August 13, 2024

L-2024-132
10 CFR 50, Appendix E

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, D. C. 20555

Re: St. Lucie Units 1 and 2
Docket Nos. 50-335 and 50-389
2024 Population Update Analysis

Pursuant to 10 CFR 50, Appendix E, Section IV, St. Lucie is submitting an annual estimate of the permanent resident population within the Emergency Planning Zone (EPZ). Section IV of Appendix E requires the licensee to estimate EPZ permanent resident population changes once per year and to submit the estimates to the NRC with any updated Evacuation Time Estimate (ETE) analysis.

Based on the population analysis, the EPZ has grown enough at this time to require a full ETE update. As such, a full ETE has been completed and is enclosed with this submittal.

This letter contains no new regulatory commitments.

Should you have any questions regarding this submittal, please contact Mr. Kenneth Mack, Senior Manager, Licensing and Regulatory Compliance, at 561-904-3635.

Sincerely,

Paul Rasmus
General Manager, Regulatory Affairs

Enclosure: St. Lucie 2024 Population Update Analysis - Evacuation Time Estimate

cc: Mr. Clark Eldredge, Florida Department of Health
USNRC Regional Administrator, Region II
USNRC Senior Resident Inspector, St. Lucie Units 1 and 2

ENCLOSURE

ST. LUCIE 2024 POPULATION UPDATE ANALYSIS - EVACUATION TIME ESTIMATE

(18 pages follow)

EXECUTIVE SUMMARY

This report describes the analyses undertaken and the results obtained by a study to develop Evacuation Time Estimates (ETE) for the St. Lucie Nuclear Power Plant (St. Lucie) located in Jensen Beach, St. Lucie County, Florida. The ETE are part of the required planning basis and provide Florida Power and Light (FPL) and the state and local governments (offsite response organizations - OROs) with site-specific information needed for protective action decision-making.

In the performance of this effort, guidance is provided by documents published by Federal Governmental agencies. Most important of these are:

- Title 10, Code of Federal Regulations, Appendix E to Part 50 (10CFR50), Emergency Planning and Preparedness for Production and Utilization Facilities, NRC, 2011.
- Criteria for Development of Evacuation Time Estimate Studies, NUREG/CR-7002, Rev. 1, February 2021.
- Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants, NUREG 0654/Radiological Emergency Preparedness Program Manual, FEMA P-1028, December 2023.

Project Activities

This project began in January 2024 and extended over a period of approximately 6 months. The major activities performed are briefly described in chronological sequence:

- Conducted a virtual kickoff meeting with FPL personnel and state and county emergency management agencies.
- Projected 2020 Census permanent resident population from the Census Bureau[1] website to 2024 using annual growth rates computed from the 2023 county population estimates and 2022 municipal population estimates.
- Estimated the number of employees commuting into the Emergency Planning Zone (EPZ) based on the US Census Longitudinal Employer-Household Dynamics (WAC) data from the OnTheMap[2] Census analysis tool and the plant employment data provided by FPL.
- Studied Geographic Information Systems (GIS) maps of the area in the vicinity of St. Lucie, then conducted a detailed field survey of highways, major evacuation routes and construction/developing areas to observe any roadway characteristics and changes relative to the previous ETE study done in 2022.
- Updated the analysis network representing the highway system topology and capacities within the EPZ, plus a Shadow Region covering the region between the EPZ boundary and approximately 15 miles radially from the plant.

[1] www.census.gov
[2] http://onthemap.ces.census.gov/

- Utilized the results of the 2021 demographic survey of residents within the EPZ to gather focused data needed for this ETE study that were not contained within the census database. The U.S. Census Bureau's American Community Survey (ACS)[3] average age and household size data for the counties within the EPZ for 2020 and 2022 were analyzed to validate that EPZ demographics have not significantly changed, thereby justifying the use of the 2021 demographic survey results in this ETE study (see Appendix F.2).
- A data needs matrix (requesting data) was provided to FPL and the OROs at the kickoff meeting. The data for St. Lucie plant employees, transients, and special facilities (i.e., schools, medical facilities and correctional facilities) gathered for the previous ETE study were reviewed and either confirmed or updated accordingly by the OROs. If updated information was not provided and could not be obtained from online sources, data gathered for the previous (2022) ETE study was utilized to supplement the data.
- The traffic demand and trip-generation rates of evacuating vehicles were estimated from the gathered data. The trip generation rates reflected the estimated mobilization time (i.e., the time required by evacuees to prepare for the evacuation trip) computed using the results of the demographic survey of EPZ residents.
- The existing 8 Areas within the EPZ were grouped within circular areas or "keyhole" configurations (circles plus radial sectors) that define a total of 13 Evacuation Regions (numbered R01 through R13), as per federal guidelines and as defined by the existing protective action recommendations (PAR).
- The time-varying external circumstances are represented as Evacuation Scenarios, each described in terms of the following factors: (1) Season (Summer, Winter); (2) Day of Week (Midweek, Weekend); (3) Time of Day (Midday, Evening); and (4) Weather (Good, Rain). One special event scenario involving Stuart Airshow was considered. One roadway impact scenario was considered wherein a single lane was closed on Interstate-95 (I-95) southbound from the interchange with SW St. Lucie West Blvd (Exit 121) to the interchange with State Route (SR)-714/Martin Highway (Exit 110), for the duration of the evacuation.
- Staged evacuation was considered for those regions wherein the 2-Mile Radius and Areas downwind to 5 miles are evacuated.
- As per NUREG/CR-7002, Rev. 1, the Planning Basis for the calculation of ETE is:
    - A rapidly escalating accident at the plant that quickly assumes the status of a general emergency wherein evacuation is ordered promptly, and no early protective actions have been implemented such that the Advisory to Evacuate (ATE) is virtually coincident with the siren notification.

[3] https://www.census.gov/programs-surveys/acs/data.html

  - While an unlikely accident scenario, this planning basis will yield ETE, measured as the elapsed time from the ATE until the stated percentage of the population exits the impacted Region, that represent "upper bound" estimates. This conservative Planning Basis is applicable for all initiating events.

- If the emergency occurs while schools are in session, the ETE study assumes that the schoolchildren will be evacuated by bus directly to school reception centers located outside the EPZ and will subsequently be picked up by parents or legal guardians, as stated in the 2022 Port St. Lucie Fact Sheet. Parents, relatives, and neighbors are advised to not pick up their children at school prior to the arrival of the buses dispatched for that purpose. The ETE for schoolchildren are calculated separately except for those at preschools or day care centers that are picked up by the parents or legal guardians.
- Evacuees who do not have access to a private vehicle will either rideshare with relatives, friends or neighbors, or be evacuated by buses provided by the counties in the EPZ. Those in medical facilities will likewise be evacuated with public transit, as needed: bus, wheelchair bus, or ambulance, as required. Separate ETE are calculated for the transit-dependent evacuees, for the disabilities and other access and functional needs population, and for those evacuated from medical facilities. (Correctional facilities shelter in place.)
- Conducted a virtual final meeting FPL personnel and emergency management personnel representing the OROs to present final results from the study.

Computation of ETE

A total of 156 ETE were computed for the evacuation of the general public. Each ETE quantifies the aggregate evacuation time estimated for the population within one of the 13 Evacuation Regions to evacuate from that Region, under the circumstances defined for one of the 12 Evacuation Scenarios (13 x 12 = 156). Separate ETE are calculated for transit-dependent evacuees, including schoolchildren and medical facility residents for applicable scenarios.

Except for Region R03, which is the evacuation of the entire EPZ, only a portion of the people within the EPZ would be advised to evacuate. That is, the ATE applies only to those people occupying the specified impacted region. It is assumed that 100% of the people within the impacted region will evacuate in response to the ATE. The people occupying the remainder of the EPZ outside the impacted region may be advised to take shelter.

The computation of ETE assumes that 20% of the population within the EPZ but outside the impacted region, will elect to "evacuate voluntarily". In addition, 20% of the population in the Shadow Region will also elect to evacuate. These voluntary and shadow evacuees could impede those who are evacuating from within the impacted region. The impedance that could be caused by voluntary and shadow evacuees is considered in the computation of ETE for the impacted region.

Staged evacuation is considered wherein those people within 2 miles of St. Lucie evacuate immediately, while those beyond 2 miles, but within the EPZ, shelter-in-place. Once 90% of the 2-Mile Radius is evacuated, those people beyond 2 miles begin to evacuate. As per federal guidance, the assumed 20% of people beyond 2 miles evacuate (non-compliance) even though they are advised to shelter-in-place during a staged evacuation.

The computational procedure is outlined as follows:

- A link-node representation of the highway network is coded. Each link represents a unidirectional length of highway; each node usually represents an intersection or merge point. The capacity of each link is estimated based on the field survey observations and on established traffic engineering procedures.
- The evacuation trips are generated at locations called "zonal centroids" located within the EPZ and Shadow Region. The trip generation rates vary over time reflecting the mobilization process, and from one location (centroid) to another depending on population density and on whether a centroid is within, or outside, the impacted area.
- The evacuation model computes the routing patterns for evacuating vehicles that are compliant with federal guidelines (outbound relative to the location of the plant), and then simulate the traffic flow movements over space and time. This simulation process estimates the rate that traffic flow exits the impacted region.

The ETE statistics provide the elapsed times for 90% and 100%, respectively, of the population within the impacted region, to evacuate from within the impacted region. These statistics are presented in tabular and graphical formats. The 90th percentile ETE have been identified as the values that should be considered when making protective action decisions because the 100th percentile ETE are prolonged by those relatively few people who take longer to mobilize. This is referred to as the "evacuation tail" in Section 4.0 of NUREG/CR-7002, Rev. 1.

Traffic Management

This study reviewed, modeled and analyzed the existing comprehensive traffic management plan within the EPZ provided by the OROs. It should be noted, nearly all of the traffic signals in the study area are actuated signals which will adapt their timing to the changing traffic patterns during evacuation. Based on the ETE simulation, two additional traffic control points (TCPs) are recommended. Refer to Section 9.

Selected Results

A compilation of selected information is presented on the following pages in the form of figures and tables extracted from the body of the report; these are described below.

- Table 3-3 presents the estimates of permanent resident population in each Area based on the 2020 Census data extrapolated to 2024.
- Table 6-1 defines each of the 13 Evacuation Regions in terms of their respective groups of Areas.
- Table 6-2 defines the 12 Evacuation Scenarios.

- Tables 7-1 and 7-2 are compilations of ETE for the general population. This data are the times needed to clear the indicated regions of 90% and 100% of the population occupying these regions, respectively. These computed ETE include consideration of mobilization time and of estimated voluntary evacuations from other regions within the EPZ and from the Shadow Region. These tables also include ETE results for staged evacuation on residents beyond the 2-Mile Radius; The ETE for Regions R02, R04 and R05 are compared to Regions R11, R12 and R13, respectively.
- Tables 7-3 and 7-4 present the ETE for the 2-Mile Radius when evacuating those beyond 2-miles downwind to 5 miles for un-staged and staged evacuations for the 90th and 100th percentile ETE, respectively.
- Table 8-2 presents the ETE for the children at schools in good weather.
- Table 8-4 presents the ETE for the transit-dependent population in good weather.
- Table 8-6 presents the ETE for the medical facilities in good weather.
- Table L-3 compares the results of the sensitivity study conducted to determine the effect on ETE due to changes in the permanent resident population within the study area (EPZ plus Shadow Region).
- Figure 6-1 presents a map of the St. Lucie EPZ showing the layout of the 8 Areas that comprise, in aggregate, the EPZ.
- Figure G-8 presents an example of an Evacuation Region (Region R08) to be evacuated under the circumstances defined in Table 6-1. Maps of all regions are provided in Appendix G.

Conclusions

- General population ETE were computed for 156 unique cases – a combination of 13 unique Evacuation Regions and 12 unique Evacuation Scenarios. Table 7-1 and Table 7-2 document these ETE for the 90th and 100th percentiles. The 90th percentile ETEs range from 4:15 (hr:min) to 8:15. The 100th percentile ETEs range from 7:00 to 10:45 for good weather and rain cases and are dictated by congestion within the study area for all scenarios..
- The comparison of Table 7-1 and Table 7-2 indicate that the 100th percentile ETE are significantly longer than those for the 90th percentile ETE. This is the result of the congestion within the EPZ. When the roadway system becomes congested, traffic exits the EPZ at rates somewhat below capacity until some evacuation routes have cleared. As more routes clear, the aggregate rate of egress slows since many vehicles have already left the EPZ. Towards the end of the process, relatively few evacuation routes service the remaining demand. See Section 7.5 and Figures 7-10 through 7-21.
- I-95, Florida Turnpike, US-1 and roads accessing the ramps to the interstate (I-95 and Florida turnpike) are the most congested areas during an evacuation. The last locations in the EPZ to exhibit traffic congestion are along US-1, the east-west roads that allow access to US-1 (Orange Avenue, CR-712/W Midway Road, St. Lucie W Boulevard, and SW Crosstown Parkway), and Selvitz Road, which allows access to the aforementioned east-west roads. All congestion within the EPZ clears by 9 hours and 40 minutes after the ATE

for an evacuation of the entire EPZ under Scenario 6 conditions (winter, midweek, midday with good weather). See Section 7.3 and Figures 7-3 through 7-9.

- The comparison of Scenarios 8 and 11 (winter, weekend, midday, good weather), in Table 7-1, indicates that the special event – Stuart Airshow - has an impact on the 90th percentile ETE (up to 35-minute increases in ETE for the 5-Mile Region and Regions 7 and 8). The increase is attendees reduce the roadway capacity, creating more congestion and delays prolonging ETE. The Stuart Airshow has no impact on the 100th percentile ETE, as shown in Table 7-2, as the significant congestion within the EPZ is dictating the ETE. See Section 7.5 for additional discussion.
- The comparison of Scenarios 1 and 12 in Table 7-1 and Table 7-2 indicates that the roadway closure – one lane southbound on I-95 from the interchange with SW St. Lucie West Blvd (Exit 121) to the interchange with SR-714/Martin Highway (Exit 110) – increases the 90th percentile ETE by at most 40 minutes and the 100th percentile ETE by at most 55 minutes – a significant change. See Section 7.5 for additional information.
- Inspection of Table 7-3 and Table 7-4 indicates that a staged evacuation provides no benefits to evacuees from within the 2-Mile Radius (compare the 2-mile radius with the remainder of the regions shown in the table in Tables 7-3 and 7-4). As per NUREG-0654, Supplement 3, this analysis would result in staged evacuation not being implemented. See Section 7.6 for additional discussion.
- Separate ETE were computed for schools, medical facilities, transit-dependent persons and disabilities and other access and functional needs persons. The average single-wave ETE for all these facilities is lower than the 90th percentile general population ETE. The average second wave ETE for schools, medical facilities, and the disabilities and other access and functional needs population do not exceed the 90th percentile ETE for general population whereas the ETE for transit dependent population exceeds the 90th percentile ETE for the general population and could affect protective action decision making. See Section 8.
- Table 8-1 indicates that there are insufficient transportation resources (ambulances) available to evacuate the bedridden population within the EPZ in a single wave. The bus capacity available is not sufficient to evacuate all of the schoolchildren, transit-dependent people and ambulatory persons in a single wave. Second wave ETE are computed for all those needing a bus or ambulance . See Sections 8.1 and 8.2.
- A decrease or increase of the base trip generation time by an hour has little to no impact on the 90th percentile ETE and 100th percentile ETE (by at most 10 minutes). As discussed in Section 7.3, traffic congestion persists within the EPZ for 9 hours and 40 minutes after the ATE. As such, the ETE is not significantly affected by trip generation but the congestion within the EPZ. See Appendix L.1 and Table L-1.
- The general population ETE is sensitive to an increase of the voluntary evacuation of vehicles in the Shadow Region. For example, quadrupling the shadow evacuation percentage increases the 90th percentile ETE by 1 hour and 25 minutes and 100th percentile ETE by 3 hours and 5 minutes. See Appendix L.2 and Table L-2.

- An increase in the permanent resident population (EPZ plus Shadow Region) of 8% or greater results in an increase in the longest 90th percentile ETE by 30 minutes for an evacuation of the Full EPZ (Region R03), which meets the federal criterion for performing a fully updated ETE study between decennial Censuses. See Appendix L.3 and Table L.3

Table 3-1. EPZ Permanent Resident Population

Area	2020 Population	2024 Extrapolated Population
1	4,446	4,662
2	14,257	16,260
3	41,438	44,151
4	45,562	56,221
5	82,819	104,577
6	25,351	31,640
7	23,680	25,020
8	7,591	8,585
EPZ TOTAL:	245,144	291,116
EPZ Population Growth (2020-2024):		18.75%

Table 6-1. Description of Evacuation Regions

Radial Regions									
		Area							
Region	Description	1	2	3	4	5	6	7[4]	8
R01	2-Mile Region	X							X
R02	5-Mile Region	X	X				X	X	X
R03	Full EPZ	X	X	X	X	X	X	X	X
Evacuate 2-Mile Region and Downwind to 5 Miles									
		Area							
Region	Wind Direction Towards:	1	2	3	4	5	6	7	8
N/A	N, NNE, NE, ENE, E, ESE, SE	Refer to Region R01							
R04	SSE, S, SSW	X					X	X	X
N/A	SW, WSW, W	Refer to Region R02							
R05	WNW, NW, NNW	X	X						X
Evacuate 2-Mile Region and Downwind to the EPZ Boundary									
		Area							
Region	Wind Direction Towards:	1	2	3	4	5	6	7	8
R06	N	X		X					X
N/A	NNE, NE, ENE, E, ESE	Refer to Region R01							
R07	SE	X						X	X
N/A	SSE	Refer to Region R04							
R08	S, SSW	X				X	X	X	X
R09	SW, WSW	X	X		X	X	X	X	X
N/A	W	Refer to Region R03							
R10	WNW, NW, NNW	X	X	X	X				X
Staged Evacuation - 2-Mile Radius Evacuates, then Evacuate Downwind to 5 Miles									
		Area							
Region	Wind Direction Towards:	1	2	3	4	5	6	7	8
R11	5-Mile Region	X	X				X	X	X
N/A	N, NNE, NE, ENE, E, ESE, SE	Refer to Region R01							
R12	SSE, S, SSW	X					X	X	X
N/A	SW, WSW, W	Refer to Region R11							
R13	WNW, NW, NNW	X	X						X

Area(s) Evacuate | Area(s) Shelter-in-Place | Area(s) Shelter-in-Place until 90% ETE for the 2-mile radius, then Evacuate

[4] According to site specific protective action recommendations, Area 7 will always evacuate when Areas 6 and 8 evacuate.

Table 6-2. Evacuation Scenario Definitions

Scenarios	Season[5]	Day of Week	Time of Day	Weather	Special
1	Summer	Midweek	Midday	Good	None
2	Summer	Midweek	Midday	Rain	None
3	Summer	Weekend	Midday	Good	None
4	Summer	Weekend	Midday	Rain	None
5	Summer	Midweek, Weekend	Evening	Good	None
6	Winter	Midweek	Midday	Good	None
7	Winter	Midweek	Midday	Rain	None
8	Winter	Weekend	Midday	Good	None
9	Winter	Weekend	Midday	Rain	None
10	Winter	Midweek, Weekend	Evening	Good	None
11	Winter	Weekend	Midday	Good	Special Event - Stuart Airshow
12	Summer	Midweek	Midday	Good	Roadway Impact - Single Lane Closure on I-95 Southbound

[5] Winter means that school is in session at normal enrollment levels (also applies to spring and autumn). Summer means that school is in session at summer school enrollment levels (lower than normal enrollment).

Table 7-1. Time to Clear the Indicated Area of *90* Percent of the Affected Population

	Summer		Summer		Summer	Winter		Winter		Winter	Winter	Summer
	Midweek		Weekend		Midweek Weekend	Midweek		Weekend		Midweek Weekend	Weekend	Midweek
Scenario:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Region	Midday		Midday		Evening	Midday		Midday		Evening	Midday	Midday
	Good Weather	Rain	Good Weather	Rain	Good Weather	Good Weather	Rain	Good Weather	Rain	Good Weather	Special Event	Roadway Impact
Entire 2-Mile Region, 5-Mile Region, and EPZ												
R01	4:25	4:45	5:15	5:40	4:15	5:00	5:25	5:15	5:40	4:20	5:15	4:25
R02	5:25	5:55	5:15	5:40	4:45	5:35	6:10	5:15	5:40	4:45	5:50	5:25
R03	7:20	8:10	6:55	7:40	5:55	7:30	8:15	6:55	7:40	6:00	7:00	7:50
2-Mile Region and Keyhole to 5 Miles												
R04	5:40	5:40	5:35	5:40	4:50	5:40	5:50	5:35	5:40	5:00	5:35	5:40
R05	5:00	5:10	5:05	5:30	4:20	5:05	5:20	5:05	5:30	4:20	5:05	5:00
2-Mile Region and Keyhole to EPZ Boundary												
R06	5:30	5:50	5:15	5:30	4:35	5:30	5:45	5:15	5:30	4:40	5:15	5:30
R07	5:35	5:35	5:25	6:05	4:25	5:40	5:40	5:25	6:05	4:30	5:40	5:35
R08	6:05	6:25	6:00	6:25	5:20	6:05	7:15	6:00	6:25	5:15	6:10	6:15
R09	6:45	7:30	6:30	7:10	5:45	6:45	7:30	6:30	7:10	5:50	6:30	7:25
R10	6:00	6:25	5:35	6:05	4:45	6:05	6:40	5:35	6:05	4:40	5:35	6:15
Staged Evacuation - 2-Mile Region and Keyhole to 5 Miles												
R11	5:45	5:55	5:25	5:45	5:10	5:40	6:15	5:20	6:00	5:05	5:50	5:45
R12	5:25	5:50	5:35	6:00	5:25	5:45	5:50	5:40	5:55	5:15	5:40	5:25
R13	4:50	4:50	4:40	5:00	4:25	5:05	5:20	5:05	5:10	4:25	5:05	4:50

Table 7-2. Time to Clear the Indicated Area of *100* Percent of the Affected Population

	Summer		Summer		Summer	Winter		Winter		Winter	Winter	Summer
	Midweek		Weekend		Midweek Weekend	Midweek		Weekend		Midweek Weekend	Weekend	Midweek
Scenario:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Region	Midday		Midday		Evening	Midday		Midday		Evening	Midday	Midday
	Good Weather	Rain	Good Weather	Rain	Good Weather	Good Weather	Rain	Good Weather	Rain	Good Weather	Special Event	Roadway Impact
Entire 2-Mile Region, 5-Mile Region, and EPZ												
R01	7:35	8:15	8:50	9:50	7:00	8:20	9:10	8:50	9:50	7:25	8:50	7:35
R02	7:45	8:20	9:15	9:50	7:20	8:30	9:10	9:10	9:50	7:40	9:10	7:45
R03	9:45	10:45	9:35	10:25	7:35	9:45	10:30	9:30	10:25	8:00	9:30	9:45
2-Mile Region and Keyhole to 5 Miles												
R04	7:40	8:15	9:10	9:50	7:20	8:30	9:10	9:10	9:50	7:40	9:10	7:40
R05	7:35	8:20	9:00	9:50	7:10	8:20	9:10	9:00	9:50	7:25	9:00	7:35
2-Mile Region and Keyhole to EPZ Boundary												
R06	8:05	8:40	9:15	10:20	7:20	8:50	9:30	9:00	10:20	7:50	9:00	8:05
R07	7:40	8:15	9:05	9:50	7:20	8:30	9:10	9:05	9:50	7:40	9:05	7:40
R08	7:45	8:25	9:10	9:55	7:20	8:30	9:30	9:10	9:55	7:40	9:10	7:55
R09	8:40	9:35	9:15	9:55	7:35	8:35	9:35	9:15	9:55	7:40	9:15	9:35
R10	8:30	9:10	9:20	10:20	7:30	8:55	9:45	9:20	10:20	7:50	9:20	8:40
Staged Evacuation - 2-Mile Region and Keyhole to 5 Miles												
R11	7:45	8:20	9:15	9:55	7:20	8:30	9:15	9:10	9:55	7:40	9:10	7:45
R12	7:45	8:20	9:10	9:55	7:20	8:30	9:10	9:10	9:55	7:40	9:10	7:45
R13	7:40	8:20	9:00	9:55	7:10	8:20	9:15	9:00	9:55	7:25	9:00	7:40

Table 7-3. Time to Clear 90 Percent of the 2-Mile Radius within the Indicated Region

	Summer		Summer		Summer	Winter		Winter		Winter	Winter	Summer
	Midweek		Weekend		Midweek Weekend	Midweek		Weekend		Midweek Weekend	Weekend	Midweek
Scenario:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Region	Midday		Midday		Evening	Midday		Midday		Evening	Midday	Midday
	Good Weather	Rain	Good Weather	Rain	Good Weather	Good Weather	Rain	Good Weather	Rain	Good Weather	Special Event	Roadway Impact
Unstaged Evacuation - 2-Mile Region and Keyhole to 5-Miles												
2-Mile Radius	2:15	2:45	2:55	3:15	2:45	3:10	3:15	2:55	3:15	2:45	2:55	2:15
R01	2:15	2:45	2:55	3:15	2:45	3:10	3:15	2:55	3:15	2:45	2:55	2:15
R02	2:15	2:45	2:55	3:15	2:45	3:10	3:15	2:55	3:15	2:45	2:55	2:15
R04	2:15	2:45	2:55	3:15	2:45	3:10	3:15	2:55	3:15	2:45	2:55	2:15
R05	2:15	2:45	2:55	3:15	2:45	3:10	3:15	2:55	3:15	2:45	2:55	2:15
Staged Evacuation - 2-Mile Region and Keyhole to 5-Miles												
R11	2:15	2:45	2:55	3:15	2:45	3:10	3:15	2:55	3:15	2:45	2:55	2:15
R12	2:15	2:45	2:55	3:15	2:45	3:10	3:15	2:55	3:15	2:45	2:55	2:15
R13	2:15	2:45	2:55	3:15	2:45	3:10	3:15	2:55	3:15	2:45	2:55	2:15

Table 7-4. Time to Clear 100 Percent of the 2-Mile Radius within the Indicated Region

	Summer		Summer		Summer	Winter		Winter		Winter	Winter	Summer
	Midweek		Weekend		Midweek Weekend	Midweek		Weekend		Midweek Weekend	Weekend	Midweek
Scenario:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Region	Midday		Midday		Evening	Midday		Midday		Evening	Midday	Midday
	Good Weather	Rain	Good Weather	Rain	Good Weather	Good Weather	Rain	Good Weather	Rain	Good Weather	Special Event	Roadway Impact
Unstaged Evacuation – 2-Mile Radius, 2-Mile Region and Keyhole to 5-Miles												
2-Mile Radius	6:15	6:15	6:15	6:15	6:15	6:15	6:15	6:15	6:15	6:15	6:15	6:15
R01	6:15	6:15	6:15	6:15	6:15	6:15	6:15	6:15	6:15	6:15	6:15	6:15
R02	6:15	6:15	6:15	6:15	6:15	6:15	6:15	6:15	6:15	6:15	6:15	6:15
R04	6:15	6:15	6:15	6:15	6:15	6:15	6:15	6:15	6:15	6:15	6:15	6:15
R05	6:15	6:15	6:15	6:15	6:15	6:15	6:15	6:15	6:15	6:15	6:15	6:15
Staged Evacuation - 2-Mile Region and Keyhole to 5-Miles												
R11	6:15	6:15	6:15	6:15	6:15	6:15	6:15	6:15	6:15	6:15	6:15	6:15
R12	6:15	6:15	6:15	6:15	6:15	6:15	6:15	6:15	6:15	6:15	6:15	6:15
R13	6:15	6:15	6:15	6:15	6:15	6:15	6:15	6:15	6:15	6:15	6:15	6:15

Table 8-2. School Evacuation Time Estimates – Good Weather

School In	Driver Mobilization Time (min)	Loading Time (min)	Dist. To EPZ Bdry (mi)	Average Speed (mph)	Travel Time to EPZ Bdry (min)	ETE (hr:min)	Dist. EPZ Bdry to S.R.C (mi.)	Travel Time from EPZ Bdry to S.R.C. (min)	ETE to S.R.C. (hr:min)
MARTIN COUNTY SCHOOLS									
Area 7	30	10	5.4	22.0	15	0:55	3.1	4	1:00
ST. LUCIE COUNTY SCHOOLS									
Area 2	30	10	6.4	17.6	22	1:05	4.8	6	1:15
Area 3	30	10	5.6	8.6	39	1:20	7.0	9	1:30
Area 4	30	10	4.2	27.4	9	0:50	10.1	13	1:05
Area 5	30	10	3.4	20.8	10	0:50	15.0	20	1:10
Area 6	30	10	8.4	14.9	34	1:15	14.9	20	1:35
					Maximum for EPZ:	1:20		Maximum:	1:35
					Average for EPZ:	1:05		Average:	1:15

Table 8-4. Transit-Dependent Evacuation Time Estimates – Good Weather

		Single Wave						Second Wave						
Route Servicing	Bus Number	Mobilization (min)	Route Length (miles)	Speed (mph)	Route Travel Time (min)	Pickup Time (min)	ETE (hr:min)	Distance to R. C. (miles)	Travel Time to R. C. (min)	Unload (min)	Driver Rest (min)	Route Travel Time (min)	Pickup Time (min)	ETE (hr:min)
Area 1	1-2	210	12.1	5.6	131	30	6:15	30.2	40	5	10	72	30	8:55
Area 2	1-5	210	6.4	2.6	150	30	6:30	32.2	43	5	10	60	30	9:00
Area 3	1-6	210	7.7	4.0	114	30	5:55	26.0	35	5	10	77	30	8:35
	7-13	230	7.7	4.5	103	30	6:05	26.0	35	5	10	77	30	8:45
Area 4	1-8	210	4.2	2.1	121	30	6:05	37.3	50	5	10	62	30	8:45
	9-16	230	4.2	2.3	112	30	6:15	37.3	50	5	10	77	30	9:10
Area 5	1-10	210	3.4	5.7	36	30	4:40	15.0	20	5	10	80	30	7:05
	11-18	230	3.4	6.5	32	30	4:55	15.0	20	5	10	70	30	7:10
	19-30	250	3.4	7.7	27	30	5:10	15.0	20	5	10	49	30	7:05
Area 6	1-4	210	8.4	3.8	133	30	6:15	58.6	78	5	10	101	30	10:00
	5-9	230	8.4	4.1	122	30	6:25	58.6	78	5	10	101	30	10:10
Area 7	1-7	210	5.4	6.2	52	30	4:55	47.2	63	5	10	78	30	8:05
Area 8	1-3	210	12.4	10.9	68	30	5:10	48.9	65	5	10	98	30	8:40
						Maximum ETE:	6:30						Maximum ETE:	10:10
						Average ETE:	5:45						Average ETE:	8:35

Table 8-6. Medical Facility Evacuation Time Estimates - Good Weather

Medical Facility In	Patient	Mobilization (min)	Loading Rate (min per person)	People	Total Loading Time (min)	Dist. To EPZ Bdry (mi)	Travel Time to EPZ Boundary (min)	ETE (hr:min)
MARTIN COUNTY								
Area 7	Ambulatory	90	1	287	18	5.4	72	3:00
	Wheelchair bound	90	5	128	15	5.4	71	3:00
	Bedridden	90	5	52	10	5.4	64	2:45
ST. LUCIE COUNTY								
Area 2	Ambulatory	90	1	34	30	6.4	123	4:05
	Wheelchair bound	90	5	14	15	6.4	118	3:45
	Bedridden	90	5	2	10	6.4	115	3:35
Area 3	Ambulatory	90	1	128	30	7.7	144	4:25
	Wheelchair bound	90	5	356	15	7.7	139	4:05
	Bedridden	90	5	323	10	7.7	138	4:00
Area 4	Ambulatory	90	1	192	30	4.2	143	4:25
	Wheelchair bound	90	5	117	15	4.2	138	4:05
	Bedridden	90	5	2	10	4.2	135	3:55
Area 5	Ambulatory	90	1	90	30	3.4	29	2:30
	Wheelchair bound	90	5	30	15	3.4	31	2:20
Area 6	Ambulatory	90	1	421	30	8.4	161	4:45
	Wheelchair bound	90	5	464	15	8.4	167	4:35
	Bedridden	90	5	172	10	8.4	167	4:30
							Maximum ETE:	4:45
							Average ETE:	3:45

Table L-3. ETE Variation with Population Increase

EPZ and 20% Shadow Permanent Resident Population	Base	Population Change		
	330,064	6%	7%	8%
		349,868	353,168	356,469
ETE (hrs:mins) for the 90th Percentile				
Region	**Base**	**Population Change**		
		6%	**7%**	**8%**
2-MILE (R01)	5:25	5:30	5:35	5:35
5-MILE (R02)	6:10	6:10	6:10	6:20
FULL EPZ (R03)	8:15	8:30	8:40	8:45
ETE for the 100th Percentile				
Region	**Base**	**Population Change**		
		6%	**7%**	**8%**
2-MILE (R01)	9:10	9:30	9:35	9:35
5-MILE (R02)	9:10	9:35	9:35	9:40
FULL EPZ (R03)	10:30	10:50	11:00	11:10

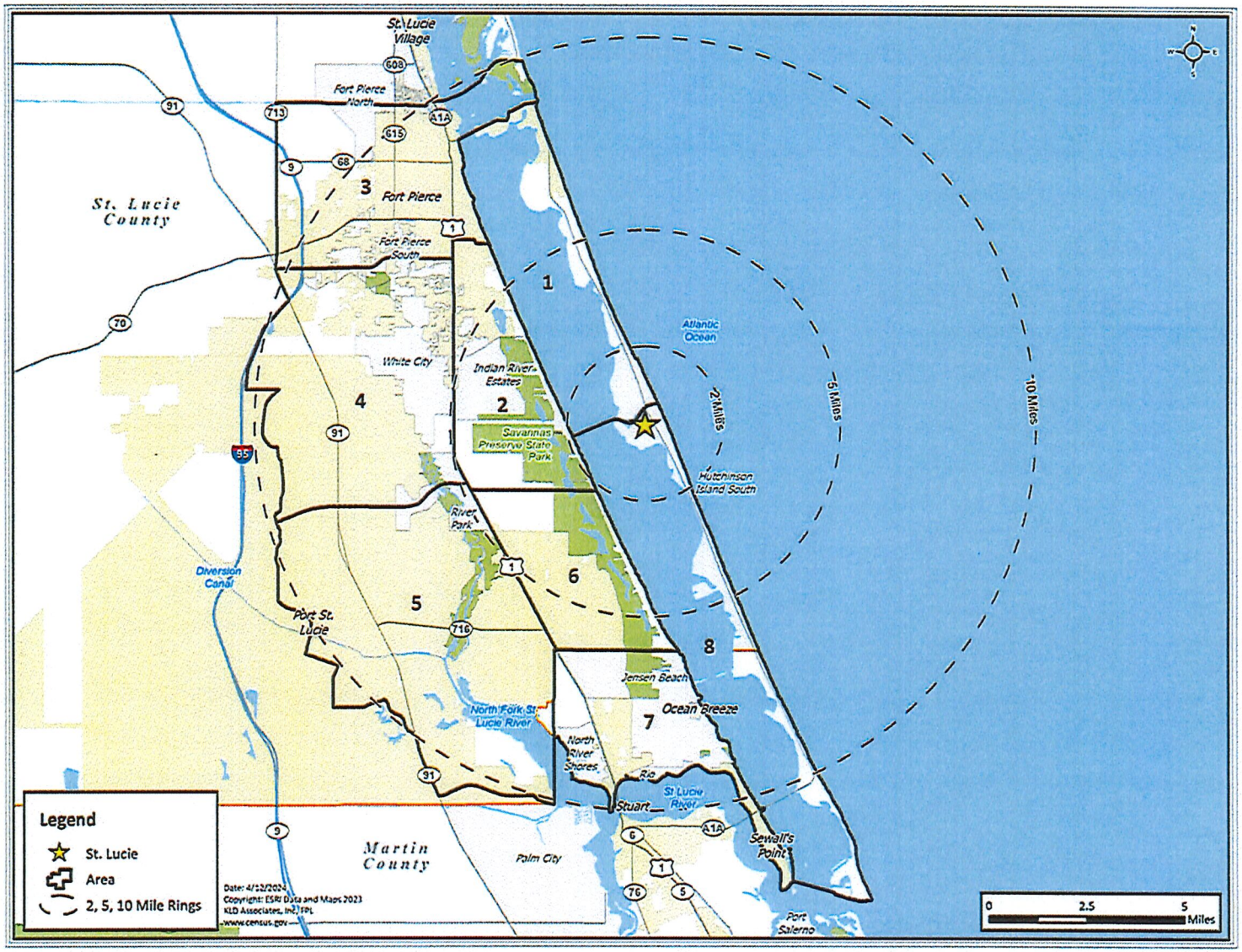

Figure 6-1. St. Lucie EPZ Areas

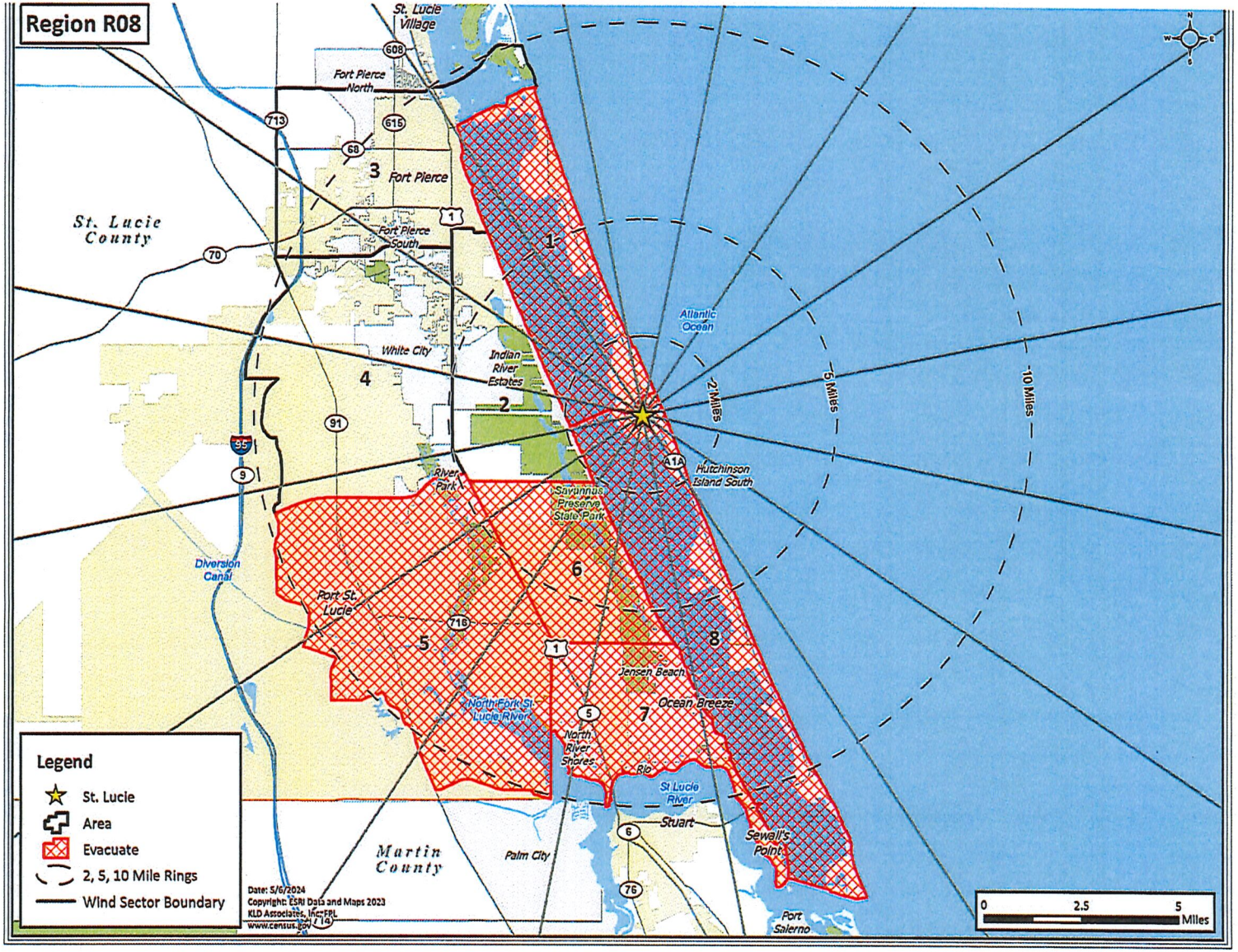

Figure G-8. Region R08