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## **Phase One Report – Assessment of Changes within the Emergency Planning Zone for Clinton Nuclear Generating Station**

*Prepared for:*  
Exelon Nuclear  
Warrenville, IL

*Prepared by:*  
Earth Tech, Inc.  
196 Baker Avenue  
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December 2003

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## 1 INTRODUCTION

Estimates of the time required to evacuate from areas around nuclear power plant sites are required for all operating plants in the United States. Federal guidance has been prepared to outline the format and content of these evacuation time estimates (NUREG-0654, Rev. 1<sup>1</sup> and NUREG/CR-4831<sup>2</sup>).

As the initial phase of a study to update the evacuation time estimates (ETEs) for the six nuclear generating stations in Exelon's Midwest Reactor Operating Group (MWROG), Earth Tech performed an assessment of changes that have occurred within the 10-mile Emergency Response Planning Zone (EPZ) surrounding each station, since the previous ETE study was performed. This initial assessment focused on factors that may affect the time estimates for the general population to evacuate from the EPZ. If few changes in conditions have occurred, the ETEs determined by the previous study may still be representative, and a full update study for that generating station may not be warranted. This report presents the results of the Phase 1 study for the Clinton Nuclear Generating Station.

Regulatory guidance concerning evacuation time estimates states "*the evacuation time estimates should be updated as local conditions change*"<sup>3</sup>. To assess whether the planning framework or conditions within the EPZ have changed to such a degree that previous ETEs are no longer a reliable basis for planning, four factors were reviewed for the Phase 1 study:

- changes in the definitions of the EPZ and Sub-area boundaries
- changes in the permanent resident population of the EPZ and Sub-areas
- changes to facilities in the EPZ (recreational, employers, hotels and motels, schools, hospitals, nursing homes)
- changes to major roadways within the EPZ

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<sup>1</sup> *Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants*, NUREG-0654, FEMA-REP-1, Rev. 1, U.S. Nuclear Regulatory Commission, Federal Emergency Management Agency, November, 1980.

<sup>2</sup> *State of the Art in Evacuation Time Estimate Studies for Nuclear Power Plants*, NUREG/CR-4831, T. E. Urbanik and J. D. Jamison, Pacific Northwest Laboratory, U.S. Nuclear Regulatory Commission, March, 1992.

<sup>3</sup> Appendix 4 of NUREG-0654, FEMA-REP-1, November 1980

## **2 CLINTON STATION OVERVIEW**

Clinton Station is located in Harp Township, DeWitt County, IL, adjacent to Clinton Lake. The EPZ for Clinton Station includes portions of DeWitt, Macon, McClean and Piatt Counties. The most recent ETE update study for Clinton Station was performed in 1993<sup>4</sup>.

### **2.1 Information Sources**

Information for the Phase I study was obtained from several sources, including the previous ETE update study, census 2000 population estimates compiled by the Illinois Department of Nuclear Safety (IDNS), current IDNS facility lists, current maps of each EPZ prepared by the Illinois Emergency Management Agency (IEMA), and discussions with county emergency response agencies for counties located in the EPZ.

### **2.2 EPZ Boundaries**

The EPZ and Sub-area boundaries for the Clinton EPZ are unchanged since the 1993 study. The EPZ is divided into eight (8) Sub-areas.

### **2.3 Roadway Network**

According to county agency officials, no significant changes in the EPZ roadway network have occurred since 1984, and no major construction projects are imminent.

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<sup>4</sup> *Evacuation Time Estimates for the Clinton Power Station Plume Exposure Pathway Emergency Planning Zone*, prepared by HMM Associates for Illinois Power Company, July 1993

### 3 PERMANENT RESIDENT POPULATION

The EPZ population determined for the 1993 ETE study, based on population data from the 1990 census, was 12,404. A new update study would be performed with data from the 2000 census. The EPZ population determined by IDNS, based on 2000 census data, is 13,268. (The IDNS population by Sub-area is provided in Appendix A.) This represents a population increase of 7 percent.

Table 3-1 shows the population change in individual Sub-areas for the Clinton EPZ. The largest population change occurred in Sub-area 6, Texas Township, located in the southwest corner of the EPZ, with a population increase of 589. Part of this difference reflects the treatment of Clinton City. According to the Sub-area definition in the 1993 report, Sub-area 7 includes all of "the incorporated area of the city of Clinton", including a small area located in Texas Township. The IDNS population value for 2000 for Sub-area 7, however, represents only the population of Clintonia Township; it appears that IDNS assigned the Texas Township portion of Clinton city to Sub-area 6. The population of Sub-areas 6 and 7 combined has increased by 434, a change of about 5 percent.

**Table 3-1. Change in Sub-area Populations for Clinton Station EPZ**

	2000 Population	1990 Population
Sub-area 1	1,662	1,441
Sub-area 2	248	233
Sub-area 3	512	429
Sub-area 4	243	200
Sub-area 5	265	207
Sub-area 6	1,371	782
Sub-area 7	7,926	8,081
(Sub-areas 6+7)	(9,297)	(8,863)
Sub-area 8	1,041	1,031
total EPZ	13,268	12,404



#### 4 SPECIAL FACILITIES

The facilities lists from the 1993 ETE update study for Clinton Station were compared to the current lists in county Emergency Response Plans. The current lists of facilities for the Clinton Station EPZ include 7 major employers, 9 recreational facilities, 9 schools, 2 day cares, 2 health care facilities, and 5 motels and miscellaneous facilities; a copy of the lists is provided in Appendix B. The comparison between the current and 1993 facilities lists shows a number of changes.

- In Sub-area 1, one recreational facility (South Shores Campground) has been added.
- In Sub-area 6, one employer (DFI) has been added, while two (Todd Industrial Uniform; National Environmental) were removed
- In Sub-area 7, two employers (Marko NPK; Human Resources, Inc.) were added and two (Clinton Imperial China; Revere Copper & Brass) were removed. One school (Clinton Christian Academy) was added, one nursery school (Creative Corners Nursery) was removed, and one health facility (Allen Court) was added.
- In Sub-area 8, two schools (Wapella Jr. and Sr. High School; Wapella Grade School) were removed.

These changes are consistent with a normal turnover in facilities over a ten-year interval, and do not reflect changes that would be likely to have a significant impact on evacuation time estimates. No major changes in the operations of existing facilities were identified in discussions with county agencies.

## **5 CONCLUSIONS**

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The definitions of the EPZ and Sub-areas have not changed since the last full ETE update study was performed in 1993. The changes in population, facilities, and the roadway network that have occurred within the EPZ for Clinton Station since the 1993 study are not likely to have any significant impact on the estimated evacuation times. The relatively low population residing in the EPZ has increased by only 864, an increase of 7 percent; major roadways have not changed; and no major changes to facilities have occurred. The evacuation times calculated in the 1993 are still representative of current conditions in the EPZ, and a full ETE update study is not warranted at this time.

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**APPENDIX A**

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**2000 POPULATION FOR CLINTON STATION EPZ (IDNS)**

General Information  
07/03

CLINTON NUCLEAR GENERATING STATION  
GENERAL INFORMATION

A. Site Information

The CLINTON NUCLEAR GENERATING STATION Unit 1 (CLINTON POWER STATION) is located approximately seven miles northeast of the CITY OF CLINTON in HARP TOWNSHIP, within DEWITT COUNTY, ILLINOIS. The majority of the CLINTON POWER STATION is located in the eastern half of DEWITT COUNTY with the arms of its man-made cooling reservoir (CLINTON LAKE) extending into the northeastern area of the county.

Land use within five miles is primarily agricultural with some rural residences. The 2000 permanent population within five miles of the CLINTON POWER STATION is 1,480. Between five and ten miles from the CLINTON POWER STATION lie three communities with a total 2000 population of 8,376. An additional 2,024 persons live in rural residences or on farmsteads for a projected total of 11,300 persons living between five and ten miles from the CLINTON POWER STATION.

Emergency Planning Zone

The EMERGENCY PLANNING ZONE (EPZ) for the CLINTON POWER STATION is an area approximately the area of a ten mile radius with the CLINTON POWER STATION as the center point. The EPZ extends approximately ten miles outward in all directions from the CLINTON POWER STATION for the plume exposure pathway planning zone and fifty miles outward for the ingestion exposure pathway planning zone. In the event of a serious accident at the CLINTON POWER STATION, the plume exposure EPZ will be the area in which intensive efforts will be made to notify and protect residents and transient population from exposure to radiation. This EPZ includes the following counties and municipalities:

DEWITT COUNTY

CLINTON  
WAPELLA  
WELDON  
DEWITT VILLAGE

MACON COUNTY

MCLEAN COUNTY

PIATT COUNTY

General Information  
07/03

The population distribution in the ten-mile EPZ surrounding the CLINTON POWER STATION is relatively low. Table 1 lists the population figures for those municipalities located in the EPZ, while Figure 1 shows the distribution of the total EPZ population in each of the sub-areas which comprise the EPZ.

Table 1

	<u>2000 Population</u>	<u>Miles From Site</u>	<u>Direction From Site</u>
CLINTON	7,485	7	West/WSW
WELDON	440	6	Southeast
WAPELLA	651	7	West/NW
DEWITT	<u>188</u>	3	East/NE
TOTAL	8,764		

Primary land use around the CLINTON POWER STATION is agricultural, with cash grain crops of corn and soybeans. The closest industries are located in the community of CLINTON.

Recreational facilities outside the municipalities include the CLINTON LAKE STATE RECREATION AREA and the WELDON SPRINGS STATE PARK. The park encompasses approximately 370 acres and contains a 28-acre lake with camping, fishing, and picnicking facilities. WELDON SPRINGS is one of the two sizeable lakes within ten miles of the site.

CLINTON LAKE is a 4,895 acre man-made cooling lake within the CLINTON POWER STATION property lines. Recreational facilities accommodate camping, boating, hunting, fishing, and hiking.

The nearest major highways are State Highways 54, 10, and 48, all of which cross the site. Other major thoroughfares are U.S. Highway 51, located about six miles west of the plant, and Interstate Highway 74, located about eleven miles northeast of the plant. The nearest railroad is the Illinois Central Gulf Railroad (ICG), which crosses the site east to west and comes within about 0.75 mile to the north of the reactor centerline. Another ICG track is located approximately 3.5 miles south of the station.

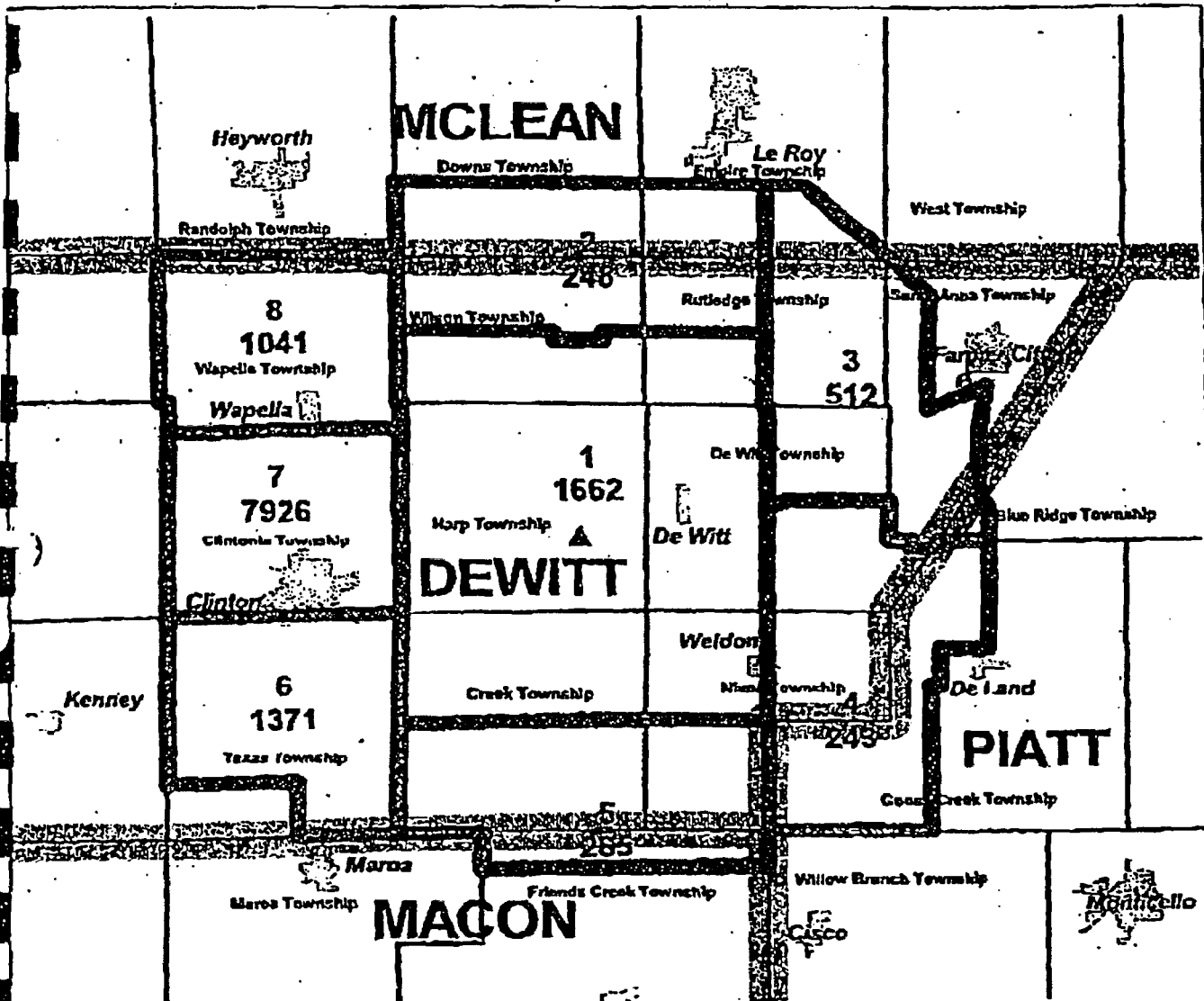
General Information  
04/03

# Figure 1

## Clinton Station EPZ

### 2000 Permanent Residential Population Figures

Total Population - 13,268



▲ Clinton Power Station

□ Township

▨ EPZ Sub-Area

▤ Municipality

▧ County Boundary

Sub-Area Number  
Population

**APPENDIX B**

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**CURRENT FACILITY LISTS**



*Clinton*

Attachment 5

CLINTON POWER STATION SPECIAL FACILITIES

<u>FACILITY, ADDRESS, PHONE #</u>	<u>FACILITY TYPE</u>	<u>RESPONSIBILITY</u>
<u>SUB-AREA 1</u>		
Clinton Lake State Recreation Area (Mascoutin) R.R. 1, Box 4 DeWitt, IL 61735 Site Superintendent 217/935-8722	Recreational	IDNR
Green Acres U.S. 10 Lane, IL 61750 Owner 217/935-9015	Recreational	DeWitt County
South Shores Campground U.S. 10 Lane, IL 61750 Manager 217/935 9032	Recreational	DeWitt County
<u>SUB-AREA 2</u>		
NONE		
<u>SUB-AREA 3</u>		
NONE		

DeWitt County  
07/01

<u>FACILITY, ADDRESS, PHONE #</u>	<u>FACILITY TYPE</u>	<u>RESPONSIBILITY</u>
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SUB-AREA 4

DeLand-Weldon Community Unit  
School District No. 57

High School 304 East IL Route 10 DeLand, IL 61839 Principal 217/736-2311	School	DeWitt County
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Elementary School 2311 North 300 East Road Weldon, IL 61862 Principal 217/736-2401	School	DeWitt County
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SUB-AREA 5

NONE

SUB-AREA 6

Arrowhead Acres R.R. 4 P.O. Box 272 Clinton, IL 61727 Owner 217/935-8442	Recreational	DeWitt County
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Clinton Country Club Rt. 51 South Clinton, IL 61727 Superintendent 217/935-2918	Recreational	DeWitt County
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Little Galilee Christian Assembly Church Camp R.R. 2 P.O. Box 265 Clinton, IL 61727 Camp Manager 217/935-3809	Recreational	DeWitt County
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DeWitt County  
07/01

<u>FACILITY, ADDRESS, PHONE #</u>	<u>FACILITY TYPE</u>	<u>RESPONSIBILITY</u>
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SUB-AREA 6 (continued)

BFI R.R. 4 Clinton, IL 61727 Plant Manager 217/935-5816	Industrial	DeWitt County
Weldon Springs State Park R.R. #2, Box 87 Clinton, IL 61727 Site Superintendent 217/935-2644	Recreational	IDNR

SUB-AREA 7

Action Technology Co. Rt. 10 East Clinton, IL 61727 Plant Manager 217/935-8311	Industrial	Clinton
Allen Court* 1650 E. Main Clinton, IL 61727 Team Leader 217/935-8830	Home for Developmentally Disabled	Clinton
Clinton Community Unit School District No. 15		
Senior High School Rt. 54 W Clinton, IL Principal 217/935-8337	School	Clinton
Junior High School 401 N. Center Clinton, IL Principal 217/935-2103	School	Clinton
Douglas Elementary School 905 E. Main Clinton, IL Principal 217/935-2987	School	Clinton

\* Regulated by Illinois Department of Public Health.

<u>FACILITY, ADDRESS, PHONE #</u>	<u>FACILITY TYPE</u>	<u>RESPONSIBILITY</u>
SUB-AREA 7 (continued)		
Lincoln Elementary School 407 S. Jackson Clinton, IL Principal 217/935-6772	School	Clinton
Washington Elementary School 411 N. Mulberry Clinton, IL Principal 217/935-6383	School	Clinton
Webster Elementary School 612 N. George Clinton, IL Principal 217/935-6218	School	Clinton
Crestview Healthcare Center* US Highway 51 North Clinton, IL 61727 Administrator 217/935-3826	Health Care	Clinton
Sunset Inn Route 51 and Township Road Clinton, IL 61727 Manager 217/935-4140	Motel	Clinton
DeWitt County Public Safety Complex 101 West Washington Clinton, IL 61727 County Sheriff 217/935-9507	Jail	DeWitt County
Human Resource Center East Route 10 East Clinton, IL 61727 Community Transition Service Manager 217/935-2218	Industrial	Clinton
Doctor John Warner Hospital* 422 W. White Street Clinton, IL 61727 Administrator 217/935-9571	Health Care	Clinton

\*. Regulated by Illinois Department of Public Health.

DeWitt County  
07/01

<u>FACILITY, ADDRESS, PHONE #</u>	<u>FACILITY TYPE</u>	<u>RESPONSIBILITY</u>
SOB-AREA 7 (continued)		
Maroon NPK 201 East Benton Clinton, IL 61727 Manager 217/935-2178	Industrial	Clinton
McElroy Metal Mill, Inc. Rt. 10 East Clinton, IL 61727 Plant Manager 217/935-9421	Industrial	Clinton
Miller Container Corp. Rt. 10 East Clinton, IL 61727 Plant Manager 217/935-8361	Industrial	Clinton
Thrall Manufacturing Company N. Rt. 51 Clinton, IL 61727 Plant Manager 217/935-9541	Industrial	DeWitt County
Tiny Tot Day Care 801 S. Mulberry Clinton, IL Director 217/935-3504	Day Care Center/ Pre-School	Clinton
Town & County Motel Rt. 54 West Clinton, IL 61727 Manager 217/935-2121	Motel	Clinton
Wallace Computer Services, Inc. South Clinton Clinton, IL 61727 Plant Manager 217/935-2113	Industrial	Clinton
Wye Motel Rt. 54 East Clinton, IL 61727 Director 217/935-3373	Motel	Clinton

DeWitt County  
07/01

<u>FACILITY, ADDRESS, PHONE #</u>	<u>FACILITY TYPE</u>	<u>RESPONSIBILITY</u>
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SUB-AREA 7 (continued)

YMCA 417 S. Alexander Clinton, IL 61727 Executive Director 217/935-6307	Recreational	Clinton
Head Start 514 N. Monroe Clinton, IL Director 217/935-4429	Pre-School	Clinton
Clinton Christian Academy 801 S. Mulberry Clinton, IL Administrator 217/935-9414	School	Clinton

SUB-AREA 8

Calvary United Pentecostal Church Camp US 51 P.O. Box 98 Wapella, IL 61777 Camp Caretaker 309/473-3028	Recreational	DeWitt County
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