna. In addition, the Ontario Midland Railroad, a local privately owned “shortline” that feeds into the CSX Transportation lines, operates both passenger and freight service. The east-west portion of the “T” runs approximately 5 km (3 mi) south of Ginna from Webster to Wolcott. The north-south portion of the track runs from Sodus to Newark, 26 km (16 mi) east of Ginna. RG&E owns a corridor of property from the railroad mainline track; however, no track has been built on this corridor (RG&E 2002a).

The Port of Rochester, located on Lake Ontario at the mouth of the Genesee River, was decommissioned as a commercial port in 1980. It now is used by only two cruise ships in the summer. In addition, a cement freighter passes by the Port, but docks farther south on the Genesee River at a cement plant (RG&E 2002b). In recent years the City of Rochester has invested millions of dollars into infrastructure improvements to the port as part of the City's Local Waterfront Revitalization Program. The program involves redeveloping about 11 ha (28 ac) of land and includes the construction of new streets, pedestrian amenities, a new bridge, boat marinas, and infrastructure to support a high-speed ferry operation between Rochester and Toronto, Canada (City of Rochester 2002).

2.2.8.3 Offsite Land Use

Wayne and Monroe Counties are located along Lake Ontario's south shore. The Genesse Finger Lakes Regional Planning Council produces an annual report that contains land-use coverage data based on remote sensing satellite imagery. The results of the 1999 study are found in Table 2-9 (GFLRPC 2001). The Council notes that eastern Monroe and western Wayne Counties are among the fastest growing areas in the region. The following are discussions of land use in each of these two counties.

Table 2-9. Land Use in Wayne and Monroe Counties in New York State

	Wayne County			Monroe County		
Land Use	**Square Kilometers**	**Square Miles**	**Percent of Total**	**Square Kilometers**	**Square Miles**	**Percent of Total**
Water	29.5	11.4	2.0	20.9	8.1	1.0
Urban/Built Up	11.1	4.3	1.0	125.6	48.5	7.0
Forested Areas	821.7	317.4	52.0	517.8	200.0	30.0
Fields	722.1	278.9	45.0	1061.5	410.0	62.0
Total	1584.4	612.0	100.0	1725.8	666.6	100.0

Source: GFLRPC 2001

- **Wayne County**

Wayne County is rich in agriculture, with approximately 840 farms present in 1997. Although the acreage used in farming dropped from 77,423 ha (191,309 ac) to 67,662 ha (167,190 ac) between 1987 and 1997, the county ranks forty-third nationwide in the number of acres dedicated to orchards (255 farms). Other primary crops include corn (358 farms), hay and other grains (342 farms), beef and milk cows (223 farms), oats, potatoes, and vegetables. The land within 8-km (5-mi) radius of Ginna is used principally for growing apples, cherries, grapes, and field crops (RG&E 2002a).

Most of the Wayne County land that is farmland, pastures, grassland, and other areas of non-forested vegetation would be included in the "Fields" category in Table 2-9. The amount of land made up of low-density, large-lot residential developments has increased in recent years, particularly along the west side of the county within a short commute distance from Rochester. There has been relatively little retail or commercial growth. This is also evident from the annual land use census conducted by RG&E to determine land-use changes and identify the nearest gardens and locations of milk animals used for commercial production within 8 km (5 mi) of the station (RG&E 2002d). The NYS Route 104 corridor has been the primary conduit for this growth. In Table 2-9, residential land would be part of the land use categories "Forested Areas," which are all areas with moderate to dense tree coverage, and "Urban/Built Up" land, which includes developed areas as well as roads and parking lots (GFLRPC 2001).

Wayne County is composed of 15 towns, each with an elected Town Supervisor. According to Wayne County Department of Development, the Wayne County towns abutting Lake Ontario do not have any restrictive ordinances placed on growth and development, and there is no reason to suspect that there will be limitations placed on building in the vicinity of Ginna in the foreseeable future (RG&E 2002a).

- **Monroe County**

Monroe County is more developed and industrialized than Wayne County and is home to Rochester, the third largest city in New York State. Monroe County comprises 19 towns, 10 villages, and the city of Rochester. The New York State Constitution grants all cities, towns, and villages the right of "home-rule" power; therefore, county-level, land-use planning is very limited. The county sees its role as very minimal in land-use planning and does not have any restrictions to growth. Recently, however, Monroe County provided $2 million from a tobacco settlement to leverage other local and state funding for the purpose of open space preservation. The suburban towns, however, must initiate the open space actions (RG&E 2002a).

The town of Webster in eastern Monroe County is the fastest growing municipality in the county. It had 14 major projects out of 123 major projects proposed in Monroe County in 2001. The town issued 227 building permits, which accounted for 16 percent of all permits issued in Monroe County that year. Townhouses and apartments comprised 57 percent of these permits (RG&E 2002d). Lot sizes for single family residences are a minimum of about 0.2 ha (0.5 ac), but the average size is 1.2 ha (3.0 ac) because of the lack of sewer systems. Recently, the town of Webster defeated a ballot measure that would have provided funds to preserve 1214 ha (3000 ac) as open space, although there is an ongoing effort to identify and retain farm

properties in agriculture using tax incentives with the purchase of development rights. The MCWA is planning to expand capacity on the east side of the county with a new intake line into Lake Ontario.[a]

The city of Rochester has declined in population over the last two decades, due to declining household size and movement to the suburbs. No restrictions on growth are in place in Rochester. The town of Webster, which is the town closest to Ginna in Monroe County, passed a comprehensive plan to control building zones and development in 1998; however, there are no growth control measures in place (RG&E 2002a).

2.2.8.4 Visual Aesthetics and Noise

Ginna is located in Wayne County just off the south shore of Lake Ontario. The Ginna site occupies an area of 197 ha (488 ac) and includes 0.6 km (1.5 mi) of shoreline. The topography of the site is either flat or gently rolling. The land in the area increases in elevation to the south, from about 78 m (255 ft) above mean sea level (msl) near the edge of the lake; to 134 m (440 ft) at Ridge Road about 5.6 km (3.5 mi) south of the plant; to 488 m (1600 ft) at the northern edge of the Appalachian Plateau, about 56 km (35 mi) to the south. Southward from NYS Route 104, the terrain progressively roughens, with a series of small abrupt hills commencing about 16 km (10 mi) south of the site (RG&E 2002a).

Surface-water features onsite include Mill Creek, which enters the site from the south, and Deer Creek, which enters the site from the west. Both creeks join southwest of the plant and empty into Lake Ontario just east of the plant. The general plant area is relatively well drained, with no topographic basins or swampy areas onsite. Approximately half of the site is leased and currently being used for agricultural production, primarily apple orchards and, to a lesser degree, corn and hay fields. Another quarter of the site has been left relatively undisturbed, having a combination of open fields, shrub brush, and trees. The remaining quarter of the site has been developed for the power station and ancillary facilities, with about 104 ha (256 ac) enclosed within the security fences (RG&E 2002a).

Approaching from the south on State Road 350, the Ginna site is not visible until approximately 1 km (0.6 mi) from the main entrance of the site. The view of the plant is fairly well blocked by woods and vegetation from the southwest and southeast. However, the transmission lines from the plant are visible from greater distances due to their elevation.

From Lake Ontario, the plant is visible from the north with limited visibility directly east and west. Many upscale homes have been built on Lake Ontario, but few are in sight of the plant. The

(a) Discussion with Gary Kleist, Commissioner of Public Works, Webster, New York (October 6, 2002).

lights from the plant, however, are noticeable to residents along the lake several miles from the plant, particularly in the winter when the light is reflected off snow on the ground. Noise from Ginna, at locations on the plant site, is barely noticeable except very close to the reactor containment building.

The immediate area around the site is rural. There are no substantial population centers, industrial complexes, airports, transportation arteries, or parks within a 4.8-km (3.0-mi) radius of Ginna, and the only recreational facility within this radius is the Bear Creek boat ramp, about 2.4 km (1.5 mi) from the site. The largest municipality within 16 km (10 mi) of Ginna is Webster, located in Monroe County, and approximately 11 km (7 mi) west-southwest of Ginna. Webster Park, a 223-ha (550-ac) Monroe County park on the south shore of Lake Ontario, is approximately 10 km (6 mi) west of the site. The nearest wildlife refuge is the Montezuma Wetlands Complex, located approximately 56 km (35 mi) from the Ginna site, in southeastern Wayne County. This complex is composed of 15,000 ha (36,000 ac) of marshes, forested wetlands, old fields, meadows, farm fields, and woodlands under Federal, State, and private control (RG&E 2002a).

2.2.8.5 Demography

- **Resident Population Within 80 km (50 mi)**

Population was estimated from the Ginna site out to 80 km (50 mi) in 16-km (10-mi) annular rings. An estimated 581,745 people live within 32 km (20 mi) of Ginna, and 1.25 million people live within 80 km (50 mi) (USCB 2000b). The largest population center within a portion of the 16-km (10-mi) area is Webster (town population 37,926 and village population of 5216) (USCB 2000b). Between 1990 and 2000, the Wayne County population grew by about 5 percent (which was the same growth rate as New York State during these years). The Monroe County population grew by about 3 percent.

- **Workforce**

The economy in Wayne County is much more closely linked to Ginna activities than Monroe County, as RG&E is one of the largest employers in Wayne County and pays more in property tax than any other single tax paying entity. The largest employer in Wayne County is the county government itself. In addition to the county and Ginna, most other larger employers are moderately sized manufacturing plants, including Garlock (manufacturing gaskets, seals, and rubber goods), Parker Hannifin Corporation (manufacturing refrigeration and air-conditioning products), and IEC Electronics (assembling electronic parts for computers) (WCEDC 1996). The Ames department stores were also a major employer in the area until their closure in 2002. This closure is expected to have a negative impact on the economy of Wayne County, not only

because of the loss of employment from its three stores, but also because it was one of the primary sources of sales tax revenue in the county. Wayne County has relatively few sources of sales tax revenue, as most of the larger retail centers are found in neighboring counties. The Wayne County economy is also struggling with the recent downsizing of IEC Electronics which went from 1300 employees in 1996 to approximately 200 in 2002.[a]

One factor that could potentially counter some of the negative impact from recent business closures and downsizing in Wayne County is its recent designation as an "Empire Zone" by the State of New York. The Empire Zone classification entitles the county to reduce certain State taxes on businesses that choose to site themselves in the county. The State also provides, as part of its Empire Zone program, a certain amount of funding to the county to attract new businesses to the area.[a]

Table 2-10 presents information on the major employment sectors and number of employees for Wayne and Monroe counties.

Table 2-10. Major Employment Sectors in Wayne and Monroe Counties in New York State (2000)

	Number of Employees	
Employment Sector	**Wayne**	**Monroe**
Services	15,280	150,960
Retail trade	7,400	60,380
Manufacturing	7,400	81,140
Agriculture	1,780	11,320
Construction	1,020	13,440
Other	13,860	43,930
Unemployed	2,560	16,230
Total jobs – full- and part-time	49,300	377,400

Source: RG&E 2002a

- **Transient Populations**

During the summer months, the lakeside population increases by about 500 people within a 8-km (5-mi) radius of the plant site and by about 4000 people within a 32-km (20-mi) radius.

(a) Discussion with Jim Armstrong, Wayne County Economic Development Corporation (November 4, 2002).

The nearest group of houses are summer cottages located 1.3 km (0.8 mi) west of the site. Other than the summertime residents of the area, there are no large groups of transients within 8 km (5 mi) of Ginna (RG&E 2002a).

- **Migrant Labor**

Migrant farm workers are individuals whose employment requires travel to harvest agricultural crops. These workers may or may not have a permanent residence. Some migrant workers may follow the harvesting of crops, particularly fruit, throughout the northeastern U.S. rural areas. Others may be permanent residents near Ginna who travel from farm to farm harvesting crops.

Migrant workers can be members of minority or low-income populations. Because they travel and can spend a significant amount of time in an area without being actual residents, migrant workers may be unavailable for counting by census takers. If uncounted, these workers would be “underrepresented” in U.S. Census Bureau (USCB) minority and low-income population counts (RG&E 2002a).

Wayne County does have a migrant labor population, with most of these workers arriving after May and staying through October, primarily for the apple-picking season. Approximately 115 farm-worker camps of five or more persons are scattered throughout Wayne County, with a total population of about 4400 workers. Information from Rural New York Farmworker Opportunities shows that there are about 12 camps with about 130 migrant workers located in the vicinity of the Ginna site (RG&E 2002a).

The majority of the migrant farm laborers in rural New York state come from Mexico and speak Spanish. In addition, there are several hundred Haitian workers, and other workers come from Jamaica, Puerto Rico, Guatemala, Honduras, and other countries in the Caribbean and Central America. There are also some African-American migrant workers who come to New York state from Florida.[a]

There are an estimated 1000 children of migrant workers, ranging in age from infants to 21, who qualify for the migrant education program in Wayne County. Some workers and their families are in the county for as long as 9 months, but the vast majority are present for a relatively short time (usually from the end of August until October). Also, there are some

---

(a) Cornell Migrant Program. Personal communications (e-mail) with Kay Embrey, Senior Extension Associate, Department of Human Development, College of Human Ecology, Cornell University, Alton, New York (October 30, 2002).

seasonal (as opposed to migratory) workers who live in Wayne County all year and work on the farms doing many of the same seasonal tasks as the migrant workers.[a]

2.2.8.6 Taxes

Property taxes are used to fund schools, police and fire protection, road maintenance, and other municipal services. Property taxes may be levied by counties, cities, towns, villages, school districts, and special districts. Ginna is located in the town of Ontario, Wayne County, and the Wayne Central School District. RG&E tax payments for Ginna to these jurisdictions are detailed in Table 2-11. Tax payments for Ginna averaged 13.2 percent of the total revenue collected and 37.2 percent of total property taxes for Ontario for the period from 1995 to 2001 (RG&E 2002a).[b] Ginna accounted for a smaller proportion of the Wayne County total revenue, an average of 2.0 percent of the total revenue and 6.4 percent of total property taxes for the same period. Ginna accounted for an average of 12.4 percent of the total revenue for the period 1995 through 1999 for the Wayne Central School District (RG&E 2002a).

Over time, tax payments from Ginna constitute a decreasing percentage of each taxing entity's revenues and budgets. RG&E expects this trend to continue into the future, and with respect to the town of Ontario and Wayne Central School District, this trend is approaching a level that is 10 percent or less of the taxing jurisdiction's total revenue. In an agreement with the three taxing jurisdictions, the assessed value of the facility will be reduced by $13 million per year through 2009. While this reduction does not directly translate to a percentage reduction in taxes, it does suggest that these levels will continue to decline, as shown in Table 2-11.

(a) Cornell Migrant Program. Personal communications (e-mail) with Kay Embrey, Senior Extension Associate, Department of Human Development, College of Human Ecology, Cornell University, Alton, New York (October 30, 2002).

(b) Tax payments for Ginna as a percentage of the town budget would be significantly higher than percentage of total revenue, as the total revenue includes fees collected for dedicated funds, such as the water fund and debt service. In 2001, the town of Ontario's budget for items supported by taxes totaled $3.9 million dollars. The total amount paid by RG&E for Ginna to the town was $700,000 or approximately 18 percent of the budget (Discussion with Richard Clark, Town of Ontario Supervisor, November 6, 2002.)

Table 2-11. Property Taxes Paid to the Town of Ontario, Wayne County, and Wayne Central School District in New York State by RG&E for R.E. Ginna Nuclear Power Plant

Year	Total Property Tax Revenues ($)	Property Tax Paid for Ginna Station ($)	Percent of Total Property Taxes	Total Revenue ($)	Percent of Total Revenue
WAYNE COUNTY					
1995	25,637,215	1,977,607	7.7	79,315,166	2.5
1996	26,040,581	1,767,004	6.8	80,650,726	2.2
1997	26,012,141	1,661,234	6.4	82,669,765	2.0
1998	25,923,815	1,599,601	6.2	84,526,663	1.9
1999	25,504,000	1,597,823	6.3	85,934,651	1.9
2000	26,911,005	1,634,372	6.1	88,697,549	1.8
2001	27,198,909	1,489,193	5.5	92,486,009	1.6
TOWN OF ONTARIO					
1995	1,489,983	720,503	48.5	4,868,418	14.8
1996	1,772,832	683,209	38.5	5,105,070	13.4
1997	1,984,839	731,959	36.9	5,413,726	13.5
1998	2,119,847	765,647	36.1	5,552,530	13.8
1999	2,174,857	764,523	35.2	5,923,504	12.9
2000	2,224,925	749,000	33.7	5,889,192	12.7
2001	2,225,607	704,898	31.7	6,182,603	11.4
WAYNE CENTRAL SCHOOL DISTRICT					
1995	NA	3,270,099	NA	23,865,546	13.7
1996	NA	3,172,118	NA	23,635,950	13.4
1997	NA	3,183,220	NA	24,964,558	12.8
1998	NA	3,165,620	NA	27,248,584	11.6
1999	NA	3,105,391	NA	28,927,432	10.7
2000	NA	3,170,478	NA	NA	NA
2001	NA	3,182,172	NA	NA	NA

Source: RG&E 2002a
NA = not applicable

There is relatively little tax revenue generation from sales tax in Wayne County due to the low number of retail centers in the county. The tax revenue generated by property taxes makes up a significant portion of the overall revenue generated by Wayne County and the town of

Ontario. Despite the fact that most property in the county is used for agricultural purposes, most of the property tax revenue comes from the residential sector (nearly 70 percent). The tax revenue generated by Ginna alone makes up about 6 percent of property tax revenues, while all other commercial properties generate approximately 10 percent of the property revenues for the county.[a]

2.2.9 Historic and Archaeological Resources

This section discusses the historic and archaeological background of the Ginna site and the surrounding area.

2.2.9.1 Historic and Archaeological Background

There is evidence that Native American populations lived and foraged in what is now Wayne County from at least 10,000 B.C. until they were displaced by Euro-American populations in the late eighteenth and early nineteenth centuries (Secor 1987). However, known archaeological sites are sparse in the area immediately south of Lake Ontario. In most periods, this area seems to have been used temporarily for hunting, gathering, and fishing. Larger, more permanent settlements tended to be located farther south.

Paleoindian hunters appear to have been attracted to the tundra and spruce woodland environment characteristic of the area by the presence of large game animals such as mammoth and bison. They preferred to make their hunting camps on well-drained hills or rises. The fluted chipped stone projectile points that mark this period have been found near Savannah in southeastern Wayne County (Secor 1987). By 8000 B.C., deciduous forests associated with smaller game had spread into the area around Lake Ontario. Early and Middle Archaic (7000 to 4000 B.C.) populations adapted to these new resources by taking a wider variety of game and by using a greater variety of smaller stone tools. By the end of the Middle Archaic (4000 B.C.), the area was part of the Lake-Forest biome and the associated Lake-Forest culture area. At this time, fishing and forest hunting and gathering provided the subsistence base for small, mobile bands. This more efficient exploitation of the environment allowed Archaic groups to remain in larger camps for longer periods of time (Funk 1978). By 3000 B.C., the area around Lake Ontario was home to essentially modern fauna. Archaeological sites from the period yield thick, parallel-sided projectile points and, by 3000 B.C., ground stone axes and adzes. During the Late Archaic Meadowood Phase (4000 to 1500 B.C.), small habitation sites with circular houses are found along sizable streams, suggesting the continuing dependence of small bands on fishing (Tuck 1978a).

(a) Discussion with Robert Diener, Director of Real Property Tax Service, Wayne County, New York (November 4, 2002).

The appearance of pottery at about 1000 B.C. marks the onset of the Early Woodland Period (1000 B.C. to A.D. 100). Experiments with plant domestication, greater sedentism, and larger settlements characterize this period. The typical Early Woodland settlement pattern is one of larger base settlements and dispersed smaller camps associated with the seasonal exploitation of specific resources. The evidence from Wayne County suggests small-scale hunting and fishing camps. Larger settlements were located farther south and to the west along the Genesee River (Versaggi 1999).

During the Middle Woodland Period (A.D. 100 to 1000), intensive hunting and fishing continued in the Lake-Forest Zone, with an emphasis on fishing. Horticulture based on maize, beans, and squash was introduced to the area by A.D. 1000 and was practiced along with foraging. The earliest horticultural villages that have been discovered still retain good access to streams and other water sources.

During the Late Woodland Period, the antecedents of the historical Iroquois tribes begin to emerge out of the Middle Woodland traditions. The Owasco phases begin around 1000 and the Iroquois phases begin around 1350. The Seneca appear to have developed in an area stretching from the Genesee River Valley to Seneca Lake that reaches north to Lake Ontario including Wayne County. Beginning with small, seasonally occupied campsites situated on knolls and terraces along the Genesee River, the increased reliance on horticulture led to the consolidation of settlement into larger, palisaded, hilltop hamlets after 1350 (Niemczycki 1984). These semi-sedentary villages included longhouse-like dwellings, thought to have provided communal shelter for extended, probably matrilineal families (Tuck 1978b), and cemeteries. Archaeological investigations along the Genesee River suggest a post-1450 settlement pattern composed of pairs of large agricultural villages located well south of the lake that changed location about every 20 years, associated with a large number of smaller special-use camps (Wray et al. 1991).

By 1550, five Iroquois nations, including the Seneca and their eastern neighbors the Cayuga, had formed a league or confederacy. After European contact, the Iroquois became increasingly dependent on European metal goods, which they obtained through trade for furs. After depleting the supply of beaver in their own lands, the Iroquois sought to control the fur trade passing through their lands. They actively resisted the activities of French fur traders along the Great Lakes, expanded their control over neighboring Native American groups, and sent war parties great distances to take captives and to maintain control of trade routes and trade (Abrams 1976). In 1687, the French reacted by burning the main Seneca villages. The Seneca sought refuge with the Cayuga and eventually established more dispersed communities closer to the Cayuga, east of the Genesee Valley and west of Canandaigua Lake, well inland from Lake Ontario (Niemczycki 1984).

The Iroquois' enmity with the French caused them to ally with the British, whom they supported in colonial conflicts. Initial agreements with British colonial governments recognized the claims of six Iroquois nations to northwestern Pennsylvania and western New York. Constant warfare with European powers and an influx of smallpox eventually diminished the Seneca population. During the American Revolution, the Iroquois were initially neutral, but eventually sided with the British. The colonies sent troops into western New York to subdue the Iroquois League. The Treaty of Fort Stanwix in 1784 acknowledged the American victory but reserved for the Iroquois much of western New York. About a third of the reserve, including the Wayne County area, was acquired by land speculators Oliver Phelps and Nathaniel Gorham in 1787, thus opening up the area to Euro-American settlement. By 1797, the Seneca had lost control of all but 11 relatively small parcels of their land. By 1802, when their lands had been further reduced, the Seneca had become increasingly Americanized. Longhouses no longer marked their settlements, and individuals began to own land. The number of Seneca in western New York further declined as a result of the Indian Removal Act of 1820, but a core population remained. Today, they own four reservations in New York state (Abrams 1976).

Euro-American settlement increased dramatically after the Revolutionary War. At the conclusion of the war, both Massachusetts and New York held territorial claims to western New York state. In a compromise settlement, Massachusetts relinquished claims to sovereignty over territory in exchange for the authority to sell the right to acquire land from the Iroquois. Phelps and Gorham purchased these rights for a large section of western New York. They had the land surveyed and divided into tracts for sale, and then sold their rights to this area to the Pultney of London Company in 1801 (Scully-Hill 1993). The first Euro-American settlers arrived in the Wayne County area in 1789. Finding the area thickly forested, they first settled along the lakeshore. Lake Ontario served as their main transportation route until the Erie Canal was built in 1823. The town of Ontario was formed in 1807, and Wayne County was formed in 1823.

Lakeshore property, such as that now occupied by Ginna, was the first to be settled and cleared. Although the area was eventually farmed, small-scale industry arose along the lake during the clearing process. Noah Fuller discovered a salt spring on Smoky Point, and salt production began there in 1810 (McIntosh 1975). With plenty of wood for fuel, brick kilns are said to have been located in the same vicinity, where bricks were produced for the Brick Church located on Ontario Center Road about a mile south of Ginna.[a] Hematite deposits that crop out south of the Ginna site between Lake Road and Ridge Road were first recognized in 1811. Surface mining and iron production were underway in the area by 1820. The first blast furnace was built in 1835. The large Furnaceville Iron Company furnace went into production in 1880.

(a) Personal communication (e-mail) with Ray Todd, Ontario Historical and Landmark Preservation Society, Ontario, New York (November 6, 2002).

This new large furnace triggered a mining boom. Ontario became a mining town and remained so until the end of World War I. The pits left from the mining activity filled with water and served as reservoirs until 1953. Hematite continued to be mined as pigment for a local paint mill until 1948 (Scully-Hill 1993). The transmission line right-of-way from Ginna appears to pass through the mining area before reaching Substation 204. After the decline of mining and iron production, Ontario returned to its rural character, which it retains today.

In the early part of the 20th century, during the Country Place Era of American architecture, the stretch of shoreline now occupied by Ginna attracted Rochester residents seeking a summer retreat. Beginning as early as 1907, at least 11 summer cottages, known as the Gates Grove Cottages, were built along the lakeshore on the western end of the Ginna property. The area is currently wooded, and three cottages remain. In 1913, Laura Ellwanger, daughter-in-law of prominent Rochester businessman and horticulturalist George Herman Ellwanger, purchased approximately 31 ha (77 ac), on which she built a summer residence called Brookwood. The estate included a Tudor Revival “manor house,” a carriage house, pool, extensive gardens, and other out-buildings.[a]

The Brookwood Estate, the neighboring Bailey Farm, and adjacent parcels were acquired by RG&E for the site of a nuclear power plant in 1958 (Hammer 1967). Ground was broken for Ginna (initially called Brookwood) in 1966. The plant was substantially completed in 1969 and became operational in 1970. Most of the structures constructed for the plant are located on the former Bailey Farm.

2.2.9.2 Historic and Archaeological Resources at Ginna Site

Ginna is currently located on a 197-ha (488-ac) parcel of land on the shores of Lake Ontario. Roughly a quarter of the land has been developed for the power plant itself and ancillary structures. About half the land is leased for agricultural use, and the remaining quarter has been left relatively undisturbed and consists of open fields, shrub-brush, and trees. Two streams, Deer Creek and Mill Creek, drain the area and empty into the lake just east of the plant. These resources are likely to have made this part of Wayne County attractive for human use in both prehistoric and historic times. While no archaeological sites have been recorded at Ginna, archaeological sites have been found along both creeks in relative proximity to the site. The New York State Historic Preservation Officer (SHPO) states that the Ginna property is located in an archaeologically sensitive area.[b]

(a) Personal communication (e-mail) with C. Howk, Landmark Society of Western New York, Rochester, New York (January 9, 2003).

(b) Personal communication (e-mail) with Nancy Todd, New York State Office of Parks, Recreation, and Historic Preservation, Waterford, New York (December 27, 2002).

Iroquoian Native American tribes were contacted by letter to determine the area's traditional cultural importance (see Appendix C). Of these, the Seneca Nation of New York responded. The Seneca consider the location and area of the Ginna site to be part of their traditional range and to be culturally highly sensitive (Mitchell and Maybee 2002).

During 1958, RG&E acquired 137 ha (388 ac) for the construction of Ginna. During planning and construction of the plant, care was taken to preserve the rural character of the area. The Brookwood Manor House, four original farm houses with barns located along Lake Road, and the Gates Grove Cottages were preserved. The SHPO considers the Brookwood Estate to embody the distinctive characteristics of the Country Place Era and to be eligible for inclusion in the National Register of Historic Places (NRHP). The four farms on Lake Road all appear on the 1858 plat of the area and were initially occupied by pioneer Ontario families. The Bailey Farm belonged to the Hodges family, which first arrived in Ontario in 1811, while the remaining farms came to be owned by the Gates family, who came to Ontario as early as 1816. The existing farm houses range in date from 1866 to 1920 (Kemmet 2002). In the opinion of the SHPO, the farms are not eligible for listing on the NRHP. The Gates Grove Cottages are not owned by RG&E, although it does own the property. These cottages are likewise not considered eligible for listing on the NRHP.[a]

There are two historic properties in the town of Ontario currently listed on the NRHP. Brick Church Corners, also known as Ontario Heritage Square, is a historic district located at the intersection of Brick Church and Ontario Center Roads about a mile south of Ginna, and just east of the transmission line right-of-way. This 121-ha (300-ac) district includes eight early- to mid-19th-century structures. The second is the First Presbyterian Church of Ontario Center located 4.8 km (3 mi) south of Ginna at 1638 Ridge Road in Ontario Center. It is noted for its period (1900 to 1924) Tudor Revival architecture. Three other historic sites, located between 1.6 to 3.2 km (1 to 2 mi) from Ginna, may be eligible for listing on the NRHP: the Albright School (SHPO A117-08-002), Bear Creek Harbor (SHPO A117-08-0026), and Furnaceville (SHPO A117-08-0028).[a] These sites are all associated with the development of the community of Ontario.

2.2.10 Related Federal Project Activities and Consultations

The staff reviewed the possibility that activities of other Federal agencies might impact the operation of Ginna during the license renewal term. Any such activities could result in cumulative environmental impacts and the possible need for the Federal agency to become a cooperating agency for preparation of the SEIS.

(a) Personal communication (letter) with Wayne Boyko, Rochester Museum and Science Center, Rochester, New York (January 13, 2003).

There are two major Federal projects planned for the region. In November 2001, the U.S. Congress approved funding for the Port of Rochester Harbor and Ferry Terminal Project, locally known as the "fast ferry." The Port of Rochester is located approximately 24 km (15 mi) west of the Ginna site. According to Congresswoman Louise Slaughter, who secured the funding in the U.S. House of Representatives, the monies will be spent for harbor and port construction and to pay for a portion of the terminal services for the ferry service and cruise and excursion services. Congress also approved spending money on the planned Center of Excellence in Photonics and Optoelectronics to be located in Rochester. The Center will combine Federal, State, and private monies and will focus on developing technology transfer and pilot fabrication facilities for imaging and communications devices that can be shared between Center partners (including Kodak, Xerox, Corning, the University of Rochester, and the Rochester Institute of Technology). There is also a Federally owned wildlife preserve discussed in Section 2.2.5.

After reviewing the Federal activities in the vicinity of the Ginna plant, the staff determined that there were no Federal project activities that would make it desirable for another Federal agency to become a cooperating agency for preparation of the SEIS.

NRC is required under Section 102 of National Environmental Policy Act of 1969 to consult with and obtain the comments of any Federal agency that has jurisdiction by law or special expertise with respect to any environmental impact involved. NRC consulted with the FWS. Consultation correspondence is included in Appendix E.

2.3 References

10 CFR Part 20. Code of Federal Regulations, Title 10, *Energy*, Part 20, "Standards for Protection Against Radiation."

10 CFR Part 50. Code of Federal Regulations, Title 10, *Energy*, Part 50, "Domestic Licensing of Production and Utilization Facilities."

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 52. Code of Federal Regulations, Title 10, *Energy*, Part 52, "Early Site Permits; Standard Design Certifications and Combined Licenses for Nuclear Power Plants."

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

10 CFR Part 61. Code of Federal Regulations, Title 10, *Energy*, Part 61, “Licensing Requirements for Land Disposal of Radioactive Waste.”

10 CFR Part 71. Code of Federal Regulations, Title 10, *Energy*, Part 71, “Packaging and Transportation of Radioactive Material.”

40 CFR Part 81. Code of Federal Regulations, Title 40, *Protection of Environment*, Part 81, “Designation of Areas for Air Quality Planning Purposes.”

40 CFR Part 190. Code of Federal Regulations, Title 40, *Protection of Environment*, Part 190, “Environmental Radiation Protection Standards for Nuclear Power Operations.”

Abrams, G. H. J. 1976. *The Seneca People.* Indian Tribal Series: Phoenix, Arizona.

American Nuclear Society (ANS). 1992. *Controlled Nuclear Chain Reaction: The First 50 Years.* American Nuclear Society, La Grange Park, Illinois.

City of Rochester. 2002. “Port of Rochester Request for Qualifications.” City of Rochester Economic Development Department. Accessed at http://www.cityofrochester.gov/edd/portrfq/pdf on January 6, 2003.

Clean Water Act. 33 USC 1251 et seq. (also known as the Federal Water Pollution Control Act [FWPCA] of 1977)

Cope, J. B. 1999. “Indiana Bat.” In Wilson, D. E. and S. Ruff, ed. *The Smithsonian Book of North American Mammals.* Smithsonian Institution Press, Washington, D.C.

Dames and Moore. 1971. *Terrestrial Biological Survey, Nuclear Power Plant Site and Environs, Ginna Nuclear Power Station.* Ontario, New York.

Elliott, D. L., C. G. Holladay, W. R. Barchet, H. P. Foote, and W. F. Sandusky. 1986. *Wind Energy Resource Atlas of the United States*. COE/CH 10093-4, U.S. Department of Energy, Washington, D.C.

Endangered Species Act. 16 USC 1531, et seq.

Funk, R. F. 1978. "Post-Pleistocene Adaptations." *Handbook of North American Indians, Vol. 15, Northeast.* Smithsonian Institution, edited by B. G. Trigger, Washington, D.C.

Genesee Finger Lakes Regional Planning Council (GFLRPC). 1997. "1997 County and Subcounty population Projections." Accessed at http://www.gflrpc.org/DTRCenter/1997.html on January 7, 2003.

Genesee Finger Lakes Regional Planning Council (GFLRPC). 2001. *Genesee Finger Lakes Regional Planning Council 2001 Annual Report*. Rochester, New York.

Hammer, S. 1967. *The RG&E Story, Vol. 2, The Ginna Years.* Christopher Press, Rochester, New York.

Hoyle, J. A., and T. Schaner. 2002. *Lake Ontario Offshore Benthic Fish Community*. In *Lake Ontario Management Unit 2001 Annual Report*. Lake Ontario Committee Meeting, Great Lakes Fishery Commission. Queen's Printer for Ontario, Toronto, Canada. Available at: http://www.glfc.org/lakecom/loc/mgmt_unit/index.html.

Humphrey, S. R. 1982. "Bats." *Wild Mammals of North America, Biology, Management, and Economics*, J. A. Chapman and G. A. Feldhamer, eds., Johns Hopkins University Press, Baltimore, Maryland.

Kemmet, K. 2002. "Real Estate–NRC Re-Licensing." Memorandum from Ken Kemmet (Rochester Gas and Electric Corporation, Rochester, New York) to G. Wrobel (Rochester Gas and Electric Corporation, Ontario, New York), November 15, 2002.

Kraft, C., and C. Carothers. 2002. The Lake Ontario Salmon Fishery. Cornell Cooperative Extension and NY Sea Grant, Department of Natural Resources, Cornell University. Itheca, New York. Available at: http://www.dnr.cornell.edu/ext/fish/salmon.html

McIntosh, W. H. 1975. *History of Wayne County, New York.* Dendron Press, Pultneyville, New York.

Mitchell, K. and L. Maybee. 2002. "Comments on 67 FR 63171–R.E. Ginna Nuclear Power Plant." E-mail from K. Mitchell and L. Maybee (Seneca Nation of New York, Irving, New York) to the U.S. Nuclear Regulatory Commission (Washington, D.C.), December 11, 2002.

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

New York State Department of Environmental Conservation (NYSDEC). 1998. *Indiana Bat Fact Sheet.* Accessed at http://www.dec.stagte.ny.us/weebsite/dfwmr/wildlife/endspec/inbafs.html on January 7, 2003.

New York State Department of Environmental Conservation (NYSDEC). 2001. Letter from NYSDEC to M.E. Dangler (RG&E) regarding hazardous waste compliance inspection. Avon, New York.

New York State Department of Environmental Conservation (NYSDEC). 2002. *New York Rare Plant Status List, May 2002*. Ed. by S. M. Young, New York Natural Heritage Program, Albany, New York.

New York State Department of Environmental Conservation (NYSDEC). 2003a. *List of Endangered, Threatened and Special Concern Fish and Wildlife Species of New York State*. New York Department of Environmental Conservation, Division of Fish, Wildlife and Marine Resources. Accessed at http://www.dec.state.ny.us/website/dfwmr/wildlife/endspec/etsclist.html on January 22, 2003.

New York State Department of Environmental Conservation (NYSDEC). 2003b. *New York State Breeding Bird Atlas Project 2000*. Accessed at http://www.dec.sgtate.ny.us/apps/bba/index.html on January 7, 2003.

New York State Department of Environmental Conservation (NYSDEC). 2003c. *New York State Amphibian and Reptile Atlas Project 1990–1999*. Accessed at http://www.dec.state.ny.us/website/dfwmr/wildlife/herp/ on January 7, 2003.

Niemczycki, M. A. P. 1984. *The Origin and Development of the Seneca and Cayuga Tribes of New York State.* Research Record No. 17, Research Division, Rochester Museum and Science Center, Rochester, New York.

Omernik, J. M. 1987. “Ecoregions of the Conterminous United States. Map (Scale 1:7500000).” *Annals of the Association of American Geographers*, 77(1): 118-125.

Ramsdell, J. V. and G. L. Andrews. 1986. *Tornado Climatology in the Contiguous United States*. NUREG/CR-4461, Nuclear Regulatory Commission, Washington, D.C.

Resource Conservation and Recovery Act of 1976 (RCRA). 42 USC 6901 et seq.

Rochester Gas and Electric Corporation (RG&E). 1972. R.E. Ginna Nuclear Power Plant Unit No. 1, Environmental Report, Vol. 1. Docket No. 50-244. Rochester, New York.

Rochester Gas and Electric Corporation (RG&E). 1977. *Ginna Nuclear Power Plant, 316(a) Demonstration Supplement*. NPDES Permit No. 070 02 2 000079 (NY 0000493), RG&E Report No. BP-13-043, Rochester, New York.

Rochester Gas and Electric Corporation (RG&E). 1995. *Electric Transmission Right-Of-Way Management Plan*. Rochester Gas and Electric Corporation, Rochester, New York.

Rochester Gas and Electric Corporation (RG&E). 2001a. R.E. Ginna Nuclear Power Plant, Updated Final Safety Analysis Report. Rev 16. April 2001. Rochester, New York.

Rochester Gas and Electric Corporation (RG&E). 2001b. *Annual Radioactive Effluent Release Report*, R.E. Ginna Nuclear Power Plant, Docket No. 50-244. Rochester, New York.

Rochester Gas and Electric Corporation (RG&E). 2001c. *The 2001 Hazardous Waste Regulatory Fee Information (form)* to New York State Department of Environmental Conservation, Division of Solid and Hazardous Materials. Rochester, New York.

Rochester Gas and Electric Corporation (RG&E). 2001d. *Annual Radiological Environmental Operating Report*, R.E. Ginna Nuclear Plant. Docket No. 50-244. Rochester, New York.

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

Rochester Gas and Electric Corporation (RG&E). 2002b. *R.E. Ginna Nuclear Power Plant: Offsite Dose Calculation Manual*. Revision 17. Rochester, New York.

Rochester Gas and Electric Corporation (RG&E). 2002c. *R.E. Ginna Nuclear Power Plant Application for Renewed Operating License, Appendix A – Updated Final Safety Analysis Report Supplement.* Rochester, New York.

Rochester Gas and Electric Corporation (RG&E). 2002d. Letter dated December 23, 2002, from R. C. McCready (RG&E) to R. Schaaf (NRC) submitting additional information following the site visit to the R.E. Ginna Nuclear Power Plant. Rochester, New York. (Accession No. ML030140009).

Schaner, T., J. N. Bowlby, M. E. Daniels, and B. F. Lantry. 2002. *Lake Ontario Offshore Pelagic Fish Community*. In *Lake Ontario Management Unit 2001 Annual Report*. Lake Ontario Committee Meeting, Great Lakes Fishery Commission. Queen's Printer for Ontario, Toronto, Canada. Available at http://www.glfc.org.lakecom/loc/mgmt_unit/index.html.

Scully-Hill, Virginia. 1993. *Ontario's History 1807-1993 as Preserved at Heritage Square, Ontario, New York.* Empire State Weeklies, Ontario, New York.

Secor, H. 1987. *Pre-history of the Savannah, New York Area 9000 B.C. to 1700 A.D.* Wayne County Historical Society, Lyons, New York.

Tuck, J. A. 1978a. "Regional Cultural Development: 3000–300 B.C." *Handbook of North American Indians, Vol. 15, Northeast.* Smithsonian Institution, edited by B. G. Trigger, Washington, D.C.

Tuck, J. A. 1978b. "Northern Iroquoian Prehistory." *Handbook of North American Indians, Vol. 15, Northeast.* Smithsonian Institution, edited by B. G. Trigger, Washington, D.C.

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

U.S. Census Bureau (USCB). 1990. U.S. Bureau of Census, 1990 Census of Population and Housing, Summary Tape file 1. Accessed at http://factfinder.census.gov on January 6, 2003.

U.S. Census Bureau (USCB). 1995. New York Population of Counties by Decennial Census: 1900 to 1990. Accessed at http://www.census.gov/population/cencounts/ny190090.txt on January 6, 2003.

U.S. Census Bureau (USCB). 2000a. U.S. Bureau of Census, Census 2000, Table DP-1. Profile of General Demographic characteristics. Accessed at http://www.census.gov/census2000/states/ny.html on April 9, 2003.

U.S. Census Bureau (USCB). 2000b. "Census 2000 Summary File 1 (SF-1) 100 Percent Data." Accessed at http://factfinder.census.gov/servlet/DatasetMainPageServlet on April 9, 2003.

U.S. Environmental Protection Agency (EPA). 2003a. *Green Book, Nonattainment Areas for Criteria Pollutants*. Accessed at http://www.epa.gov/oar/oaqps/greenbk/ on January 9, 2003.

U.S. Environmental Protection Agency (EPA). 2003b. *Number of Days with AQI Values Greater Than 100 at Trend Sites, 1991–2000, and All Sites in 2000*. Accessed at http://www.epa.gov/oar/aqtrnd00/pdffiles/aqiall.pdf on January 15, 2003.

U.S. Fish and Wildlife Service (FWS). 1989. "Endangered and Threatened Wildlife and Plants; Determination of Threatened Status for Eastern and Western Prairie Fringed Orchids." *Federal Register*, Vol. 54, 39857 - 39863, September 28, 1989.

U.S. Fish and Wildlife Service (FWS). 1994. "Endangered and Threatened Wildlife and Plants; Final Rule to Reclassify the Plant *Isotria medeoloides* (small whorled pogonia) from Endangered to Threatened." *Federal Register* Vol. 59, 50852 - 50857, October 6, 1994.

U.S. Fish and Wildlife Service (FWS). 2000. *Guidelines for Bog Turtle Surveys*. Pennsylvania Field Office, State College, Pennsylvania. August 30, 2000 Revision.

U.S. Fish and Wildlife Service (FWS). 2001. "Endangered and Threatened Wildlife and Plants; Final Determination of Critical Habitat for the Great Lakes Breeding Population of the Piping Plover." *Federal Register* Vol. 66, 22938-22969, May 7, 2001.

U.S. Fish and Wildlife Service (FWS). 2002. Letter from D. A. Stilwell (FWS) to P. M. Sawyko (RG&E). 25 February 2002.

U.S. National Atmospheric and Oceanic Administration (NOAA). 2002. *Climatology of the United States No. 81, Monthly Station Normals of Temperature, Precipitation, and Heating and Cooling Degree Days, 1971–2000, 30 New York (revision date February 2002)*. National Climatic Center, Asheville, North Carolina.

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.

Versaggi, N. M. 1999. "Regional Diversity within the Early Woodland of the Northeast." *Northeast Anthropology,* 57: 45-56.

Wayne County Economic Development Corporation (WCEDC). 1996. *Wayne County Strategic Economic Development Plan*. Prepared by Nutter Associates, Lyons, New York.

Wray, C. F., M. L. Sempowski, and L. P. Saunders. 1991. *Tram and Cameron: Two Early Contact Era Seneca Sites.* Research Record No. 21, Research Division, Rochester Museum and Science Center, Rochester, New York.