

2.0 SITE CHARACTERISTICS

2.1 GEOGRAPHY AND DEMOGRAPHY

2.1.1 SITE LOCATION AND DESCRIPTION

2.1.1.1 Specification of Location

The Waterford 3 site is located on the west (right descending) bank of the Mississippi River between Baton Rouge, Louisiana, and New Orleans, Louisiana. The site is in the northwestern section of St. Charles Parish, Louisiana, near the towns of Killona and Taft. Figure 2.1-1 shows the site in relation to the region within 50 miles; Figure 2.1-2 shows the area within five miles of the site.

The geographic coordinates for the Waterford 3 reactor are Latitude 29° 59' 42" North, and Longitude 90° 28' 16" West. Based on the Universal Transverse Mercator (UTM) Zone 15, the UTM coordinates are 3,320,744 meters northing, and 743,963 meters easting.

The Waterford site is located adjacent to the Mississippi River, at River Mile 129.6. The River itself is the most prominent natural feature of the region. Other important natural features include Lac des Allemands, about 5.5 miles southwest of the site, and Lake Pontchartrain, about seven miles northeast of the site. The land slopes gently from its high points near the River (+10 to 15 ft. MSL) to extensive wetlands located about 1.5 to 2.5 miles inland from the River.

→(DRN 01-364, LBDCR 14-023, R308)

Most of the man-made features are located on the narrow strip of dry land between the Mississippi River and the wetlands. Near the Waterford site are several large industrial facilities, including Waterford SES Units 1 and 2 (0.4 mile west-northwest of Waterford 3), little Gypsy SES Units 1, 2 and 3 (0.8 mile north northeast of the site, across the River), Mosaic (formerly IMC Agrico), a fertilizer manufacturer (0-6 mile east-southeast) and Occidental Chemical Corporation (formerly Hooker Chemical Company) (0.8 mile east-southeast). Entergy owns and operates the above mentioned generating stations. Other large industries are located along the Mississippi River both north and south of the site as far as Baton Rouge and New Orleans. These industries are predominantly refineries, petrochemicals manufacturers, sugar manufacturers, and grain elevators.

←(LBDCR 14-023, R308)

Transportation facilities near the Waterford site include the Mississippi River (0.2 mile from the site),

Louisiana Highway 18 (0.1 mile north-northeast), Louisiana Highway 3127 (1.1 miles south-southwest), Louisiana Highway 628 (0.7 mile north-northeast, across the River) and the Union Pacific Railroad (0.5 mile south-southwest).

Important urban centers in the region of the site include New Orleans (25 miles east-southeast) and Baton Rouge (50 miles west-northwest). Communities near the site include Killona (0.9 mile west-northwest), Montz (1.0 mile north), Norco (3.5 miles east), Hahnville (3.7 miles east southeast), and Laplace (4.7 miles north). All of the communities near the site except Laplace are located in St. Charles Parish. Laplace is located in St. John the Baptist Parish. The Waterford site is located approximately three miles southeast of the St. John the Baptist Parish boundary.

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Other prominent man-made features include the Mississippi River levee system, which at its closest point is 0.1 mile from the Waterford site, and the Bonnet Carre Spillway, a flood control structure 1.3 miles east-northeast of the site.

2.1.1.2 Site Area Map

→(DRN 01-364)

The Waterford property is shown on Figure 2.1-2. The property is owned by Entergy and includes 3,561.3 acres. The plant area itself covers 40.1 acres. The Waterford plant area is defined as including the fenced area immediately adjacent to Waterford 3. This site area is shown, along with principal station structures and nearby features, on Figure 2.1-3. The site area includes only station structures for Waterford 3, and does not include any residential, recreational, or other industrial structures. There are no visitors' center or other recreational facilities within the site area. There is an Energy Education Center, which is made up of the Visitor's Center, Training Facility and Emergency Operations Facility, and a Baseball Diamond for company functions located on Entergy property adjacent to Highway 3127.

←(DRN 01-364)

The exclusion area and low population zone are shown on Figure 2.1-2. The radius of the exclusion area from the center of the reactor is 914 meters (about 3000 ft.-). The low population zone includes that area within approximately two miles (3300 meters) of the reactor.

→(DRN 01-364)

2.1.1.3 Boundaries for Establishing Effluent Release Limits

←(DRN 01-364)

→(DRN 06-624, R15)

The restricted area, defined for the purpose of controlling access and egress to and from the site, coincides with the plant security fence. Access and egress to the restricted area is controlled by a security organization on the site. Authority to enter the area is given to plant personnel, authorized contractor personnel, and authorized visitors only. Before entry is authorized to a new employee or visitor such a person may be subject to radiological safety training, and may be issued a DLR (dosimeter of legal record) badge for recording-personal-exposure to radiation. Unauthorized access is prevented by physical barriers, closed-circuit TV cameras, security force patrols, intrusion detection equipment, and access control. These measures are described in greater detail in Section 13.6 and the Security Plan which is submitted under separate cover. Radiation monitors are also located at the exit to the plant-protected area for radiation protection purposes at egress from the area.

←(DRN 06-624, R15)

→(DRN 03-2055, R14)

For the purpose of establishing effluent release limits in accordance with 10CFR20 and Appendix I to 10CFR50, the concept of the restricted area, as defined above for the purpose of access and egress control is not applicable. The effluent release limits are established in order to ensure that (1) the concentration of the radionuclides in gaseous effluent at the point of discharge from the plant stack and exhaust systems do not exceed the effluent concentration limits set forth in Table 2, Column 1 of Appendix B to 10CFR20 (2) the concentration of radionuclides in liquid effluent at the point of discharge from the circulating water discharge structure do not exceed ten times the effluent concentration limits set forth in Table 2, Column 2 of Appendix B to 10CFR20 and (3) the cumulative liquid and gaseous radionuclide releases do not result in exposures to individuals outside the site boundary in excess of the limits set forth Appendix I to 10CFR50.

←(DRN 03-2055, R14)

Radioactive effluent release points and nearest distances to the boundary line are shown in Figure 2.1-4. As discussed in Subsection 11.2.4, the primary liquid radioactive waste release

point is the circulating water discharge canal. The concentration of effluents in this discharge will be well below the 10CFR20 limits as shown in Table 11.2-13.

→ (DRN 01-1282)

Gaseous radioactive effluent releases to the atmosphere are located at the plant stack and the Turbine Building ventilation exhaust. The Main Condenser Evacuation System exhaust and the Turbine Gland Seal System exhaust are not normally radioactive, with the release point being as indicated in Figure 2.1-4. However, as described in Subsection 10.4.2, an alternate release point for the Turbine Gland Seal System exhaust is the plant stack. As discussed in Sections 11.3 and 12.2, the radioactive releases listed here are lower than the limits set forth in 10CFR20.

← (DRN 01-1282)

2.1.2 EXCLUSION AREA AUTHORITY AND CONTROL

2.1.2.1 Authority

→ (DRN 01-364)

Entergy will have full control of all activities conducted within the exclusion area boundary of the Waterford 3 site. All of the property within the designated exclusion area is owned by the licensee with the exception of the bottom lands below the mean low water of the Mississippi River.

Entergy owns, in title, all surface rights within the exclusion area boundary of the plant. There is presently no intention to allow exploration for subsurface minerals from points on the surface of the exclusion area.

Entergy is the fee owner of the lands immediately adjoining the exclusion zone for Waterford 3. Entergy is the full or partial owner of the mineral rights on such property. Entergy has no intention of executing mineral leases for drilling on this property, however, if this were contemplated, a condition of the lease agreement would be a restriction prohibiting directional drilling into the subsurface below the exclusion zone.

If drilling for minerals is contemplated on adjoining lands held by other ownership, Entergy would be included in the drilling unit(s) as a Lessee with the right to require directional drilling restrictions in mineral leases.

The Mississippi River, Louisiana Highway 18, the Union Pacific Railroad right-of-way, and the west (right descending) bank levee of the Mississippi River constitute traversals of the site exclusion area as allowed by 10CFR100.3 (a). Refer to the Waterford 3 Emergency Plan Implementing Document for the arrangements which have been made to give Entergy authority and control over these traversals.

← (DRN 01-364)

2.1.2.2 Control of Activities Unrelated to Plant Operations

→ (DRN 01-364)

In addition to Waterford 3, there are two fossil-fueled units, Waterford SES Units 1 and 2, which are owned by Entergy and which are within the site exclusion area. The plant staff for these two units consists of about 30 people. Since this includes workers assigned to shifts, it is a conservative estimate of the maximum number of fossil plant personnel that would be within the exclusion area at any given time. Evacuation procedures for Waterford SES Units 1 and 2 are described in the Waterford 3 Emergency Plan Implementing Document.

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As a portion of the site exclusion area to the south, southeast, southwest, and northwest of the Waterford 3 nuclear plant island structure may continue to be used for agricultural

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purposes, it is possible that 50-60 farm workers will be on the site at various times. Evacuation procedures for these farm workers are described in the Waterford 3 Emergency Plan Implementing Document.

Fishing in the Mississippi River from the batture is an occasional practice in the Waterford area. An estimated maximum of 10 people may be engaged in this activity within the exclusion area at any given time. Evacuation procedures for these persons from the batture are described in the Waterford 3 Emergency Plan Implementing Document.

Texaco maintains a gas valve station east-southeast of the Waterford 3 nuclear plant island structure just within the radius of the exclusion area. This valve station is automated and requires only periodic monthly maintenance involving, typically, two persons. Evacuation procedures for these maintenance workers are described in the Waterford 3 Emergency Plan Implementing Document.

2.1.2.3 Arrangements For Traffic Control

The site exclusion area is traversed on the northeast side by the Mississippi River and State Highway 18 and on the southwest by the Union Pacific Railroad. The Mississippi River traverses the exclusion area approximately 900 ft. from the Reactor Building. State Highway 18, which parallels the Mississippi River, traverses the exclusion area approximately 500 ft. from the Reactor Building. The Union Pacific railroad traverses the exclusion area approximately 2,700 ft. from the Reactor Building. These traffic traverses are not a factor in the normal operation of the plant.

In the event of an emergency, all traffic traversing the exclusion area is subject to control. Detailed information concerning the arrangements for control of traffic within the exclusion area are described in the Emergency Plan Implementing Document.

2.1.2.4 Abandonment or Relocation of Roads

There are no public roads subject to abandonment as a result of the construction of Waterford 3.

A section of State Highway 18, which traverses the site exclusion area, was relocated to facilitate the construction of the Circulating Water System. This section, which is approximately 3,000 ft. long, was relocated a maximum distance of approximately 40 ft. to the southwest of the original location.

The required relocation permits were obtained from the State of Louisiana Department of Highways.

2.1.3 POPULATION DISTRIBUTION*

Existing and projected populations by annular sectors are found on Table 2.1-1, which shows the population within 10 miles of Waterford 3 and the population between 10 and 50 miles from the plant. Population was estimated for 1977, and then projected for the years, 1980, 1981 (plant start-up date), 1990, 2000, 2010, 2020, and 2030. The methodologies for estimating and projecting population are described in Subsection 2.1.3.7.

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2.1.3.1

Population Within 10 Miles

Figures 2.1-5 through 2.1-12 show the distribution of present and projected population within 10 miles of Waterford 3. The estimated 1977 population within 10 miles of the plant is 50,970 persons, concentrated mainly in towns along the banks of the Mississippi River. The area within 10 miles of the plant includes St. Charles and St. John the Baptist Parishes. St. Charles Parish has an estimated 1977 population of 34,125 persons, while St. John the Baptist Parish's 1977 population is 26,026.

a) Towns Within 10 Miles

Table 2.1-2 shows towns with populations over 1000 persons within 10 miles of the plant. The closest town to Waterford 3 is Killona, 0.9 miles west-northwest. Killona has an estimated 1977 population of 1,203 persons. Other towns near the plant include Norco (1977 population 5,236), 1.9 miles east, Hahnville (1977 population 2,655), 3.7 miles east-southeast, and Laplace (1977 population 6,521) 4.7 miles north. The largest town within 10 miles of the plant is Reserve (1977 population 6,990), six miles to the northwest. Other towns within 10 miles include Luling (1977 population 3,700), seven miles southeast of the plant, Mimosa Park (1977 population 1,877), nine miles southeast, St. Rose (1977 population 2,432), nine miles east-southeast, and Garyville (1977 population 2,710), nine miles west-northwest. There are also many smaller settlements and individual homes along both banks of the River. The nearest such place to Waterford 3 is Montz, one mile north of the plant on the east (left descending) bank of the Mississippi River. The locations of the above towns and settlements are shown in Figures 2.1-2 and 2.1-13.

b) Population by Annular Sectors

The most heavily populated annular sectors within 10 miles of the plant are those which cover the above named towns. The most populous annular sector is east-southeast (ESE) 5-10 (1977 population 7,350), which includes St. Rose, part of Luling and the riverbank settlements of Destrehan and St. Rose.

* The population information in the Emergency Plan is updated as new 10-year census data becomes available. The data in this FSAR Section provided population estimates as required for obtaining an operating license. This is now historical population data and is no longer required to be updated.

c) Population by Annuli

The area within five miles of the plant is somewhat more densely populated than the 5-10 mile annulus, primarily because the 0-5 mile area includes a higher ratio of usable land to wetlands than does the 5-10 mile annulus. The population density within five miles of the plant is 224.9 persons per square mile (1977 population 17,268) compared with a density of 143 persons per square mile in the 5-to-10 mile annulus (1977 population 33,702).

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The area within two miles of the plant is considerably less densely populated than the 3-5 mile annulus. The 0-2 mile annulus has a total 1977 population density of 141.1 persons per square mile (1977 population 1,774), while the 3-5 mile annulus has a total 1977 density of 234.9 persons per square mile (1977 population 15,494). The inner area consists mostly of Entergy property and industrial users, with settled areas only at Killona and Montz. The outer area, between three and five miles from the plant, includes the towns of Norco and Hahnville, parts of Laplace, and settlements at Good Hope, New Sarpy, Gypsy and Lucy.

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d) Population by Sectors

The most populous sectors within 10 miles of the plant are east-southeast (ESE), northwest (NW), and north (N). The ESE direction includes Hahnville, part of Luling, St. Rose, Destrehan, parts of New Sarpy and numerous smaller settled areas along the Mississippi River. The NW direction includes Killona, Edgard and Reserve. The N sector includes Montz and Laplace.

e) Projected Population

Population within 10 miles of Waterford 3 is expected to more than double during the life of the plant from 50,970 persons in 1977 to 109,396 persons in 2030. The area should grow more rapidly in its eastern portion, closer to New Orleans. In the eastern part of the study area, St. Charles Parish is expected to grow from its 1977 population of 34,125 persons to 84,286 by 2030, a 147 percent increase. This amounts to a 1.8-percent annual growth rate. To the west, St. John the Baptist Parish's population is projected to increase from 26,086 in 1977 to 46,564 in 2030, which is a 78.5 percent increase, or 1.1 percent per year growth rate. The principal growth influences within 10 miles of the plant are expected to be the spread of population outward from the New Orleans area and the completion in 1981 of a new regional highway network, including I-310 from I-10 to Luling, and Louisiana Highway 3127 from Killona westward⁽¹⁾ ⁽²⁾ ⁽³⁾. The resulting improvement in accessibility of the Lucy-Edgard-Wallace area, the Hahnville-Luling Mimosa Park area, and the Destrehan-St. Rose area should bring significant growth pressure to bear on those towns and nearby land. Examples of expected growth are the NW 3-4 annular sector near Edgard and Lucy, with no population in 1977 and a projected 2030 population of 1405 persons; the SE 4-5 annular sector between Hahnville and Luling, with a 1977 population of 429 and a projected population of 3062 in 2030; and the ESE 5-10 annular sector including St. Rose and Destrehan, with a population of 7,350 in 1977 and an expected 2030 population of 18,155. These three annular sectors are directly in the path of the above mentioned highway improvements.

The population growth rates of the area between two and 10 miles from the plant are expected to be somewhat higher than statewide or national growth rates, while within two miles of the plant, the growth rate should be lower. Population increases in Louisiana are expected to average 0.8 percent per year from 1975 to 2000,⁽⁴⁾ and in the U.S. the average growth between 1977 and 2000 is expected to be 1.2 percent per year⁽⁵⁾⁽⁶⁾. Population within two miles of the plant is

expected to grow from 1,774 persons in 1977 to 2,317 persons in 2030. This as an increase of only 30.6 percent over 52 years, or 0.5 percent per year. The 3-5 mile annulus, however, is expected to grow from 15,494 persons in 1977 to 36,384 in 2030, a 134.8 percent increase, amounting to 1.7 percent per year. The 5-10 mile annulus is projected to grow from a population of 33,702 in 1977 to 70,695 in 2030, an increase of 109.8 percent, or 1.4 percent per year.

Further information on expected growth and development within five miles of Waterford 3 is contained in Subsection 2.1.3.4.

2.1.3.2 Population Between 10 and 50 Miles

Figure 2.1-14 shows the distribution of present population in the area between 10 and 50 miles from Waterford 3. The estimated 1977 population between 10 and 50 miles from the plant is 1,592,676 persons, which amounts to 96.9 percent of the 1,643,646 persons within 50 miles of the plant. The bulk of this population is concentrated in an around New Orleans, the region's major city. The New Orleans Standard Metropolitan Statistical Area (SMSA), consisting of Jefferson, Orleans, St. Bernard and St. Tammany Parishes, has an estimated 1977 population of 1,131,472 or 68.1 percent of the total population within 50 miles of the plant. East Baton Rouge Parish, which includes the state capitol city of Baton Rouge, has an estimated 1977 population of 321,647 (much of East Baton Rouge Parish lies outside the 50 mile annulus).

Population within the region's remaining 17 parishes consists of towns and settlements along the natural levees of rivers flowing through the Mississippi delta, and along the land transportation routes of the upland parishes north and west of Lake Pontchartrain.

a) Cities and Towns Within 50 Miles

Table 2.1-3 lists towns with a 1977 population of over 10,000 persons within 50 miles of Waterford 3. The largest, of course, is New Orleans (1977 population 562,560), followed by Baton Rouge (1977 population 187,194). Jefferson Parish, immediately to the west of New Orleans, includes several major cities, towns and communities the largest of which are Metairie (1977 population 137,438), Kenner (1977 population 38,524), Marrero (1977 population 37,436) and Gretna (1977 population 32,093). Slidell, the major city in St. Tammany Parish immediately north of New Orleans, has an estimated 1977 population of 19,586 persons. Other important regional cities not in the New Orleans or Baton Rouge areas include Houma (1977 population 34,522) in Terrebonne Parish, Morgan City (1977 population 18,527) in St. Mary Parish, and Thibodaux (1977 population 16,342) in Lafourche Parish. The locations of the above cities are shown on Figure 2.1-14.

b) Population by Annular Sectors

The most heavily populated annular sectors in the area between 10 and 50 miles from Waterford 3 are those which cover the major population centers. The E 20-30 annular sector contains most of the city of New Orleans. The annular sector's 1977 population is estimated at 555,731. The two next largest annular sectors cover areas adjacent to New Orleans: E 10-20 (Jefferson and St. Charles Parishes) has a 1977

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population of 215,564 persons, and ESE 20-30 (Orleans and Jefferson Parishes) has 170,248. These three annular sectors alone account for 59.1 percent of the population between 10 and 50 miles from the plant. The next most populous annular sector is NW 40-50, with 86,743 persons. This annular sector covers the Baton Rouge area.

c) Population by Annuli

The most densely populated annulus is that between 20 and 30 miles from the plant, with an estimated 1977 population of 812,017 persons, which amounts to 516.9 people per square mile. This annulus covers New Orleans and areas north and south of that city. The 10-20 mile annulus has a population density of 301.1 persons per square mile (1977 population 283,823). This annulus includes a large part of Jefferson Parish. The outer annuli (30-40 miles and 40-50 miles from the plant) are considerably less densely populated because they include large areas of wetlands, and rural areas. The 30-40 mile annulus has a 1977 population density of 125.8 persons per square mile (1977 population 276,593), while the 40-50 mile annulus has a density of only 77.9 people per square mile (1977 population 220,242).

d) Population by Sectors

The most populous sectors between 10 and 50 miles from the plant are also those which cover the New Orleans area. Sectors E and ESE have estimated 1977 populations of 828,672 and 220,437 respectively, and densities of 1758.5 persons per square mile, and 467.8 persons per square mile. Sector NW, extending to Baton Rouge has a 1977 population of 101,866, and a density of 216.2 persons per square mile.

e) Projected Population

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Figures 2.1-15 through 21 show the projected resident population within 50 miles of Waterford 3. Population between 10 and 50 miles from Waterford 3 is expected to grow by 76.4 percent between 1977 and 2030, or from 1,592,675 in 1977 to 2,809,833 in 2030. That translates into a 1.1 percent annual growth rate, compared to 0.8 percent for Louisiana (1975 to 2000)⁽⁴⁾ and 1.2 percent for the U.S. (1977 to 2000)⁽⁵⁾⁽⁶⁾. The principal area of growth is expected to include the parishes near New Orleans, especially St. Tammany Parish, which is the nearest upland area to the city. Any expansion of the New Orleans area without further impact on wetland areas would have to take place in St. Tammany Parish⁽⁷⁾. St. Tammany Parish is expected to grow from 77,348 persons in 1977 to 265,505 in 2030, an increase of 231.6 percent, or 2.3 percent per year. Other parishes near New Orleans, including Jefferson, St. Bernard and St. Charles (partly within 10 miles of the plant) should also experience considerable growth from 1977 to 2030, ranging from 138 percent for St. Bernard (1.7 percent annual growth rate) to 155.4 percent for Jefferson (1.8 percent annual growth rate). However, Orleans Parish, which consists entirely of the City of New Orleans, is expected to decline in population from 562,560 in 1970 to 502,823 in 2030. Other regional parishes expecting rapid growth include Ascension and Livingston Parishes, both within the area of influence of Baton Rouge. Ascension Parish lies along the Mississippi River southeast of Baton Rouge. Its population is expected to grow from 43,104 in 1977 to 115,740 in 2030, an increase of 169.5 percent (1.9 percent per year). Livingston Parish is an upland parish east of Baton Rouge. Its expected

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population growth is from 44,056 in 1977 to 127,527 in 2030, an increase of 189.5 percent (2.1 percent per year).

In addition to population growth surrounding the major metropolitan areas the region's medium-sized cities can expect continued growth⁽⁴⁾. In eastern sections, settlements should continue to locate along the waterways, until there is essentially linear development. As the land bordering the principal highways and waterways becomes completely settled, expansion should proceed into the agricultural land of the natural levees. This type of development is taking place in Houma and Thibodaux, and along the Mississippi River⁽⁷⁾. The Houma area including Bayou Cane, is rapidly assuming regional importance⁽⁷⁾. Terrebonne Parish, in which Houma is located, is expected to grow from a population of 84,564 in 1977 to 143,403 in 2030, a 69.6 percent increase (1.0 percent per year). Lafourche Parish, which contains Thibodaux and other rapidly growing communities along Bayou Lafourche, is expected to increase from 74,240 persons in 1977 to 107,075 in 2030, a 44.2 percent increase (0.7 percent per year). Growth is also expected in the Mississippi River parishes of East Baton Rouge (1.1 percent per year), St. John the Baptist Parish (1.1 percent per year) and Plaquemines Parish (0.8 percent per year).

The annular sectors expected to experience the most rapid growth are those covering the fastest growing areas outlined above. The ENE 40-50 annular sector, covering the Slidell area of St. Tammany Parish, is expected to grow from a population of 31,012 in 1977 to 102,844 in 2030, an increase of 231.6 percent (2.3 percent per year). The annular sectors near New Orleans should also have rapid growth rates: E 10-20 is expected to grow by 1.8 percent per year, while ESE 20-30 should experience a 1.5 percent annual growth rate.

The most rapidly growing annulus should be that between 10 and 20 miles from the plant. A large portion of this annulus includes parts of St. Charles and Jefferson Parishes, two of the fastest growing areas. This annulus is expected to grow from a population of 283,823 in 1977 to 735,166 in 2030, a 159 percent increase (1.8 percent per year). The 20-30 mile annulus, however, is expected to grow by only 28.6 percent (0.5 percent per year), primarily because its major component, the City of New Orleans, is expected to decline in population. The outer annuli (30-40 miles and 40-50 miles from the plant) are expected to more than double their populations. These annuli include St. Tammany Parish and the area influenced by Baton Rouge.

→(LBDCR 15-005, R309)

2.1.3.3

Transient Population

The transient population resulting from recreational, industrial and transportation activity within 10 miles of the Waterford 3 site is estimated to be 119,446 persons. This amount represents daily and seasonal variations in the movement or temporary redistribution of persons within the 10 mile zone as ascertained from the available data base. The transient population is expected to increase to about 2.5 times its current size during the 54 year time span analyzed. The year 2030 estimate of transient population is 298,010 persons. Table 2.1-4 is a summary and percent breakdown of the transient population by activity category for the years 1977 and 2030. Table 2.1-5 and Figures 2.1-22 through 29 show peak seasonal and daily transient population projected from 1977 to 2030 by annular sector. A detailed discussion of each activity category is presented in the following subsections. The methodology employed to estimate and project the transient population is discussed in Subsection 2.1.3.8.

←(LBDCR 15-005, R309)

2.1.3.3.1 Recreation

There were four sources of recreational population data which were analyzed. Table 2.1-6 is a list of the various activities that the local population engages in at least once in the high quarter of recreational activity. The total estimated population involved in these activities is 16,416. Possible places where some of these persons may participate in recreational activities are shown on Figure 2.1-30⁽⁸⁾⁽⁹⁾.

→ (DRN 01-364)

An estimated 35,500 persons are involved in the activities that were projected by annular sector. These included a reported 12,500 average attendance at football games at five high schools within the 10 mile zone⁽¹⁰⁾, 20,000 in attendance at two annual three day festivals that are held the last weekend in October⁽¹¹⁾, and an estimate of 3,000 persons at a local stock car race track stadium⁽¹²⁾. There is also a festival at the Destrehan Plantation in October which draws 10,000 people⁽¹¹⁾. Figure 2.1 shows the locations of these facilities while Table 2.1-7 shows the existing and future estimates for these activities by annular sector. The area within 10 miles of the site contains no state parks.

2.1.3.3.2 Transportation

The area within 10 miles of Waterford 3 is serviced by auto, rail and waterborne transportation modes. There is one public airstrip within the area but no passenger activity occurs there. Figure 2.1-31 shows 1977 and 2030 traffic volumes for the entire transportation network within 10 miles of the plant. These volumes represent a count of the people and not vehicles. The estimated population is 78,598 per day; 90 percent or 70,551, are derived from the Highway network⁽¹³⁾ 9.6 percent or 7,514 persons, are derived from waterborne sources⁽¹⁵⁾⁽¹⁷⁾ and 0.7 percent is derived from rail activity⁽¹⁴⁾. For vehicles on the Highway network and ferries carrying vehicles, 1.5 and 1.79 person per auto occupancy factors were used⁽¹⁶⁾. Table 2.1-8 shows the projected transportation related transient population for the 54 year time span analyzed.

← (DRN 01-364)

2.1.3.3.3 Industrial Employment

Peak daily transient population resulting from industrial employment within 10 miles of Waterford 3 is shown on Table 2.1-9. Figure 2.1-32 shows the location of industrial facilities within 10 miles of Waterford 3. Table 2.1-9 shows both existing and projected peak industrial employment by annular sectors. The peak daily industrial employment represents the largest number of employees at the plants at any given time. In most cases, this is during the day shift. The projection methodology is explained in Subsection 2.1.3.8. Figure 2.1-32 is a map of existing industrial facilities and industrial properties assumed to be available for development during the operating life of Waterford 3.

In 1977, there was a total of 5,324 industrial employees within 10 miles of Waterford 3. Of these, 3,230 worked within five miles of Waterford 3. These totals do not include construction workers on capital improvement projects at the industrial sites because it would be speculative to predict where and when such projects will take place. In such instances, the number of employees at a particular site, and therefore in a particular annular sector,

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could be larger than those shown on Table 2.1-9. Generally large construction projects last for two to five years.

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The industries within 10 miles of Waterford 3 include chemical manufacturers, oil refineries, oil storage facilities, grain elevators, a sugar producer, and a paper company. The largest manufacturer within the study area, in terms of employment, is Dow Chemical (formerly Union Carbide), with 1225 workers on the day shift⁽¹⁸⁾. Dow Chemical is a diversified chemicals manufacturer producing such products as aromatic's, ethylene oxide, epoxy plasticizers and acrylic acid⁽¹⁹⁾. Dow Chemical property is approximately 1.2 miles east-southeast of the Waterford 3 site.

The closest manufacturer to the site is IMC Agrico (formerly Beker Industries), a producer of fertilizer chemicals with a peak of 50 employees at its plant. IMC Agrico property line is 0.6 miles east-southeast of Waterford 3. East of IMC Agrico is the Occidental Chemical Corporation, a manufacturer of chlorine-based chemicals, 0.8 miles from Waterford 3. Occidental and various subcontractors and subsidiaries employ a total of about 400 people on the peak shift. Koch Nitrogen and Nexen Chemical are on Occidental property. Two other small chemical companies, Basell and Witco, are located adjacent to Dow Chemical, and the Shell Chemical Company, employing 300 people at peak, is located across the Mississippi River in Norco, 2.5 miles from Waterford 3. Other major chemical companies within 10 miles of Waterford 3 include DuPont (peak of 350 employees) 5.3 miles northwest of Waterford 3, and Monsanto (peak of 800 employees) 8.5 miles east-southeast.

There are two refineries located in Norco and Good Hope: the Motiva Refinery (formerly Shell Oil Company) with a daily peak of 800 employees, and the Orion Refinery with a peak of 700 employees. The closest of these to the Waterford site is Motiva, 3.5 miles away. Other refineries with oil storage facilities within 10 miles of Waterford 3 include Texaco (peak of 50 employees) 7.9 miles south-southeast of Waterford 3, Marathon Oil Company (peak of 800 employees) nine miles west-northwest, and International Matex Tank Terminal (peak of 100 employees) nine miles east-southeast.

Other industries within 10 miles of Waterford 3 include the Bunge Grain Elevator Company (peak of 210 employees) 8.3 miles east-southeast of Waterford 3.

← (DRN 01-364)

Manufacturing is expected to continue its growth in St. John the Baptist and St. Charles Parishes. In the past, the area has been attractive for development of refineries and petrochemicals because of the easy availability of oil resources in the Louisiana coastal areas. Depletion of petroleum resources in Louisiana could have negative effects on these industries, but the construction of the Louisiana Offshore Oil Port (LOOP) should offset declining state resources of raw materials. Additionally, the fresh water and navigational access provided by the Mississippi River are likely to continue to make the area attractive for industrial development⁽²²⁾. Projections by the U.S. Department of Commerce ⁽²⁰⁾ and projections prepared for the LOOP environmental impact assess ⁽²¹⁾ were analyzed to determine future industrial employment trends. This analysis indicates that coastal Louisiana employment in petrochemical industries is expected to grow rapidly, by four to five percent per year, while employment in refineries is expected to grow by about one percent per year until

1990, after which it should level off. Food products industries, which includes grain elevators and sugar producers, are not expected to grow rapidly.

Estimated future industrial employment by annular sectors is shown on Table 2.1-9. These numbers reflect an assumed employment growth at suitable industrial sites along the Mississippi River. In general, the most rapid industrial development is projected to take place southeast and northeast of Waterford 3. There are some large industrial sites within three miles of Waterford 3 and these can be expected to be developed for industrial use during the life of the plant. These properties consist of a 3100-acre parcel owned by Koch Industries immediately to the west of Killona, and the as yet undeveloped portions of the Occidental Chemical Corporation (formerly Hooker Chemical) and Union Carbide properties.

2.1.3.4 Low Population Zone

→(DRN 03-2055, R14)

The Low Population Zone (LPZ), which is defined as the area within two miles of the Waterford 3 reactor, was selected on the basis of specifications provided in 10CFR100. Figures 2.1-33 and 34 show topographic features, transportation facilities, and the location of schools, major industrial facilities, and parks within this two-mile area.

←(DRN 03-2055, R14)

2.1.3.4.1 Residential Areas

The major residential area within the LPZ is the town of Killona, approximately 0.9 miles west-northwest of the site. The 1977 population of Killona was 1,203 persons (see Subsection 2.1.3). Another concentration of population within the LPZ is the community of Montz, located approximately one mile to the north of the plant on the east bank of the Mississippi River.

2.1.3.4.2 Institutions

There is one school within the LPZ, Killona Elementary School, which is located slightly less than one mile (approximately 5,100 ft.) from the Reactor Building. Membership in the school in March 1972 was 152 students, which is a decline from a 215 student membership in 1973⁽²³⁾ All other schools are beyond three miles from the plant. (The Killona Elementary School is no longer in use.)

There are no other institutions within the LPZ.

2.1.3.4.3 Parks

There are two organized park areas within the LPZ. Killona Park, located approximately 1.1 mile to the northwest of the site, is a 12.5 acre park containing two basketball courts. An additional 12.5 acres is proposed for this park in order to include other athletic facilities for use by the local population. The park now contains baseball fields.

Montz Park is located approximately one mile to the north of the site. This is a nine-acre park containing a baseball field.

2.1.3.4.4 Major Industries

→ (DRN 01-364)

There are nine major industrial facilities within the LPZ: IMC Agrico (formerly Beker Industries), Occidental Chemical Corporation (formerly Hooker Chemical Company), and Dow Chemical (formerly Union Carbide Company). Nexen Chemicals, Koch Nitrogen, Air Products, Praxair, Witco Chemical and Basell Chemical (formerly Shell Chemical).

The closest manufacturer to the site is IMC Agrico, a producer of fertilizer chemicals whose property line is 0.6 miles east-southeast of the site. Peak daily employment at the Agrico plant is 50 persons⁽²⁵⁾.

East of Agrico is the Occidental Chemical Corporation, a manufacturer of chlorine-based chemicals located 0.8 miles from Waterford 3. Occidental and various sub-contractors and subsidiaries employ a total of 400 people on the peak shift⁽²⁶⁾. Also located on the Occidental Chemical property is Koch Nitrogen and Nexen Chemical.

Dow Chemical, approximately 1.2 miles east-southeast of Waterford 3, is a diversified chemicals manufacturer producing such products as aromatics, ethylene oxide, epoxy plasticizers, and acrylic acid. It employs 1,225 workers on the day shift⁽²⁷⁾.

Two other smaller chemical companies, Basell (formerly Shell Chemical) and Witco, are located adjacent to Union Carbide, with a peak total employment of 50 workers.

← (DRN 01-364)

2.1.3.4.5 Transportation Facilities

Table 2.1-12 is a listing of the major transportation facilities within the LPZ, including the Mississippi River, the Union Pacific Railroad and major highways.

The nearest distance of each facility to the Waterford 3 site, and traffic volumes are given in the Table. Traffic volumes are expressed in terms of the average number of persons per day using these transportation corridors.

2.1.3.4.6 Peak Daily Population Distribution

Table 2.1-13 shows the 1977 distribution of residential and transient population by annular sector within two miles of Waterford 3. The distribution of population does not include Killona Elementary School, which is considered to consist primarily of resident population from the immediate vicinity. (This school is no longer active.) Nor does this number include attendance at parks, because such statistics were not available. The peak daily population total is the combined total of resident and transient population, representing the largest number of people expected to be in the area on an average day.

2.1.3.5 Population Center

The nearest population center, as defined in 10CFR100, is the urbanized area of New Orleans, whose western boundary is 11.6 miles from the Waterford 3 reactor. This boundary line was determined after a study of USGS topographic maps of 1:24,000 (1 in. = 2,000 ft.) scale. The boundary line is coincident with the St. Charles Parish - Jefferson Parish boundary.

In 1970, the population of the New Orleans urbanized area was 961,728⁽²⁸⁾. This population should grow at least as rapidly as that of the New Orleans SMSA, which consists of Jefferson,

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Orleans, St. Bernard and St. Tammany Parishes. The 1970 SMSA population was 1,045,809, and the 2030 population of the SMSA is projected to be 2,003,991, which represents an annual growth rate of 1.1 percent over the life of the Waterford 3 plant.

It is likely that the New Orleans urbanized area will shift progressively closer to Waterford 3 as the expected urbanization of eastern St. Charles Parish takes place. There should also be substantial growth in and around population centers closer to the plant, although none of these centers is expected to exceed 25,000 persons in population by 2030. Subsection 2.1.3.2 discusses expected population trends near the plant in more detail.

New Orleans also represents the largest concentration of transient population within 50 miles of Waterford 3. It is the largest employment center in Louisiana, has the most traffic, and is the largest tourist attraction in the region. In 1970, the New Orleans SMSA had a total employment of 476,260 people⁽²⁹⁾. In 1975, there were 17,328 hotel and motel rooms in the New Orleans SMSA, with the addition of another 2,942 rooms due for completion by 1977⁽³⁰⁾. These rooms are completely occupied during Sugar Bowl Weekend (December 30 - January 1) and Mardi Gras⁽³¹⁾.

2.1.3.6 Population Density

The cumulative resident population and cumulative population density for 1981 and 2030 are given in Tables 2.1-10 and 2.1-11 for a distance of 30 miles in all directions from the Waterford site. The largest concentration of population for 1981 is in the East (E) sector, with a cumulative population within 30 miles of the plant of 797,066 and a cumulative density of 4510.6 persons per square mile.

Cumulative resident population density in 1981 for all sectors out to 30 miles is also compared in Table 2.1-10 with a uniform population density of 500 persons per square mile. Out of a total of 128 cumulative annular sectors within 30 miles of the site, twelve, or nine percent, exceed the density of 500 persons per square mile. These fall generally within the East and ESE sectors and are representative of the population centers in and around New Orleans. The only high density cumulative annular sectors close to the plant are WNW 1 and 2, which encompass the town of Killona, adjacent to the Applicant's property.

For the year 2030, the largest concentration of population within 30 miles is expected to be in the E sector, with a cumulative population of 1,116,644, and a density of 6319.1 persons per square mile. In comparing the 2030 cumulative population to 30 miles in all directions from the plant site with a uniform population density of 1000 persons per square mile, it is found that a total of 10, or approximately eight percent of the 128 cumulative sectors have population densities greater than 1000 persons per square mile. These densities occur primarily within the E, ESE and WNW sectors mentioned earlier.

2.1.3.7 Methodologies for Estimating and Projecting Resident Population

Estimates and projections of resident population were carried out by two different methodologies, one applying to the area within 50 miles of Waterford 3 (Methodology A) and the other applying only to that area within five miles of Waterford 3 (Methodology B). Methodology A estimated current and projected populations by annular sectors in the area between five and 50 miles from the plant, and for the total area (not by annular sectors) within five miles of the plant. Methodology B utilized the estimates of current population

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and projections of population totals within five miles of the plant, as derived in Methodology A, and allocated these totals by annular sector on the basis of an analysis of residential development suitability. Table 2.1-14 summarizes these methodologies.

The population data was estimated for 1977, and then projections were prepared for the years 1980, 1981 (the date of plant start-up), 1990, 2000, 2010, 2020, and 2030. The two methodologies are described in detail below.

Methodology A:

0-50 Miles

Population by annular sectors in the region within 50 miles of Waterford 3 was calculated for 1977 and the projection years between 1980 and 2030 by the following method:

- a) USGS Maps (scale 1:250,000) of the area within 50 miles of the plant site were overlaid by annular sectors defined by annuli at five, 10, and then every 10 miles out to 50 miles from the plant, and by sectors centered on the sixteen cardinal compass points, with the northernmost sector centered on true north. The area within five miles of the plant was considered as a unit.
- b) The boundaries of all parish sub-divisions (including wards, towns and unincorporated areas) shown in the 1970 US Census⁽⁴⁸⁾ were drawn on the USGS Maps. In the area between 0 and 10 miles, the boundaries of US Census enumeration districts were drawn. The boundaries of water and wetlands, within 50 miles of Waterford 3 as indicated on the USGS maps, were also drawn.
- c) The percentage of the area of each parish sub-division within each annular sector, excluding water and wetlands areas, was calculated. This measurement was done by a Bendix digitizer in March, 1977. In some cases, the percentages were calculated manually where more detailed information on population distribution was available. This was the case in several instances inside the 10-mile annulus and in New Orleans.
- d) The 1970 population of each parish sub-division was calculated as a percentage of that parish. These percentages were then applied to parish populations for each projection period to arrive at population projections for each parish sub-division. The parish projections were based on those published by the University of New Orleans (UNO) College of Business Administration⁽⁴⁹⁾, which are the most recent and widely used population projections in the State. The projections utilized a natural increase - net migration model incorporating fertility, mortality, and migration statistics. Series two of the UNO projections was used. There are three different series of projections, each based upon different migration assumptions. Series one projections assume that migration rates throughout the projection period would remain the same as they were in the 1960-1970 period. Series three assumes zero net migration. Series two embodies the following assumptions (only those pertinent to the area within 50 miles of Waterford 3 are listed)⁽⁴⁹⁾:
 - 1) The nation will continue to experience periods of high-priced fuel.

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- 2) Rural-to-urban and inner-urban-to-suburban migrations will continue, but at reduced rates. Slowing down rural-to-urban migration will be the fact that large-scale mechanization of agriculture has already occurred; slowing down inner-urban-to-suburban migration will be the increasing cost of travel.
- 3) Net out-migration rates of blacks will be lowered, as they look more closely at nearby locations rather than moving out of the State.
- 4) Stabilization will occur in most university enrollments, with an increase in the percentage of students attending graduate school. More students are expected to register in universities nearer to their homes.
- 5) The trend of growth of medium-sized towns will continue.
- 6) With the exception of I-310 all planned interstate highways are expected to be completed and open by 1980. It was assumed that only that portion of I-310 crossing the Mississippi River near Luling would be built⁽⁵⁰⁾.
- 7) The federal flood insurance regulations will grow stronger over time.

→ (DRN 01-464)

The UNO parish population projections were for the years 1980, 1985, 1990, 1995, and 2000; therefore projections coinciding with NRC projection years were used. For the years 1977 and 1981, linear interpolations between the UNO projections were used. After 2000, the growth rate in the period 1990-2000 was assumed to continue to 2030. This assumption was felt to be relatively safe and conservative in light of the speculative nature of such distant-future projections.

← (DRN 01-464)

- e) The resulting population projections for each parish subdivision were evaluated, taking into account 1960 and 1970 population changes. In the few cases where the mechanical projection technique specified in "d" above provided unlikely results, the population projections for those parish subdivisions were calculated manually based upon past trends.
- f) The area percentages of each parish sub-division, within given annular sectors (from step "c" above), were applied to the parish subdivision projections in order to allocate the population among annular sectors.
- g) The population projections for each parish sub-division by annular sector were summed to arrive at the total population by annular sector.
- h) Population projections for each annular sector were evaluated, and adjusted manually if necessary. This was the case in only one instance (Annular Sector E-20-30) in the New Orleans area, where it was assumed that the land within the annular sector would be entirely built up by the year 2000, and any population increases thereafter would be allocated to surrounding annular sectors.

In Methodology A, the area within five miles of Waterford 3 was considered as one annular sector, and a total population projection within that area was arrived at. This population was then allocated to annular sectors within five miles in accordance with Methodology B described below.

Methodology B:

Inside 5 Miles

The existing population by annular sector within five miles of Waterford 3 was estimated by the following method:

- a) USGS maps (scale 1:24,000) of the area within five miles of Waterford 3 were overlaid with annular sectors defined by annuli every mile out to five miles, and by sectors centered on the 16 cardinal compass points.
- b) These annular sector boundaries were transferred to aerial photographs of one in. = 800 ft. flown in February 1977.
- c) Dwelling units shown on the aerial photographs were counted, and then allocated to annular sectors. Where questions existed as to use of a structure as a dwelling unit, or the number of dwelling units contained within a structure, field checks in March 1977 were made to determine the correct situation.
- d) The dwelling unit counts by area, made in step "c", were checked for accuracy against dwelling unit counts carried out in 1973 in St. Charles and St. John Parishes by N-Y Associates⁽³⁶⁾. If necessary, re-counts from the aerial photographs were made to be certain of accuracy.
- e) A map of 1970 Census enumeration districts was laid over the map Showing dwelling unit counts by annular sector. 1970 Census population-per-housing-unit factors for appropriate enumeration districts were then applied to dwelling unit counts to derive population estimates by annular sectors.
- f) The resulting estimate of total population within five miles was compared with the same estimate obtained in Methodology A. The higher total was utilized. In this case, the total within five miles of Waterford 3, as developed through Methodology B, was 16,123 persons; the total derived by Methodology A was 17,268 persons, 7.1 percent higher than the first total. The annular sector estimates obtained in step "e" were then increased by 7.1 percent each to arrive at the totals shown for 1977 in Table 2.1-1.

Future population projections by annular sectors for the area within five miles of Waterford 3 were obtained as follows:

- a) The total population of the area within five miles was projected to the year 2030 by Methodology A, which is described above. The increments by projection period were then calculated.
- b) Areas pre-empted from future residential development were identified. These included:
 - 1) Wetlands;
 - 2) Areas covered by the Mississippi River, the batture (the area between the levee and the River edge), the levee system, and the Bonnet Carre Floodway;

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- 3) All land currently developed for non-agricultural use;
- 4) All land presently zoned for manufacturing⁽³⁷⁾.
- 5) It was assumed that no land between the easternmost and westernmost manufacturing zone lines on the west bank of the Mississippi River would be developed after 1981 for residential use.

No other land was pre-empted from future residential use. The resulting areas remaining for residential use (hereafter referred to as "potential development areas") are substantially in accordance with the present St. Charles Parish zoning ordinance. They are also substantially in accordance with the St. Charles Parish Future Land Use Plan⁽³³⁾, although that plan has never been formally adopted. Undeveloped industrial sites indicated on promotional maps⁽³⁸⁾ were not assumed to pre-empt residential use. The supply of undeveloped industrial land along the Mississippi River, according to these maps, contains considerably more acreage than all of the industrial land which has been developed. Therefore, it cannot be assumed that the existence of these undeveloped sites will pre-empt other land uses.

- c) Development suitability was assessed for the potential development areas defined in "b" above. Suitability ratings were calculated based upon giving the lowest score to the most highly suitable land for development. Suitability ratings were determined by taking into account the following factors:

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- 1) An area's accessibility to employment centers, which, in this case, are in New Orleans. This factor was considered to be most important in determining the attractiveness of an area for development⁽³⁹⁾⁽⁴⁰⁾. To determine a quantitative suitability for every area, the study area was divided by isopleths indicating five-minute driving time differentials. The driving times were determined by timing actual drives to various areas from New Orleans in March 1977. The isopleths were re-mapped to take into account highway improvements projected for 1981. Areas between isopleths were given suitability ratings from one to "n", with one being the closest area to New Orleans and "n" being the farthest area.

←(DRN 01-464)

- 2) The suitability of an area's soils for development. USDA general soil maps for St. Charles and St. John Parishes⁽⁴¹⁾⁽⁴²⁾ were consulted to define areas with good soils, and areas with the next best soils for development. The former areas were given a suitability rating of 0, the latter one.
- 3) An area's potential for flooding. Those areas within the floodplain of the 100-year storm were identified from the latest Flood Hazard Boundary Maps⁽⁴³⁾⁽⁴⁴⁾. Areas within the floodplain were given a suitability rating of one, those outside the floodplain 0.
- 4) An area's water and sewer services. No sewer service is presently available to potential development areas; water service is available to all areas. Sewer service will probably be supplied to all areas between 1980 and 1990⁽⁴⁵⁾.

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Therefore, availability of water and sewer services was not considered to be a differentiating factor for development suitability ratings.

- 5) An area's schools and recreational facilities. No plans exist at the present time indicating the future placement of these facilities. Typically, their construction follows residential development in an area. Therefore, development suitability ratings were not assigned to this factor.

Quantitative development suitability ratings were mapped, and then the maps for each factor were overlaid on the base map of the study area. The ratings were then summed, yielding a development suitability score for each area not pre-empted for future development. One map was developed for the 1977-1981 period, and a second for the 1981-2030 period, reflecting changing accessibility of New Orleans, expected after 1981.

- d) The probability of development taking place at each level of development suitability was assessed. The growth rates in four areas between 1973 and 1977 were evaluated in relation to the overall development suitability within each area. The four areas were chosen because they surround population centers near large areas of vacant land where development has been occurring in the recent past. The development suitability factor utilized was a weighted average of all the 1977 suitabilities within the area, taking into account the size of each suitability level. The 1977 suitability levels were used because:
 - 1) Information on specific areas developed between 1973 and 1977 was not available, and an accurate determination of vacant land in 1973 could not be made;
 - 2) The four areas considered presently consist mostly of vacant land, and it was felt that the current levels of suitability would accurately reflect the 1973 suitabilities.

With the above data, a regression analysis was used to relate development suitability to dwelling unit growth. The results of this analysis are given in Table 2.1-15. The resulting regression line was used to establish the probabilities of residential development by suitability level shown in Table 2.1-16. Subsequent to 1981, highway improvements within the study area are expected to alter development suitability levels. It is expected that the least desirable levels will no longer be available. Probabilities of residential development were adjusted accordingly (see Table 2.1-16).

- e) The population increments for each projection year (see step "a") were allocated to annular sectors as follows:
 - 1) The population increment was allocated to various levels of suitability according to the probabilities shown in Table 2.1-16.
 - 2) The area of each suitability level within each annular sector was measured and taken as a percentage of the total area within that level of development suitability. The population within each suitability level, obtained in Step 1) was allocated to each annular sector according to these percentages.
 - 3) The populations by suitability level within each annular sector were summed to

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arrive at a total population increment by annular sector.

To account for the possibility that the land available within a suitability level could be used up, a running tally was kept of the additional land utilized by suitability level in each projection period. Based upon a study of land use developed statistics in St. John the Baptist and St. Charles Parishes,⁽⁴⁶⁾⁽⁴⁷⁾ a factor of seven persons per acre was utilized to simulate the increases in residential land usage within each suitability level. Residential development probabilities were adjusted if land-did run out at a given level of development suitability (see Table 2.1-16).

Methodology B was pursued only within five miles of the plant because of the fine level of detail required to project population within each of the small annular sectors there. Outside of five miles, a more general approach was appropriate because of the considerably larger land area in each annular sector, and Methodology A was utilized.

2.1.3.8 Methodologies for Estimating and Projecting Transient Population

The analysis of transient population is an attempt to assess temporary movement or distribution of the population. There were three major land use categories from which this assessment was to be made. These include recreation, transportation, and industrial activity. The methodology employed to evaluate each source of transient population is discussed below.

2.1.3.8.1 Recreation

Four sources of transient population resulting from recreational activity were assessed. These included attendance at high school football games, two annual three day festivals, a drag strip near Laplace and potential attendance at a stock car race track stadium. Population from these sources was reported to be approximately 35,500⁽⁵³⁾⁽⁵⁴⁾⁽⁵⁵⁾. Estimated attendance at the stadium, dragstrip and the festivals was allocated by annular sector by locating the facilities on a map with the annular sector grid superimposed. Where annular sector grid lines coincided with an activity, this activity was a split evenly between two adjacent sectors. (The LaPlace drag strip is no longer in use.)

In projecting future recreational transient population for the festivals in La Place and Destrehan, growth factors based upon the estimate of the population with 50 miles of Waterford 3 were used (see Subsection 2.1.3-3). This was because most of the people attending these activities will probably travel from distances further than 10 miles from Waterford 3. Attendance at the local high school football stadiums shown on Figure 2.1-30 was assumed to remain the same throughout the life of the plant. It is recognized that the increasing population within 10 miles of Waterford 3 will probably result in the construction of new high schools and therefore additional football stadiums. However, accurate prediction of their locations cannot be made at this time.

In addition to the foregoing, an analysis was made of a survey undertaken by the State Parks and Recreation Commission. This survey contained a participation rate factor which when multiplied by the local population produces total local participation in a variety of activities. The sum of participation for each activity is an estimate of the number of persons involved in recreational activity. Averaging these over time gives the estimated average participation within a specific time frame. For the purposes of this study, the time

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frame was the average Sunday during the peak period of recreational activity which runs from June through August. The estimated population resulting from this analysis was 16,416 (see Subsection 2.1-3.3-1). Although it was possible to derive a reasonable assessment of the population involved, it was not possible to determine where the people engaged in their activities⁽⁵¹⁾⁽⁵²⁾. While it can be assumed that many persons from the survey area use local facilities, it is not unreasonable to assume that some could go outside the 10 mile zone. For this reason no attempt was made to allocate this surveyed population by annular sector.

2.1.3.8.2 Transportation

The area within 10 miles of Waterford 3 is served by auto, rail and waterborne transportation modes. There are no significant airports within 10 miles of the site. Traffic estimates as well as growth factors were obtained from principal rail and ship operators in the Louisiana Department of Transportation and Development⁽⁵⁶⁾⁽⁵⁷⁾⁽⁵⁸⁾⁽⁶⁰⁾. No attempt was made to project future transportation activity by annular sector. It was felt that to do so would result in overstating transportation activity and consequently overstating the size of the transient population, because the traffic on any given route passing through several annular sectors would be counted in each annular sector. Therefore, projections using the reported growth factors for each mode of travel were prepared and presented in total in tabular form (see Table 2.1-8). In addition, for highway related activity a vehicle occupancy factor of 1.5 was used to produce total traffic on the highway network and⁽⁵⁶⁾, for vehicles on ferries a 1.79 occupancy factor was used⁽⁵⁹⁾.

2.1.3.8.3 Industrial Employment

Industrial employment within 10 miles of Waterford 3 was estimated for 1977 from information provided by industries in the area, which are listed in Subsection 2.1.3.3.3. The industrial employment numbers shown in Table 2.1-9 include only the peak number of workers on a plant site at any given time, which in most cases is the day shift employment.

The number of workers was allocated to annular sectors by superimposing a diagram of annular sectors over a base map showing the developed industrial properties. This is displayed in Figure 2.1-32. Where a property was overlaid by two or more annular sectors, the employment numbers were divided among the annular sectors according to the proportion of the industrial property in each.

Future industrial employment was projected as follows:

- a) The 1977 industrial employment was divided according to categories utilized by the U.S. Department of Commerce, Bureau of Economic Analysis⁽⁶¹⁾. The categories used in this projection were the following:
 - Chemical and Allied Products
 - Petroleum Refining
 - Food and Kindred Products
 - Paper and Allied Products

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- b) Growth rates for each of the above industrial employment categories were projected to 2030 by analyzing regional projections by the U.S. Department of Commerce⁽⁶¹⁾, and projections prepared for the Louisiana Offshore Oil Port (LOOP) environmental impact assessment⁽⁶²⁾. Where these sources disagreed, an average growth rate figure was utilized.
- c) Known future expansions for each industry, derived by surveys of the companies involved, were added to 1977 employment figures.
- d) Growth rates arrived at in step "b" were applied to 1977 employment totals to arrive at projected employment for each projection year (1980, 1981, 1990, 2000, 2010, 2020 and 2030). Known future expansion totals from step "c" for each industry were compared with these projections and the higher total was utilized.
- e) Projected employment by industries was allocated to annular sectors as follows:
 - 1) A map of properties available for industrial use, shown in Figure 2.1-32, was prepared, based upon information obtained from promotional maps for the area⁽⁶³⁾. Not all the industrial sites shown on these maps were included because other uses were felt more likely to develop on them. Undeveloped portions of existing industrial properties were also included on this map.
 - 2) The annular sector grid was placed over the map of industrial sites developed above. Projected industrial employment was apportioned according to the percentage of all available undeveloped industrial land falling within each annular sector. The following assumptions were made in this apportionment:
 - Known expansions of employment would be allocated to the appropriate developed industrial property;
 - Incremental employment projections above known expansions were allocated evenly to all undeveloped industrial properties;
 - Those portions of undeveloped industrial tracts including wetlands would remain undeveloped.

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TABLE 2.1-1 (Sheet 1 of 8)

RESIDENT POPULATION WITHIN 50 MILES OF WATERFORD 3

1977																	
SECTOR	0-1	1-2	2-3	3-4	4-5	5-10	**	TOTAL 0-10	*	10-20	20-30	30-40	40-50	*	TOTAL 10-50	**	TOTAL 0-50
N	0	171	311	870	2120	3149	*	6621	*	0	1432	38688	12255	*	52375	*	58996
NNE	0	154	0	331	174	404	*	1063	*	0	120	11299	11822	*	23241	*	24304
NE	63	150	0	0	0	0	*	213	*	0	0	8343	10463	*	18805	*	19018
ENE	33	0	0	2206	105	0	*	2344	*	7504	0	575	31012	*	39092	*	41436
E	0	0	99	3380	610	1430	*	5519	*	215564	555731	57377	0	*	828672	*	834191
ESE	0	0	0	1339	1151	7350	*	9840	*	35619	170248	11462	3109	*	220437	*	230278
SE	0	0	0	0	429	5130	*	5559	*	320	2290	3371	2899	*	8881	*	14440
SSE	0	0	0	0	0	1294	*	1294	*	1197	2911	9152	4268	*	17528	*	18822
S	0	0	0	0	0	179	*	179	*	4013	10805	9058	0	*	23875	*	24055
SSW	0	0	0	0	0	0	*	0	*	1582	10771	58624	2593	*	73570	*	73570
SW	0	0	0	0	0	0	*	0	*	562	22939	5983	155	*	29639	*	29639
WSW	0	0	0	0	0	0	*	0	*	2249	18124	5583	30423	*	56379	*	56379
W	26	307	0	21	0	524	*	878	*	5808	2862	11087	5735	*	25492	*	26369
WNW	232	435	0	0	0	4515	*	5182	*	9332	6771	26045	12649	*	54797	*	59979
NW	99	104	108	0	363	7289	*	7963	*	71	3391	11661	86743	*	101866	*	109829
NNW	0	0	11	497	1369	2438	*	4315	*	0	3622	8286	6117	*	18025	*	22340
TOTAL	453	1321	529	8644	6321	33702	*	50970	*	283822	812018	276593	220242	*	1592676	*	1643646

Source: Survey and calculations by Ebasco Services, Inc. Methodology explained in Subsection 2.1.3.7.

*Note: Totals may not always add to last significant figure due to roundoff.

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TABLE 2.1-1 (Sheet 2 of 8)

RESIDENT POPULATION WITHIN 50 MILES OF WATERFORD 3

<u>1980</u>																	
SECTOR	0-1	1-2	2-3	3-4	4-5	5-10	*	TOTAL	*	10-20	20-30	30-40	40-50	*	TOTAL	*	TOTAL
								0-10							10-50		0-50
N	0	182	334	896	2175	3266	*	6853	*	0	1515	40718	12825	*	55058	*	61912
NNE	0	171	51	366	325	419	*	1332	*	0	127	12145	12756	*	25029	*	26361
NE	63	166	5	15	3	0	*	252	*	0	0	9021	11314	*	20335	*	20587
ENE	33	0	0	2206	105	0	*	2344	*	8295	0	622	33535	*	42452	*	44796
E	0	0	102	3386	626	1519	*	5633	*	236347	548275	60803	0	*	845425	*	851059
ESE	0	0	21	1421	1166	7809	*	10417	*	39314	182279	12192	3396	*	237181	*	247598
SE	0	0	20	65	548	5449	*	6082	*	340	2531	3615	2972	*	9458	*	15540
SSE	0	0	0	0	0	1375	*	1375	*	1271	3020	9496	4213	*	18001	*	19375
S	0	0	0	0	0	190	*	190	*	4256	11073	9450	0	*	24779	*	24969
SSW	0	0	0	0	0	0	*	0	*	1642	11188	61340	2715	*	76885	*	76885
SW	0	0	0	0	0	0	*	0	*	583	23847	6159	162	*	30751	*	30751
WSW	0	8	0	0	0	0	*	8	*	2276	18677	5704	32191	*	58848	*	58856
W	26	318	0	21	0	543	*	908	*	5862	2830	11231	5821	*	25744	*	26652
WNW	232	435	3	17	27	4683	*	5397	*	9443	7034	27615	12825	*	56917	*	62314
NW	99	104	132	27	384	7562	*	8308	*	74	3616	12427	91330	*	107447	*	115755
NNW	0	0	19	518	1375	2530	*	4442	*	0	3905	8934	6556	*	19395	*	23836
TOTAL	453	1384	687	8938	6734	35345		53541	*	309704	819917	291474	232611	*	1653706	*	1707247

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TABLE 2.1-1 (Sheet 3 of 8)

RESIDENT POPULATION WITHIN 50 MILES OF WATERFORD 3

SECTOR	1981																
	0-1	1-2	2-3	3-4	4-5	5-10	*	TOTAL	*	10-20	20-30	30-40	40-50	*	TOTAL	*	TOTAL
								0-10							10-50		0-50
N	0	186	343	906	2196	3310	*	6941	*	0	1526	40915	12892	*	55333	*	62274
NNE	0	178	70	379	383	424	*	1434	*	0	128	12382	13056	*	25566	*	27000
NE	63	172	6	22	4	0	*	267	*	0	0	9254	11605	*	20859	*	21126
ENE	33	0	0	2206	105	0	*	2344	*	8540	0	638	34402	*	43581	*	45925
E	0	0	103	3388	633	1552	*	5676	*	243904	547486	61915	0	*	853305	*	858982
ESE	0	0	29	1451	1171	7979	*	10630	*	40465	186443	12434	3483	*	242825	*	253455
SE	0	0	27	89	592	5569	*	6277	*	348	2606	3697	3005	*	9655	*	15932
SSE	0	0	0	0	0	1405	*	1405	*	1299	3056	9609	4236	*	18200	*	19605
S	0	0	0	0	0	195	*	195	*	4346	11184	9591	0	*	25120	*	25315
SSW	0	0	0	0	0	0	*	0	*	1662	11328	62379	2761	*	78129	*	78129
SW	0	0	0	0	0	0	*	0	*	590	24180	6255	165	*	31190	*	31190
WSW	0	10	0	0	0	0	*	10	*	2283	18880	5749	32781	*	59694	*	59704
W	26	322	0	21	0	550	*	919	*	5880	2833	11310	5849	*	25873	*	26792
WNW	232	435	4	25	37	4746	*	5479	*	9476	7164	28271	12880	*	57791	*	63271
NW	99	104	142	37	392	7663	*	8437	*	75	3703	12729	92970	*	109477	*	117914
NNW	0	0	22	526	1377	2563	*	4488	*	0	3993	9136	6693	*	19822	*	24310
TOTAL	453	1407	746	9050	6890	35957	*	54503	*	318869	824510	296263	236779	*	1676421	*	1730924

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TABLE 2.1-1 (Sheet 4 of 8)

RESIDENT POPULATION WITHIN 50 MILES OF WATERFORD 3

1990

SECTOR	0-1	1-2	2-3	3-4	4-5	5-10	*	TOTAL	*	10-20	20-30	30-40	40-50	*	TOTAL	*	TOTAL
								0-10							10-50		0-50
N	0	203	383	970	2325	3732	*	7613	*	0	1663	43870	13819	*	59352	*	66966
NNE	0	206	200	549	586	479	*	2020	*	0	137	14792	16008	*	30937	*	32956
NE	63	195	53	53	10	0	*	374	*	0	0	11515	14441	*	25956	*	26330
ENE	33	0	0	2206	105	0	*	2344	*	10733	0	794	42804	*	54331	*	56675
E	0	0	103	3429	672	1855	*	6059	*	311694	534702	71695	0	*	918091	*	924149
ESE	0	0	34	1718	1294	9536	*	12582	*	50763	224061	14493	4258	*	293575	*	306156
SE	0	0	27	204	967	6655	*	7853		415	3276	4397	3253	*	11341	*	19194
SSE	0	0	0	0	0	1679	*	1679	*	1553	3370	10598	4439	*	19960	*	21639
S	0	0	0	0	0	233	*	233	*	5162	12153	10868	0	*	28183	*	28416
SSW	0	0	0	0	0	0	*	0	*	1833	12563	71882	3184	*	89462	*	89462
SW	0	0	0	0	0	0	*	0	*	651	27176	7125	190	*	35142	*	35142
WSW	0	10	0	0	0	0	*	10	*	2364	20675	6165	35194	*	64399	*	64409
W	26	322	0	21	0	620	*	989	*	6089	2879	12069	6155	*	27193	*	28182
WNW	232	435	30	179	559	5351	*	6786	*	9848	8410	34527	13043	*	65829	*	72615
NW	99	104	251	245	559	8640	*	9898	*	84	4529	15575	106973	*	127162		137060
NNW	0	0	63	643	1388	2890	*	4984	*	0	4827	11042	7953	*	23822	*	28807
TOTAL	453	1475	1144	10217	8465	41670	*	63424	*	401189	860423	341407	271715	*	1874734	*	1938158

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TABLE 2.1-1 (Sheet 5 of 8)

RESIDENT POPULATION WITHIN 50 MILES OF WATERFORD 32000

SECTOR	0-1	1-2	2-3	3-4	4-5	5-10	*	TOTAL 0-10	*	10-20	20-30	30-40	40-50	*	TOTAL 10-50	*	TOTAL 0-50
N	0	221	425	1037	2460	4134	*	8277	*	0	1852	48055	15116	*	65022	*	73299
NKE	0	235	335	725	798	530	*	2623	*	0	150	17850	19712	*	37712	*	40335
NE	63	219	102	85	16	0	*	485	*	0	0	14335	17978	*	32313	*	32798
ERE	33	0	0	2206	105	0	*	2344	*	12483	0	989	53292	*	66764	*	69108
E	0	0	103	3472	712	2179	*	6466	*	365840	530962	80110	0	*	976912	*	983378
ESE	0	0	39	1996	1422	11202	*	14659	*	59060	254707	16310	4908	*	334984	*	349643
SE	0	0	27	324	1358	7818	*	9527	*	488	3810	4987	3516	*	12800	*	22327
SSE	0	0	0	0	0	1972	*	1972	*	1824	3587	11280	4579	*	21270	*	23242
S	0	0	0	0	0	273	*	273	*	6023	12822	11711	0	*	30556	*	30829
SSW	0	0	0	0	0	0	*	0	*	1950	13406	78017	3457	*	96830	*	96830
SW	0	0	0	0	0	0	*	0	*	693	29169	7688	207	*	37756	*	37756
WSW	0	10	0	0	0	0	*	10	*	2411	21918	6485	38159	*	68973	*	68983
W	26	322	0	21	0	687	*	1056	*	6235	2905	12731	6342	*	28213	*	29270
WNW	232	435	57	339	1103	5928	*	8094	*	10111	9675	40915	12985	*	73687	*	81781
NW	99	104	365	462	733	9571	*	11334	*	93	5418	18621	120272	*	144405	*	155739
NWW	0	0	106	765	1399	3201	*	5471	*	0	5859	13405	9515	*	28779	*	34250
TOTAL	453	1546	1559	11432	10106	47495	*	72591	*	467211	896241	383487	310038	*	2056977	*	2129568

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TABLE 2.1-1 (Sheet 6 of 8)

RESIDENT POPULATION WITHIN 50 MILES OF WATERFORD 3

SECTOR	<u>2010</u>														TOTAL 0-50
	0-1	1-2	2-3	3-4	4-5	5-10	*	TOTAL 0-10	*	10-20	20-30	30-40	40-50	*	
N	0	242	473	1115	2616	4580	*	9026	*	0	2066	52698	16565	*	80355
NNE	0	269	491	929	1044	587	*	3320	*	0	165	21602	24302	*	49389
NE	63	247	160	122	23	0	*	615	*	0	0	17848	22383	*	40846
ENE	33	4	0	2206	105	0	*	2348	*	14512	0	1231	66349	*	84440
E	0	0	103	3521	758	2559	*	6941	*	428617	527673	89823	0	*	1053055
ESE	0	0	45	2318	1570	13157	*	17090	*	68685	290310	18370	5655	*	400110
SE	0	0	27	463	1812	9182	*	11484	*	573	4429	5660	3799	*	25945
SSE	0	0	0	0	0	2316	*	2316	*	2143	3818	12004	4728	*	25008
S	0	0	0	0	0	321	*	321	*	7031	13530	12618	0	*	33500
SSW	0	0	0	0	0	0	*	0	*	2076	14304	84677	3754	*	104810
SW	0	0	0	0	0	0	*	0	*	737	31308	8298	225	*	40568
WSW	0	10	0	0	0	0	*	10	*	2459	23236	6821	41128	*	73654
W	26	322	0	21	0	761	*	1130	*	6393	2933	13462	6543	*	30462
WNW	232	435	88	526	1733	6567	*	9581	*	10393	11179	48537	12951	*	92640
NW	99	104	496	714	934	10603	*	12950	*	103	6482	22265	135479	*	177280
NNW	0	0	156	906	1412	3547	*	6021	*	0	7113	16275	11404	*	40812
TOTAL	453	1633	2039	12841	12007	54180	*	83153	*	543723	938545	432188	355265	*	2352874

WSES-FSAR-UNIT-3

TABLE 2.1-1 (Sheet 7 of 8)

RESIDENT POPULATION WITHIN 50 MILES OF WATERFORD 3

2020

SECTOR	0-1	1-2	2-3	3-4	4-5	5-10	*	TOTAL 0-10	*	10-20	20-30	30-40	40-50	*	TOTAL 10-50	*	TOTAL 0-50
N	0	266	529	1205	2798	5074	*	9872	*	0	2308	57859	18189	*	78356	*	88228
NNE	0	308	672	1168	1329	650	*	4127	*	0	180	26210	29993	*	56384	*	60512
NE	63	279	227	165	31	0	*	765	*	0	0	22221	27868	*	50089	*	50854
ENE	33	6	0	2206	105	0	*	2350	*	16864	0	1532	82605	*	101002	*	103352
E	0	0	103	3578	812	3007	*	7500	*	501407	524886	101026	0	*	1127319	*	1134819
ESE	0	0	52	2692	1742	15456	*	19942	*	79849	331655	20705	6513	*	438723	*	458665
SE	0	0	27	625	2339	10786	*	13777	*	673	5147	6432	4106	*	16357	*	30134
SSE	0	0	0	0	0	2721	*	2721	*	2517	4061	12771	4885	*	24234	*	26956
S	0	0	0	0	0	377	*	377	*	8213	14282	13595	0	*	36090	*	36467
SW	0	0	0	0	0	0	*	0	*	2208	15258	91898	4075	*	113440	*	113440
SW	0	0	0	0	0	0	*	0	*	784	33606	8959	244	*	43594	*	43594
WSW	0	10	0	0	0	0	*	10	*	2509	24633	7173	44353	*	78668	*	78678
W	26	322	0	21	0	844	*	1213	*	6561	2963	14274	6758	*	30556	*	31768
WNW	232	435	124	742	2467	7275	*	11275	*	10694	12966	57620	12966	*	94246	*	105521
NW	99	104	649	1006	1168	11746	*	14772	*	115	7756	26622	152910	*	187402	*	202174
NNW	0	0	214	1070	1428	3929	*	6641	*	0	8636	19757	13691	*	42084	*	48725
TOTAL	453	1730	2597	14478	14219	61865	*	95342	*	632395	988338	488655	409157	*	2518544	*	2613886

WSES-FSAR-UNIT-3

TABLE 2.1-1 (Sheet 8 of 8)

RESIDENT POPULATION WITHIN 50 MILES OF WATERFORD 3

2030																	
SECTOR	0-1	1-2	2-3	3-4	4-5	5-10	*	TOTAL 0-10	*	10-20	20-30	30-40	40-50	*	TOTAL 10-50	*	TOTAL 0-50
N	0	299	606	1329	3046	5620	*	10900	*	0	2585	63602	20012	*	86199	*	97100
NNE	0	362	920	1493	1719	720	*	5214	*	0	197	31881	37052	*	69131	*	74345
NE	63	323	319	224	42	0	*	971	*	0	0	27666	34695	*	62361	*	63332
ENE	33	9	0	2206	105	0	*	2353	*	19592	0	1908	102844	*	124344	*	126697
E	0	0	103	3656	886	3532	*	8177	*	585801	522666	113943	0	*	1222410	*	1230587
ESE	0	0	62	3204	1977	18155	*	23398	*	92800	379657	23356	7502	*	503314	*	526713
SE	0	0	27	846	3062	12670	*	16605	*	791	5979	7314	4437	*	18522	*	35127
SSE	0	0	0	0	0	3196	*	3196	*	2956	4320	13584	5052	*	25912	*	29109
S	0	0	0	0	0	443	*	443	*	9598	15080	14647	0	*	39325	*	39768
SSW	0	0	0	0	0	0	*	0	*	2348	16275	99737	4424	*	122785	*	12785
SW	0	0	0	0	0	0	*	0	*	834	36074	9677	265	*	46851	*	46851
WSW	0	10	0	0	0	0	*	10	*	2560	26113	7542	47859	*	84074	*	84084
W	26	322	0	21	0	934	*	1303	*	6741	2994	15176	6988	*	31900	*	33204
WMW	232	435	174	921	2650	8060	*	12472	*	11018	15089	68449	13032	*	107588	*	120059
NW	99	104	858	1405	1487	13012	*	16965	*	127	9279	31837	172941	*	214184	*	231148
NNW	0	0	293	1294	1449	4352	*	7388	*	0	10485	23986	16462	*	50932	*	58321
TOTAL	453	1864	3362	16599	16423	70695	*	109396	*	735167	1046794	554306	473566	*	2809833	*	2919229

WSES-FSAR-UNIT-3

TABLE 2.1-2

TOWNS WITH OVER 1,000 PERSONS WITHIN 10 MILES OF WATERFORD 3

	<u>1960 Population</u>	<u>1970 Population</u>	<u>Estimated 1977 Population</u>
<u>St Charles Parish</u>			
Hahnville	1,297	2,483	2,655
Killona	NA	NA	1,203
Luling	2,122	3,255	3,760
Mimosa Park	NA	1,624	1,877
Norco	4,682	4,773	5,236
St. Rose	1,099	2,106	2,432
<u>St John the Baptist Parish</u>			
Garyville	2,389	2,474	2,710
Laplace	3,541	5,953	6,521
Reserve	5,297	6,381	6,990

Note: 1977 population estimates assume that the boundaries have remained the same as in 1970.

Sources: 1960 and 1970 data from: 1970 U S Census of Population, Number of Inhabitants, Louisiana, Table 10.

1977 data derived by methodologies described in Subsection 2.1.3.7.

WSES-FSAR-UNIT-3

TABLE 2.1-3

CITIES, TOWNS, AND COMMUNITIES WITH OVER 10,000 PERSONS
WITHIN 50 MILES OF WATERFORD 3

<u>City or Town</u>	<u>Parish</u>	<u>1960 Population</u>	<u>1970 Population</u>	<u>Estimated 1977 Population</u>
Baton Rouge	East Baton Rouge	NC	165,963	187,194
Bayou Cane	Terrebonne	3,173	9,077	10,134
Gretna	Jefferson	21,967	24,875	32,093
Hammond	Tangipahoa	NC	12,487	13,928
Harahan	Jefferson	9,275	13,037	16,821
Houma	Terrebonne	NC	30,922	34,522
Jefferson Heights	Jefferson	19,353	16,489	14,484
Kenner	Jefferson	NC	29,858	38,524
Little Farms	Jefferson	NA	15,713	20,273
Marrero	Jefferson	NA	29,015	37,436
Metairie	Jefferson	NA	106,523	137,438
Morgan City	St Mary	NC	16,586	18,527
New Orleans	Orleans	627,525	593,471	562,560
Scotlandville	East Baton Rouge	NA	22,557	25,443
Slidell	St. Tammany	NC	16,101	19,586
Terrytown	Jefferson	NA	13,832	17,486
Thibodaux	Lafourche	NC	14,922	16,342
Westwego	Jefferson	NC	11,402	14,711

NA = Not available

NC = Not comparable because of boundary changes

Note: 1977 population estimates assume that the boundaries have remained the same as in 1970.

Sources: 1960 and 1970 data from: 1970 U S Census of Population, Number of Inhabitants, Louisiana, Table 10.

1977 data derived by methodologies described in Subsection 2.1.3.7.

WSES-FSAR-UNIT-3

TABLE 2.1-4

Revision 309 (06/16)

TOTAL ESTIMATED PEAK DAILY AND SEASONAL TRANSIENT POPULATION 1977 AND 2030

→(LBDCR 15-005, R309)

<u>Activity</u>	<u>1977</u>	<u>%</u>	<u>2030</u>	<u>%</u>
Transportation	78,598	65.8	214,749	72.1
Recreation	35,500	29.7	51,108	17.1
Industrial	5,348	4.5	32,153	10.8
Total	119,446	100.0	298,010	100.0

←(LBDCR 15-005, R309)

WSES-FSAR-UNIT-3

TABLE 2.1-5 (Sheet 1 of 8)

1977

PEAK DAILY AND SEASONAL TRANSIENT POPULATION WITHIN 10 MILES OF WATERFORD 3*

SECTOR

	1977	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
ANNULUS	1		56				375	269	29						46			775
	2						613	326										939
	3				180	60	245	123										608
	4				95	130												225
	5	3,000			420	287	2,500											6,207
	10				23	58	13,206	250	79						2,895	5,583	10000	32,094
	Total	3,000	56		718	535	16,939	968	108						2,941	5,583	10000	40,848

* Does not include transient population related to transportation facilities

** Blank spaces means zero population

WSES-FSAR-UNIT-3

TABLE 2.1-5 (Sheet 2 of 8)

1980

PEAK DAILY AND SEASONAL TRANSIENT POPULATION WITHIN 10 MILES OF WATERFORD 3*

SECTOR

	1980	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
	1		56				395	287	37						46			821
	2						616	329										945
	3				192	64	248	125										629
ANNULUS	4				103	137												240
	5	3,000			504	327	2,500											6,331
	10				24	68	13,647	340	84					12	2,949	5,735	10396	33,255
	Total	3,000	56		823	596	17,406	1,081	121					12	2,995	5,735	10396	42,221

* Does not include transient population related to transportation facilities

** Blank spaces means zero population

WSES-FSAR-UNIT-3

TABLE 2.1-5 (Sheet 3 of 8)

1981

PEAK DAILY AND SEASONAL TRANSIENT POPULATION WITHIN 10 MILES OF WATERFORD 3*

SECTOR

	1981	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
	1		56				395	287	38						46			822
	2						616	330										946
	3				192	64	250	126										632
ANNULUS	4				103	137												240
	5	3,000			504	327	2,500											6,331
	10				24	72	13,818	399	87					20	2,964	5,759	10,557	33,700
	Total	3,000	56		823	600	17,579	1,142	125					20	3,010	5,759	10,557	42,671

* Does not include transient population related to transportation facilities

** Blank spaces means zero population

WSES-FSAR-UNIT-3

TABLE 2.1-5 (Sheet 4 of 8)

1990

PEAK DAILY AND SEASONAL TRANSIENT POPULATION WITHIN 10 MILES OF WATERFORD 3*

SECTOR

ANNULUS

1990	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
1		56				395	287	51						46			835
2						616	347	28	10				28	53	53		1,135
3				192	66	269	139					43	53	53	38		853
4				103	137												240
5	3,000			504	327	2,500											6,331
10				24	118	15,389	1,118	129					116	3,144	6,055	11,924	38,017
Total	3,000	56		823	648	19,169	1,891	208	10			43	197	3,296	6,146	11,924	47,411

* Does not include transient population related to transportation facilities

** Blank spaces means zero population

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TABLE 2.1-5 (Sheet 5 of 8)

2000

PEAK DAILY AND SEASONAL TRANSIENT POPULATION WITHIN 10 MILES OF WATERFORD 3*

SECTOR

ANNULUS

2000	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
1		56				395	287	67	10					46			861
2						616	368	57	21				57	109	109		1,337
3				192	69	293	155	10				89	109	109	78		1,104
4				103	137												240
5	3,000			504	327	2,500	16										6,347
10				24	177	16,847	2,037	183					239	3,374	6,433	13,122	42,436
Total	3,000	56		823	710	20,651	2,863	317	31			89	405	3,638	6,620	13,122	52,325

* Does not include transient population related to transportation facilities

** Blank spaces means zero population

WSES-FSAR-UNIT-3

TABLE 2.1-5 (Sheet 6 of 8)

2010

PEAK DAILY AND SEASONAL TRANSIENT POPULATION WITHIN 10 MILES OF WATERFORD 3*

SECTOR

	2010	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
	1		56				395	287	93	19					46			896
	2						616	403	105	39				105	201	201		1,670
	3				192	73	332	181	19				163	201	201	144		1,506
ANNULUS	4				103	137												240
	5	3,000			504	327	2,500	29										6,360
	10				24	273	18,772	3,540	271					441	3,751	7,051	14,623	48,746
	Total	3,000	56		823	810	22,615	4,440	488	58			163	747	4,199	7,396	14,623	59,418

* Does not include transient population related to transportation facilities

** Blank spaces means zero population

WSES-FSAR-UNIT-3

TABLE 2.1-5 (Sheet 7 of 8)

2020

PEAK DAILY AND SEASONAL TRANSIENT POPULATION WITHIN 10 MILES OF WATERFORD 3*

SECTOR

ANNULUS

2020	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
1		56				395	287	133	32					46			949
2						616	456	178	66				178	341	341		2,176
3				192	80	392	221	32				276	341	341	244		2,119
4				103	137												240
5	3,000			504	327	2,500	49										6,380
10				24	420	21,294	5,830	405					748	4,325	7,992	16,497	57,535
Total	3,000	56		823	964	25,197	6,843	748	98			276	1,267	5,053	8,577	16,497	69,399

* Does not include transient population related to transportation facilities

** Blank spaces means zero population

WSES-FSAR-UNIT-3

TABLE 2.1-5 (Sheet 8 of 8)

2030

PEAK DAILY AND SEASONAL TRANSIENT POPULATION WITHIN 10 MILES OF WATERFORD 3*

SECTOR

ANNULUS

2030	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
1		56				395	287	194	52					46			1,030
2						616	537	290	107				290	555	555		2,950
3				192	90	484	282	52				449	555	555	397		3,056
4				103	137												240
5	3,000			504	327	2,500	80										6,411
10				24	644	24,461	9,318	608					1,216	5,200	9,426	18,677	69,574
Total	3,000	56		823	1,198	28,456	10,504	1,144	159			449	2,061	6,356	10,378	18,677	83,261

* Does not include transient population related to transportation facilities

** Blank spaces means zero population

WSES-FSAR-UNIT-3

TABLE 2.1-6

ESTIMATED AVERAGE SUNDAY PARTICIPATED IN RECREATIONAL ACTIVITY
WITHIN TEN MILES OF WATERFORD 3

<u>Activity</u>	<u>Year</u>							
	<u>1977</u>	<u>1980</u>	<u>1981</u>	<u>1990</u>	<u>2000</u>	<u>2010</u>	<u>2020</u>	<u>2030</u>
Boating	987	1047	1069	1295	1594	1062	2415	2973
Fishing	1653	1804	1863	2503	3463	4791	6629	9171
Swimming	1496	1617	1663	2168	2885	3839	5109	6799
Camping	423	457	470	613	815	1085	1445	1923
Walking	1911	2058	2117	2760	3569	4751	6323	8416
Horseback Riding	207	224	230	302	405	544	731	983
Golf	248	269	277	360	479	637	848	1128
Tennis	334	361	371	484	650	874	1174	1578
Motorcycling	410	443	456	594	798	1072	1140	1935
Bicycling	1259	1358	1398	1821	2447	3387	4553	6118
Picnicking	438	474	488	635	853	1146	1541	2071
Birdwatching	323	349	359	468	628	845	1135	1525
Driving	2251	2427	2500	3254	4373	5877	7898	10614
Play Baseball	523	564	580	757	1030	1385	1861	2501
Play Basketball	378	408	420	548	736	989	1330	1787
Play Volleyball	275	300	309	402	540	726	975	1310
Play Football	443	478	492	641	861	1157	1555	2090
Hunting	1034	1116	1149	1497	2011	2703	3633	4883
Watching Baseball	604	652	671	875	1175	1580	2123	2854
Watching Golf	57	62	63	83	111	149	200	269
Watching Auto Racing	86	93	95	125	168	225	302	406
Watching Tennis	150	134	135	145	157	170	180	199
Watching Horse Racing	151	163	168	219	294	395	531	714
Watch Outdoor Concert	72	78	80	105	141	189	254	342
Watching Football	703	797	813	986	1479	1821	2241	2758
Totals	16416	17733	18236	23640	31662	42299	56430	75247

Source: State of Louisiana, Outdoor Recreation Plan, State Parks and Recreation Commission, June 1974.

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TABLE 2.1-7 (Sheet 1 of 8)

1977

COMBINED DAILY AND SEASONAL RECREATIONAL TRANSIENT POPULATION WITHIN 10 MILES OF WATERFORD 3

SECTOR

	1977	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
ANNULUS	1																	
	2																	
	3																	
	4																	
	5	3,000					2,500											5,500
	10						12,500								2,500	5,000	10,000	30,000
	Total	3,000					15,000								2,500	5,000	10,000	35,500

**Blank spaces means zero population

WSES-FSAR-UNIT-3

TABLE 2.1-7 (Sheet 2 of 8)

1980

COMBINED DAILY AND SEASONAL RECREATIONAL TRANSIENT POPULATION WITHIN 10 MILES OF WATERFORD 3

SECTOR

	1980	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
	1																	
	2																	
	3																	
ANNULUS	4																	
	5	3,000					2,500											5,500
	10						12,895								2,500	5,000	10,396	30,791
	Total	3,000					15,395								2,500	5,000	10,396	36,291

**Blank spaces means zero population

WSES-FSAR-UNIT-3

TABLE 2.1-7 (Sheet 3 of 8)

1981

COMBINED PEAK DAILY AND SEASONAL RECREATIONAL TRANSIENT POPULATION WITHIN 10 MILES OF WATERFORD 3

SECTOR

	1981	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
	1																	
	2																	
	3																	
ANNULUS	4																	
	5	3,000					2,500											5,500
	10						13,041								2,500	5,000	10,542	31,083
	Total	3,000					15,541								2,500	5,000	10,542	36,583

**Blank spaces means zero population

WSES-FSAR-UNIT-3

TABLE 2.1-7 (Sheet 4 of 8)

1990

COMBINED PEAK DAILY AND SEASONAL RECREATIONAL TRANSIENT POPULATION WITHIN 10 MILES OF WATERFORD 3

SECTOR

	1990	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
	1																	
	2																	
	3																	
	4																	
ANNULUS	5	3,000					2,500											5,500
	10						14,340								2,500	5,000	11,840	33,680
	Total	3,000					16,840								2,500	5,500	11,840	39,180

**Blank spaces means zero population

WSES-FSAR-UNIT-3

TABLE 2.1-7 (Sheet 5 of 8)

2000

COMBINED PEAK DAILY AND SEASONAL RECREATIONAL TRANSIENT POPULATION WITHIN 10 MILES OF WATERFORD 3

SECTOR

	2000	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
	1																	
	2																	
	3																	
	4																	
ANNULUS	5	3,000					2,500											5,500
	10						15,450								2,500	5,000	12,950	35,900
	Total	3,000					17,950								2,500	5,000	12,950	41,400

**Blank spaces means zero population

WSES-FSAR-UNIT-3

TABLE 2.1-7 (Sheet 6 of 8)

2010

COMBINED PEAK DAILY AND SEASONAL RECREATIONAL TRANSIENT POPULATION WITHIN 10 MILES OF WATERFORD 3

SECTOR

	2010	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
	1																	
	2																	
	3																	
ANNULUS	5																	
	5	3,000					2,500											5,500
	10						16,805								2,500	5,000	14,306	38,611
	Total	3,000					19,305								2,500	5,000	14,306	44,111

**Blank spaces means zero population

WSES-FSAR-UNIT-3

TABLE 2.1-7 (Sheet 7 of 8)

2020

Revision 309 (06/16)

COMBINED PEAK DAILY AND SEASONAL RECREATIONAL TRANSIENT POPULATION WITHIN 10 MILES OF WATERFORD 3

SECTOR

→(LBDCR 15-005 , R309)

ANNULUS

2020	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
1																	
2																	
3																	
4																	
5	3,000					2,500											5,500
10						18,459								2,500	5,000	15,960	41,919
Total	3,000					20,959								2,500	5,000	15,960	47,419

←(LBDCR 15-005, R309)

**Blank spaces means zero population

WSES-FSAR-UNIT-3

TABLE 2.1-7 (Sheet 8 of 8)

2030

COMBINED PEAK DAILY AND SEASONAL RECREATIONAL TRANSIENT POPULATION WITHIN 10 MILES OF WATERFORD 3

SECTOR

	2030	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
	1																	
	2																	
	3																	
	4																	
ANNULUS	5	3,000					2,500											5,500
	10						20,304								2,500	5,000	17,804	45,608
	Total	3,000					22,804								2,500	5,000	17,804	51,108

**Blank spaces means zero population

WSES-FSAR-UNIT-3

TABLE 2.1-8

TRANSPORTATION TRANSIENT POPULATION WITHIN 10 MILES OF WATERFORD 3
(Passengers per day)

Highways	1977	1980	1981	1990	2000	2010	2020	2030
Int 10	16,092	16,683	17,087	19,040	21,473	24,217	27,312	30,803
La 18	4,393	4,554	4,609	5,136	5,792	6,532	7,367	8,309
La 44	2,333	2,419	2,448	2,728	3,077	3,470	3,913	4,413
La 48	4,833	5,011	5,072	5,652	6,374	7,189	8,108	9,144
La 49	5,319	5,514	5,581	6,219	7,014	7,910	8,921	10,061
La 53	4,947	5,129	5,191	5,784	6,523	7,357	8,297	9,357
La 54	1,081	1,121	1,135	1,265	1,427	1,609	1,815	2,047
Int 55	NA	NA	NA	10,900	12,293	13,864	15,636	17,635
US 61	13,024	13,503	13,666	15,228	17,174	19,369	21,844	24,636
US 90	12,304	12,756	14,214	16,031	18,080	20,391	22,997	25,936
Int 410	*	*	*	NA	12,400	13,985	15,772	17,788
La 626	2,114	2,192	2,219	2,473	2,789	3,145	3,547	4,000
La 628	3,099	3,213	3,252	3,624	3,681	4,151	4,682	5,280
La 3127	1,012	1,049	1,062	1,183	1,334	1,504	1,696	1,913
Sub Total	70,551	73,144	75,536	95,263	119,431	134,693	151,907	171,322
Ships, Including Ferries	7,514	8,210	8,456	11,144	14,977	20,128	27,050	36,354
Rail	533	617	647	1,005	1,637	2,666	4,342	7,073
Total	78,598	1,971	84,639	107,412	136,045	157,487	183,299	214,749

NA - Not Available.

* - Highway not completed.

WSES-FSAR-UNIT-3

TABLE 2.1-9 (Sheet 1 of 8)

1977

PEAK DAILY INDUSTRIAL EMPLOYMENT WITHIN 10 MILES OF WATERFORD 3

SECTOR

	1977	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
	1		56				375	269	29						46			775
	2						613	326										939
	3				180	60	245	123										608
ANNULUS	4				95	130												225
	5				420	287												707
	10				23	58	706	250	79						395	583		2,094
	Total		56		718	535	1,939	968	108						451	583		5,348

** Blank spaces means zero population

WSES-FSAR-UNIT-3

TABLE 2.1-9 (Sheet 2 of 8)

1980

PEAK DAILY INDUSTRIAL EMPLOYMENT WITHIN 10 MILES OF WATERFORD 3

SECTOR

	1980	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
	1		56				395	287	37						46			821
	2						616	329										945
	3				192	64	248	125										629
ANNULUS	4				103	137												240
	5				504	327												831
	10				24	68	752	340	84					12	449	735		2,464
	Total		56		823	596	2,011	1,081	121					12	495	735		5,930

** Blank spaces means zero population

WSES-FSAR-UNIT-3

TABLE 2.1-9 (Sheet 3 of 8)

1981

PEAK DAILY INDUSTRIAL EMPLOYMENT WITHIN 10 MILES OF WATERFORD 3

SECTOR

	1981	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
	1		56				395	287	38						46			822
	2						616	330										946
	3				192	64	250	126										632
ANNULUS	4				103	137												240
	5				504	327												831
	10				24	72	777	399	87					20	464	759	15	2,617
	Total		56		823	600	2,038	1,142	125					20	510	759	15	6,088

** Blank spaces means zero population

WSES-FSAR-UNIT-3

TABLE 2.1-9 (Sheet 4 of 8)

1990

PEAK DAILY INDUSTRIAL EMPLOYMENT WITHIN 10 MILES OF WATERFORD 3

SECTOR

	1990	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
	1		56				395	287	51						46			835
	2						616	347	28	10				28	53	53		1,135
	3				192	66	269	139					43	53	53	38		853
ANNULUS	4				103	137												240
	5				504	327												831
	10				24	118	1,049	1,118	129					116	644	1,055	84	4,337
	Total		56		823	648	2,329	1,891	208	10			43	197	796	1,146	84	8,231

** Blank spaces means zero population

WSES-FSAR-UNIT-3

TABLE 2.1-9 (Sheet 5 of 8)

2000

PEAK DAILY INDUSTRIAL EMPLOYMENT WITHIN 10 MILES OF WATERFORD 3

SECTOR

	2000	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
	1		56				395	287	67	10					46			861
	2						616	368	57	21				57	109	109		1,137
	3				192	69	293	155	10				89	109	109	78		1,104
ANNULUS	4				103	137												240
	5				504	327		16										847
	10				24	177	1,397	2,037	183					239	874	1,433	172	6,536
	Total		56		823	710	2,701	2,863	317	31			89	405	1,138	1,620	172	10,925

** Blank spaces means zero population

WSES-FSAR-UNIT-3

TABLE 2.1-9 (Sheet 6 of 8)

2010

PEAK DAILY INDUSTRIAL EMPLOYMENT WITHIN 10 MILES OF WATERFORD 3

SECTOR

	2010	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
	1		56				395	287	93	19					46			896
	2						616	403	105	39				105	201	201		1,670
	3				192	73	332	181	19				163	201	201	144		1,506
ANNULUS	4				103	137												240
	5				504	327		29										860
	10				24	273	1,967	3,540	271					441	1,251	2,051	317	10,135
	Total		56		823	810	3,310	4,440	488	58			163	747	1,699	2,396	317	15,307

** Blank spaces means zero population

WSES-FSAR-UNIT-3

TABLE 2.1-9 (Sheet 7 of 8)

2020

PEAK DAILY INDUSTRIAL EMPLOYMENT WITHIN 10 MILES OF WATERFORD 3

SECTOR

	2020	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
	1		56				395	287	133	32					46			949
	2						616	456	178	66				178	341			2,176
	3				192	80	392	221	32				276	341	341	244		2,119
ANNULUS	4				103	137												240
	5				504	327		49										880
	10				24	420	2,835	5,830	405					748	1,825	2,992	537	15,616
	Total		56		823	964	4,238	6,843	748	98			276	1,267	2,553	3,577	537	21,980

** Blank spaces means zero population

WSES-FSAR-UNIT-3

TABLE 2.1-9 (Sheet 8 of 8)

2030

PEAK DAILY INDUSTRIAL EMPLOYMENT WITHIN 10 MILES OF WATERFORD 3

SECTOR

	2030	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WS W	W	WNW	NW	NN W	TOTAL
	1		56				395	387	194	52					46			1,030
	2						616	537	290	107				290	555	555		2,950
	3				192	90	484	282	52				449	555	397			3,056
ANNULUS	4				103	137												240
	5				504	327		80										911
	10				24	644	4,157	9,318	608					1,216	2,700	4,426	873	23,966
	Total		56		823	1,198	5,652	10,504	1,144	159			449	2,061	3,856	5,378	873	32,153

** Blank spaces means zero population

WSES-FSAR-UNIT-3

TABLE 2.1-10

CUMULATIVE POPULATION DENSITY BY SECTORS WITHIN 30 MILES OF WATERFORD UNIT 3, 1981

		N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Total
Cumulative Population	Annulus																	
	0-1	0	0	63	33	0	0	0	0	0	0	0	0	26	232	99	0	453
	0-2	186	178	235	33	0	0	0	0	0	0	0	10	348	667	203	0	1,860
	0-3	529	248	241	33	103	29	27	0	0	0	0	10	248	671	345	22	2,606
	0-4	1,435	627	263	2,239	3,491	1,480	116	0	0	0	0	10	369	696	382	548	11,656
	0-5	3,631	1,010	267	2,344	4,124	2,651	708	0	0	0	0	10	369	733	774	1,925	18,546
	0-10	6,941	1,434	267	2,344	5,676	10,630	6,277	1,405	195	0	0	10	919	5,479	8,437	4,488	54,503
	0-20	6,941	1,434	267	10,884	249,580	51,095	6,625	2,704	4,541	1,662	590	2,293	6,799	14,955	8,512	4,488	373,371
	0-30	8,467	1,562	267	10,884	797,066	237,538	9,231	5,760	15,725	12,990	24,770	21,173	9,623	22,119	12,215	8,481	1,197,880
Cumulative Population Density	Annulus																	
	0-1	0	0	315.0	165.0	0	0	0	0	0	0	0	0	130.0	1,160.0	495.0	0	144.3
	0-2	235.4	225.3	297.5	41.8	0	0	0	0	0	0	0	12.7	440.5	844.3	257.0	0	148.0
	0-3	298.9	140.1	136.2	18.6	58.2	16.4	15.3	0	0	0	0	5.6	196.6	379.1	194.9	12.4	92.2
	0-4	457.0	199.7	83.8	713.1	1,111.8	471.3	36.9	0	0	0	0	3.2	117.5	221.7	121.7	174.5	231.9
	0-5	739.5	205.7	54.4	477.4	839.9	539.9	144.2	0	0	0	0	2.0	75.2	149.3	157.6	392.1	236.1
	0-10	353.6	73.1	13.6	119.4	289.1	541.5	319.8	71.6	9.9	0	0	0.5	46.8	279.1	429.8	228.6	173.5
	0-20	88.4	18.3	3.4	138.6	3,177.7	650.6	84.4	34.4	57.8	21.2	7.5	29.2	86.6	190.4	108.4	57.1	297.1
	0-30	47.9	8.8	1.5	61.6	4,510.6	1,344.2	52.2	32.6	89.0	73.5	140.2	119.8	54.5	125.2	69.1	48.0	423.7
Cumulative Population Density Compared with a Density of 500	Annulus																	
	0-1	-500.0	-500.0	-185.0	-335.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-370.0	+660.0	-5.0	-500.0	-355.7

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TABLE 2.1-11

CUMULATIVE POPULATION DENSITY BY SECTORS WITHIN 30 MILES OF WATERFORD UNIT 3, 2030

		N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Total
Cumulative Population	Annulus																	
	0-1	0	0	63	3	0	0	0	0	0	0	0	0	26	232	99	0	453
	0-2	299	362	386	42	0	0	0	0	0	0	0	10	348	667	203	0	1,860
	0-3	905	1,282	705	42	103	62	27	0	0	0	0	10	348	841	1,061	293	5,979
	0-4	2,234	2,775	929	2,248	3,759	3,266	873	0	0	0	0	10	369	1,762	2,466	1,587	22,278
	0-5	5,280	4,494	971	2,353	4,645	5,243	3,935	0	0	0	0	10	369	4,412	3,953	3,036	38,701
	0-10	10,900	5,214	971	2,353	8,177	23,398	16,605	3,196	443	0	0	10	1,303	12,472	16,965	7,388	109,396
	0-20	10,900	5,214	971	21,945	593,978	116,198	17,396	6,152	10,041	2,348	834	2,570	8,044	23,490	17,092	7,388	844,562
	0-30	13,485	5,411	971	21,945	1,116,644	495,855	23,375	10,472	25,121	18,623	36,908	28,683	11,038	38,579	26,371	17,873	1,891,354
Cumulative Population Density	Annulus																	
	0-1	0	0	315.0	165.0	0	0	0	0	0	0	0	0	130.0	1,160.0	495.0	0	144.3
	0-2	378.5	458.2	488.6	53.2	0	0	0	0	0	0	0	12.7	440.5	844.3	257.0	0	184.3
	0-3	511.3	724.3	398.3	23.7	58.2	35.0	15.3	0	0	0	0	5.6	196.6	475.1	599.4	165.5	211.5
	0-4	711.5	883.8	295.9	715.9	1,197.1	1,040.1	278.0	0	0	0	0	3.2	117.5	561.1	795.4	505.4	443.2
	0-5	1,075.4	915.3	197.8	479.2	946.0	1,067.8	801.4	0	0	0	0	2.0	75.2	898.6	805.1	618.3	492.8
	0-10	555.3	265.6	49.5	119.9	416.6	1,192.0	845.9	162.8	22.6	0	0	0.5	66.4	635.4	864.2	376.4	348.2
	0-20	138.8	66.4	12.4	279.4	7,562.7	1,479.5	221.5	78.3	127.8	29.9	10.6	32.7	102.4	299.1	217.6	94.1	672.1
	0-30	76.3	30.6	5.5	124.2	6,319.1	2,806.0	132.3	59.3	142.2	105.4	208.9	162.3	62.5	218.3	149.2	101.1	668.9
Cumulative Population Density Compared with a Density of 1,000 Persons per sq. mi.	Annulus																	
	0-1	-1,000.0	-1,000.0	-685.0	-835.0	-1,000.0	-1,000.0	-1,000.0	-1,000.0	-1,000.0	-1,000.0	-1,000.0	-1,000.0	-870.0	+160.0	-505.0	-1,000.0	-855.7

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TABLE 2.1-12

MAJOR TRANSPORTATION FACILITIES WITHIN THE LPZ

<u>Facility</u>	<u>Nearest Distance to Site (miles)</u>	<u>Average Number of Persons per Day (1977)</u>
La Highway 18	0.1	4,393 ⁽¹⁾
La Highway 628	0.7	3,099 ⁽¹⁾
La Highway 3127	1.0	1,012 ⁽¹⁾
Mississippi River	0.2	3,962 ^{(2)(3)*}
Missouri Pacific R R	0.5	72 ⁽⁴⁾

- (1) Department of Transportation and Development Office of Highways, Baton Rouge, La., 1977.
- (2) U.S. Department of the Army, Waterborne Commerce of the United States, Part 2, Waterways and Harbors, Gulf Coast, Mississippi River System, Antilles, New Orleans, La., 1976.
- (3) Personal Communication: New Orleans-Baton Rouge Steamship Pilots Association, New Orleans, La., June 1977; Delta Queen Steamboat Co., Cincinnati, Ohio, June 1977; Arkansas Explorer, Little Rock, Arkansas, June 1977; Dock Board, Port of New Orleans, New Orleans, La., June 1977.
- (4) Personal Communication, Missouri Pacific Railroad, Avondale, La., June 1977.

*Represents a peak daily, not an average number.

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TABLE 2.1-13

1977 PEAK DAILY POPULATION DISTRIBUTION WITHIN THE LOW POPULATION ZONE

By Annular Sector

	<u>N</u>	<u>NNE</u>	<u>NE</u>	<u>ENE</u>	<u>E</u>	<u>ESE</u>	<u>SE</u>	<u>SSE</u>	<u>S</u>	<u>SSW</u>	<u>SW</u>	<u>WSW</u>	<u>W</u>	<u>WNW</u>	<u>NW</u>	<u>NNW</u>	Annulus Totals
Resident Population																	
Mile 1	0	0	63	33	0	0	0	0	0	0	0	0	26	232	99	0	453
Mile 2	<u>171</u>	<u>154</u>	<u>150</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>307</u>	<u>435</u>	<u>104</u>	<u>0</u>	<u>1,321</u>
Sub Total	171	154	213	33	0	0	0	0	0	0	0	0	333	667	203	0	1,774
Transient Population																	
Mile 1	0	46	0	0	0	375	269	29	0	0	0	0	0	32	0	0	751
Mile 2	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>613</u>	<u>326</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>939</u>
Sub Total	0	46	0	0	0	988	595	29	0	0	0	0	0	32	0	0	1,690
Peak Daily* Population																	
Mile 1	0	46	63	33	0	375	269	29	0	0	0	0	26	264	99	0	1,204
Mile 2	<u>171</u>	<u>154</u>	<u>150</u>	<u>0</u>	<u>0</u>	<u>613</u>	<u>326</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>307</u>	<u>435</u>	<u>104</u>	<u>0</u>	<u>2,260</u>
Sector Totals	171	200	213	33	0	988	595	29	0	0	0	0	333	699	203	0	3,464

*Combination of resident and average daily transient population.

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TABLE 2.1-14

SUMMARY COMPARISON OF DEMOGRAPHIC METHODOLOGIES

<u>Methodology</u>	<u>Population Estimates and Projections Prepared For</u>	<u>Basis of Population Estimates & Projections</u>	<u>Methodology Summary</u>
A	Annular Sectors 5 to 50 miles from plant; Total area within 5 miles of plant	University of New Orleans population projections by Parish to the year 2000; interpolations and extrapolations of those figures.	-Parish subdivisions (U.S. Census) taken as percent of 1970 parish popu- lations; resultant factors applied to parish popula- tion estimates for 1977 and projection years to 2030. -Allocation of population to annular sectors based upon measurement of area of parish subdivisions within each annular sector.
B	Annular Sectors within 5 miles of plant	Total population within 5 miles of plant as esti- mated and projected in Methodology A.	-Allocation of population to annular sectors based upon relative suitability of land for future resi- dential development. -Factors defining relative suitability included: ac- cessibility to New Orleans soils capability, flood hazard, present use, zon- ing, public services.

WSES-FSAR-UNIT-3

TABLE 2.1-15

CORRELATION AND REGRESSION OF GROWTH RATES VERSUS
DEVELOPMENT SUITABILITY WITHIN FIVE
MILES OF WATERFORD 3, 1973-1977

<u>Area</u>	<u>Change in Number of Dwelling Units, 1973-1977</u>	<u>Change in Dwelling Units per Unit of Area*</u>	<u>Average Development Suitability</u>
LaPlace	+223	+7.99	1.1
Lucy-Edgard	+45	+1.79	8.5
Killona	+61	+3.65	7.3
Hahnville	+157	+6.38	4.7

Regression equation: $Y = 9.37 - .818 X$

Correlation coefficient: $r = -.969$

* One unit of area = approximately 91.8 acres.

- Sources:
- 1977 dwelling unit count from analysis of aerial photography and field checks
 - 1973 dwelling unit counts estimated from information contained in:
 - Population Study, St. Charles Parish, Louisiana, N-Y Associates, Metairie, La., February 1974.
 - Population Study, St. John the Baptist Parish, Louisiana, N-Y Associates, Metairie, La., February 1974.

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TABLE 2.1-16

PROBABILITY OF RESIDENTIAL DEVELOPMENT WITHIN
DIFFERENT LEVELS OF DEVELOPMENT SUITABILITY

Level of Development	Probability of Residential Development		
<u>Suitability</u> ⁽¹⁾	<u>1977-1981</u>	<u>1990-2020</u> ⁽²⁾	<u>2030</u> ⁽³⁾
1	16.7%	24.5%	29.9%
2	15.2%	22.3%	26.4%
3	13.7%	20.1%	23.8%
4	12.1%	17.7%	20.9%
5	10.6%	15.5%	0
6	9.1%	0	0
7	7.6%	0	0
8	6.0%	0	0
9	4.5%	0	0
10	2.9%	0	0
11	1.4%	0	0
12	0.2%	0	0

(1) The lowest number = the highest development suitability.

(2) Land within levels of development suitability 6-12 was not available after 1981 because of highway improvements which changed the levels of suitability throughout the study area. The probabilities were accordingly re-calculated.

(3) Land within suitability level 5 was considered used up after 2020.