2.0 SITE CHARACTERISTICS

{This Chapter of the U.S. EPR FSAR is incorporated by reference with the following departures and/or supplements.

Chapter 2 describes the geological, seismological, hydrological, and meteorological characteristics of the {Calvert Cliffs Nuclear Power Plant (CCNPP)} site and vicinity. The site characteristics are described in conjunction with present and projected population distribution, land use, and site activities and controls. The {CCNPP} site characteristics were developed in accordance with the relevant requirements of Title 10 CFR Part 20, Subpart D (CFR, 2007a); Title 10 CFR Part 50 (CFR, 2007b); Title 10 CFR Part 100 (CFR, 2007c); and Regulatory Guide 1.206 (NRC, 2007).}

The U.S. EPR FSAR includes the following COL Item in Section 2.0:

> A COL applicant that references the U.S. EPR design certification will compare site-specific data to design parameter data in Table 2.1-1. If the specific data for the site falls within the assumed design parameter data and characteristics in Table 2.1-1, then the U.S. EPR standard design is bounding for the site. For site-specific design parameter data or characteristic that are outside the bounds of the assumptions presented in Table 2.1-1, the COL applicant will confirm that the U.S. EPR design acceptably meets any additional requirements that may be imposed by the more limiting site-specific design parameter data or characteristic, and that the design maintains conformance to the design commitments and acceptance criteria described in this FSAR.

This COL Item is addressed as follows:

{The {CCNPP Unit 3} site-specific parameters and characteristics have been reviewed and compared to determine if they are within the bounds of the assumed parameters and characteristics for a U.S. EPR. This comparison is provided in Tables 2.0-1 and 2.0-2. For the {CCNPP Unit 3} site-specific parameters or characteristics that are outside the bounds of the conservative limiting assumptions presented in Tables 2.0-1 and 2.0-2, justification of the acceptability of these conditions is provided in the associated section of Chapter 3, Design of Structures, Components, Equipment and Systems or as specified in the table.}

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Table 2.0-1—{U.S. EPR Site Design Envelope Comparison}

(Page 1 of 4)

	U.S. EPR FSAR Design Parameter Value/Characteristic	{CCNPP Unit 3} Design Parameter Value/Characteristic
Precipitation		
Rainfall	<19.4 in/hr	{18.5 in/hr (42 cm/hr)} (See Section 2.4.3)
Snow (design: extreme live load, including 48-hour probable maximum winter precipitation)	<100 psf	{53 psf (112 kg/m^2)} (See section 2.3.1)
Seismology		
Horizontal SSE Acceleration	0.3g Peak (CSDRS shapes – See Section 3.7.)	{Design Values are enveloped} (See Sections 2.5.2 and 3.7)
Vertical SSE Acceleration)	0.3g Peak (CSDRS shapes – See Section 3.7.)	{Design Values are enveloped} (See Sections 2.5.2 and 3.7)
Fault Displacement Potential	No fault displacement is considered for safety-related SSCs in U.S. EPR design certification.	{No fault displacement potential} (See Section 2.5.3)
Soil		
Minimum Bearing Capacity (Static)	22 ksf in localized areas at the bottom of the Nuclear Island basemat and 15 ksf on average across the total area of the bottom of the Nuclear Island basemat.	{24 ksf in localized areas of the NI Basemat and 15 ksf on the average across the total area of the bottom of the NI basemat} (See section 2.5.4)
Minimum Shear Wave Velocity (Low strain best estimate average value at bottom of basemat)	1000 fps	{1450 fps} (See Section 2.5.2.6)
Liquefaction	None	{None} (See section 2.5.4)
Slope Failure Potential	No slope failure potential is considered in the design of safety-related SSCs for U.S. EPR design certification.	{No slope failure potential that would adversely affect the safety of the proposed CCNPP Unit 3} (See Section 2.5.5)
Maximum Differential Settlement (across the basemat)	1/2 inch in 50 feet in any direction	{½-1 inch in 50 ft for common Basemat. (note a)} (See Sections 2.5.4 and 3.8.5.5.1) {> ½ inch in 50 ft for both EPGB and ESWB (note a)} (See Sections 2.5.4, 3.8.5.5.2, and 3.8.5.5.3)
Maximum Ground Water	3.3 ft below grade	{Ranges between 4.0 ft and 10 ft below grade} {3.0 ft below grade for EPGB 1/2 (note b)} (See Sections 2.4.12, 3.8.4, and 3.8.5.5.2) {One corner of ESWB} (See Sections 2.4.12 and 3.8.5.5.3)

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Table 2.0-1—{U.S. EPR Site Design Envelope Comparison}

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	U.S. EPR FSAR Design Parameter Value/Characteristic	{CCNPP Unit 3} Design Parameter Value/Characteristic
Inventory of Radionuclides Which Could Potentially Seep Into the Groundwater		
Bounding Values for Component Radionuclide Inventory	See Table 2.0-2	See Table 2.0-2
Flood Level		
Maximum Flood (or Tsunami)	1 ft below grade	{Approximately 3 ft below grade, except for the UHS Makeup Water Intake Structure and UHS Electrical Building which is designed to function under submerged conditions} (See Sections 2.4.1 and 2.4.2, 2.4.10, 3.4.2, 3.4.3.10, 3.8.4.1.11, 3.8.4.3, and 9.2.5)
Wind		
Maximum Sustained Speed	145 mph (Based on 3-sec gust at 33 ft above ground level and factored for 50-yr mean recurrence interval.)	{95 mph} (based on 3 second gust at 33 feet for 50 year recurrence interval) (See Section 2.3.1)
Importance Factor	1.15 (Safety-related structures for 100-year mean recurrence interval.)	{1.07} (safety related structures for 100 year mean recurrence interval) (See Section 2.3.1)
Tornado		
Maximum Pressure Drop	1.2 psi at 0.5 psi/sec	{0.9 psi at 0.4 psi/sec} (See Section 2.3.1)
Maximum Rotational Speed	184 mph	{160 mph} (See Section 2.3.1)
Maximum Translational Speed	46 mph	{40 mph} (See Section 2.3.1)
Maximum Wind Speed	230 mph	{200 mph} (See Section 2.3.1)
Radius of Maximum Rotational Speed	150 ft	{150 feet} (See Section 2.3.1)
Missile Spectra	6 in Schedule 40 pipe, 6.625 in diameter x 15 ft long, 287 lb, 34.5 in^2 impact area, impact velocity of 135 ft/sec horizontal and 90 ft/sec vertical.	{Design values are enveloped} (See Section 2.2 and 3.5)
	Automobile, 16.4 ft x 6.6 ft x 4.3 ft, 4000 lb, 4086.7 in^2 impact area, impact velocity of 135 ft/sec horizontal & 90 ft/sec vertical. (Automobile missile is considered at elevations up to 30.0 ft above grade elevation.)	{Design values are enveloped} (See Section 2.2 and 3.5)
	Solid steel sphere, 1 in diameter, 0.147 lb, 0.79 in^2 impact area, impact velocity of 26 ft/sec horizontal & 17 ft/sec Vertical.	{Design values are enveloped} (See Section 2.2 and 3.5)

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Table 2.0-1—{U.S. EPR Site Design Envelope Comparison}

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	U.S. EPR FSAR Design Parameter Value/Characteristic			{CCNPP Unit 3} Design Parameter Value/Characteristic
Temperature				
Air	0% Exceedance Values	Maximum	115°F Dry Bulb / 80°F Wet Bulb (coincident)	{115°F Dry Bulb /80°F Wet Bulb (coincident)} (See Section 9.2.1)
			81°F Wet Bulb (non-coincident) for UHS Design only	{81°F Wet Bulb (non-coincident) for UHS Design only} (See Section 9.2.1)
		Minimum	-40°F	{31.8°F} (See Section 2.3.1)
	1% Exceedance Values	Maximum	100°F Dry Bulb / 77°F Wet Bulb (coincident)	{0% exceedance values bound 1% exceedance values}
			80°F Wet Bulb (non-coincident) for UHS Design only	{0% exceedance values bound 1% exceedance values}
		Minimum	-10°F	{0% exceedance values bound 1% exceedance values}
UHS Meteorological Conditions				
Conditions resulting in Maximum Evaporation and Drift Loss of Water from the UHS (Section 2.3.1)			As presented in Table 2.1-3 – Design Values for Maximum Evaporation and Drift Loss of Water from the UHS	{Design Values are enveloped} (See Section 9.2.1.1)
Conditions resulting in Minimum Water Cooling in the UHS (Section 2.3.1)			As presented in Table 2.1-4 – Design Values for Minimum Water Cooling in the UHS.	{Design Values are enveloped.} (See Sections 9.2.1.1 and 2.3.1)
Potential for Water Freezing in the UHS Water Storage Facility (Sections 2.4.7 and 9.2.5)			As presented in Section 2.4.7 and 9.2.5	{No potential-See Sections 2.4.7 and 9.2.5}
UHS Design Parameters				
Maximum UHS Evaporative Water Loss	571 gpm			{571 gpm} (See Section 9.2.1.1)
Maximum Drift Water Loss	≤0.005%			{≤0.005%} (See Section 2.3.1.2)
Design Cold (outlet) Water Temperature	≤95°F (max ESWS supply design limit)			{<95 °F} (See Sections 2.3.1 and 9.2.1.1)

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Table 2.0-1—{U.S. EPR Site Design Envelope Comparison}

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	U.S. EPR FSAR Design Parameter Value/Characteristic	{CCNPP Unit 3} Design Parameter Value/Characteristic
Atmospheric Dispersion Factors (χ/Q)		
Maximum Annual Average (0.5 mile - limiting sector)	<4.973E-6 sec/m^3	{5.039E-06 sec/m^3 (note c)} (See Section 2.3.5)
Accident		
0-2 hr (Exclusion Area Boundary, (EAB), 0.5 miles)	<1E-3 sec/m^3	{6.914E-04 sec/m^3} (See Section 2.3.4)
0-2 hr (Low Population Zone (LPZ, 1.5 miles)	<1.75E-4 sec/m^3	{2.151E-04 sec/m^3 (note d)} (See Section 2.3.4)
2-8 hr hr (Low Population Zone (LPZ, 1.5 miles)	<1.35E-4 sec/m^3	{1.176E-04 sec/m^3} (See Section 2.3.4)
8-24 hr hr (Low Population Zone (LPZ, 1.5 miles)	<1.00E-4 sec/m^3	{6.865E-05 sec/m^3} (See Section 2.3.4)
1-4 day hr (Low Population Zone (LPZ, 1.5 miles)	<5.40E-5 sec/m^3	{3.005E-05 sec/m^3} (See Section 2.3.4)
4-30 day hr (Low Population Zone (LPZ, 1.5 miles)	<2.20E-5 sec/m^3	{9.179E-06 sec/m^3} (See Section 2.3.4)

Notes:

a. Value is a departure from a design parameter and is listed in Part 7 of the COL Application. Justification is provided in Chapter 3.

b. Value is a departure from a design parameter and is listed in Part 7 of the COL Application. Justification is provided Chapter 3

c. Value is a departure from a design parameter and is listed in Part 7 of the COL Application. Justification is provided in Section 2.3.5.

d. Value is a departure listed in Part 7 of the COL Application. Justification is provided in Chapter 15.

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Table 2.0-2—{Comparison of Inventory of Radionuclides Which Could Potentially Seep Into the Groundwater}

(Page 1 of 2)

	U.S. EPR FSAR Design Parameter Value/Characteristic	{CCNPP Unit 3} Design Parameter Value/Characteristic (See Section 2.4.13)
Nuclide	**Activity (Ci/g)**	**Activity (Ci/g)**
Br-83	3.2E-02	{3.2E-02}
Br-84	1.7E-02	{1.7E-02}
Br-85	2.0E-03	{2.0E-03}
I-129	4.6E-08	{4.6E-08}
I-130	5.0E-02	{5.0E-02}
I-131	7.4E-01	{7.4E-01}
I-132	3.7E-01	{3.7E-01}
I-133	1.3E+00	{1.3E+00}
I-134	2.4E-01	{2.4E-01}
I-135	7.9E-01	{7.9E-01}
Cs-134	1.7E-01	{4.4E-01}
Cs-136	5.3E-02	{1.1E-01}
Cs-137	1.1E-01	{1.7E-01}
Cs-138	2.2E-01	{2.3E-01}
Cr-51	2.0E-03	{2.1E-03}
Mn-54	1.0E-03	{1.1E-03}
Fe-55	7.6E-04	{8.1E-04}
Fe-59	1.9E-04	{2.0E-04}
Co-58	2.9E-03	{3.1E-03}
Co-60	3.4E-04	{3.6E-04}
Na-24	3.7E-02	{3.8E-02}
Zn-65	3.2E-04	{3.4E-04}
W-187	1.8E-03	{1.9E-03}
Rb-88	1.0E+00	{1.0E+00}
Rb-89	4.7E-02	{4.7E-02}
Sr-89	6.3E-04	{6.7E-04}
Sr-90	3.3E-05	{4.6E-05}
Sr-91	1.0E-03	{1.1E-03}
Sr-92	1.7E-04	{1.7E-04}
Y-90	7.7E-06	{1.1E-05}
Y-91m	5.2E-04	{5.4E-04}
Y-91	8.1E-05	{8.6E-05}
Y-92	1.4E-04	{1.4E-04}
Y-93	6.5E-05	{6.7E-05}
Zr-95	9.3E-05	{9.9E-05}
Nb-95	9.3E-05	{9.9E-05}
Mo-99	1.1E-01	{1.3E-01}
Tc-99m	4.6E-02	{5.7E-02}
Ru-103	7.7E-05	{1.1E-04}
Ru-106	2.7E-05	{6.2E-05}
Rh-103m	6.8E-05	{9.4E-05}
Rh-106	2.7E-05	{6.2E-05}
Ag-110m	2.0E-07	{1.0E-06}
Te-127m	4.4E-04	{6.6E-04}
Te-129m	1.5E-03	{1.9E-03}

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Table 2.0-2—{Comparison of Inventory of Radionuclides Which Could Potentially Seep Into the Groundwater}

(Page 2 of 2)

	U.S. EPR FSAR Design Parameter Value/Characteristic	{CCNPP Unit 3} Design Parameter Value/Characteristic (See Section 2.4.13)
Te-129	2.4E-03	{3.1E-03}
Te-131m	3.7E-03	{4.6E-03}
Te-131	2.6E-03	{3.0E-03}
Te-132	4.1E-02	{5.0E-02}
Te-134	6.7E-03	{6.7E-03}
Ba-137m	1.0E-01	{1.6E-01}
Ba-140	6.2E-04	{7.1E-04}
La-140	1.6E-04	{1.9E-04}
Ce-141	8.9E-05	{9.7E-05}
Ce-143	7.6E-05	{8.3E-05}
Ce-144	6.9E-05	{7.3E-05}
Pr-143	8.8E-05	{9.7E-05}
Pr-144	6.9E-05	{7.3E-05}
Np-239	8.7E-04	{1.5E-03}

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2.1 GEOGRAPHY AND DEMOGRAPHY

This section of the U.S. EPR FSAR is incorporated by reference with the following supplements.

The U.S. EPR FSAR includes the following COL Item in Section 2.1:

A COL applicant that references the U.S. EPR design certification will provide site-specific information related to site location and description, exclusion area authority and control, and population distribution.

This COL Item is addressed as follows:

{Site specific information related to site location and description is addressed in Section 2.1.1. Exclusion area authority and control is addressed in Section 2.1.2, and population distribution is addressed in Section 2.1.3.}

2.1.1 SITE LOCATION AND DESCRIPTION

~~The U.S. EPR FSAR includes the following COL Item in Section 2.1.1:~~

~~The site location and description is site specific and will be addressed by the COL applicant, including:~~

- ~~Specific location by longitude and latitude, Universal Transverse Mercator (UTM) coordinates, and political subdivisions; the site's relative location with respect to natural and man-made features of the area such as highways, railways, and waterways; and local population distribution.~~
- ~~A map of the site area of suitable scale (with explanatory text as necessary) showing relevant features such as the plant property lines, site and exclusion area boundaries (EAB), location and orientation of principal plant structures within the site area, and highways, railways and waterways that traverse or are adjacent to the site.~~

~~The COL Item is addressed as follows:~~

{Sections 2.1.1.1 through 2.1.1.3 are added as a supplement to the U. S. EPR FSAR.

2.1.1.1 Specification of Location

A site area map for the ~~{~~CCNPP~~}~~ site is provided in Figure 2.1-1. The coordinates of the center of the containment building for ~~{~~CCNPP Unit 3~~}~~ are provided in Table 2.1-1 for both the Geodetic Latitude/Longitude and the Universal Transverse Mercator (UTM) coordinate systems.

~~{~~CCNPP site and the surrounding area within 50 mi (80 km) and 10 mi (16 km), respectively. The CCNPP site occupies 2,057 acres (832 hectares) of which CCNPP Unit 3 will occupy approximately 420 acres (170 hectares) of the site. With the exception of CCNPP Units 1 and 2, no commercial, industrial, institutional, recreational, or residential structures are located within the CCNPP site. Camp Conoy, a former recreational summer camp used for various recreational purposes is now abandoned, with no plans for re-establishment.

The CCNPP site is located within Calvert County, Maryland. Calvert County is a peninsula bounded by the Chesapeake Bay on the east and the Patuxent River on the west. The CCNPP site is in the southeastern sector of Calvert County on the west bank of the Chesapeake Bay.

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The prominent natural features of the CCNPP site region include the Chesapeake Bay, the Patuxent River, and a generally wooded countryside. From the Chesapeake Bay, the wooded shoreline features 100 ft (30 m) cliffs with widely spaced small housing developments and marinas. The distance across the Chesapeake Bay in the vicinity of CCNPP site is approximately 6 mi (10 km). Located approximately 3 mi (5 km) offshore from the CCNPP site is a major shipping channel to the Port of Baltimore.

Calvert County includes two incorporated towns, North Beach and Chesapeake Beach, and seven town centers, Dunkirk, Owings, Huntingtown, Prince Frederick, St. Leonard, Lusby, and Solomons. St. Leonard, Lusby, and Solomons are located within 10 mi (16 km) of the CCNPP site. The county seat, Prince Frederick, Maryland, is approximately 10.5 mi (17 km) northwest of the site. Additional communities located near the CCNPP site include: Calvert Beach and Long Beach, approximately 3 mi (5 km) to the northwest; Cove Point, approximately 4.5 mi (7 km) to the southeast; and Chesapeake Ranch Estates, approximately 6 mi (10 km) to the south.

Calvert County has one main four-lane road, Maryland State Highway MD 2/4, bisecting the county north to south with smaller roads running from the main road to the water on each side. Very few of the smaller roads off MD 2/4 connect with each other; therefore, this highway services the bulk of the traffic for the length of the county. MD 2/4 runs adjacent to the CCNPP site and provides the main access to the site. Access to the site is via Calvert Cliffs Parkway and Road B from MD 2/4.

As described in section 2.2.2.6, there are no railroads within 5 miles (8 km) of the CCNPP site.

The Patuxent River Naval Air Station, a military installation, is location approximately 10 mi (16 km) to the south of the CCNPP site. The Dominion Cove Point Liquefied Natural Gas terminal, the only major industry other than CCNPP Units 1 and 2, is located about 3.6 mi (5.8 km) south of the CCNPP site. These facilities are depicted on Figure 2.1-3.

The metropolitan centers closest to the CCNPP site are Annapolis, MD, approximately 35 mi (56 km) to the north; Washington, D.C., approximately 45 mi (72 km) to the northwest; Baltimore, MD, approximately 60 mi (97 km) to the north; Richmond, VA, approximately 80 mi (129 km) to the southwest; and Norfolk, VA, approximately 110 mi (177 km) to the south.~~}~~

2.1.1.2 Site Area Map

A site area map for the ~~{~~CCNPP~~}~~ site is provided in Figure 2.1-1. This map shows the following attributes:

- Plant property (site boundary) lines. The area of the plant property is ~~{~~2,057 acres (832 hectares)~~}~~.
- Exclusion Area Boundary (EAB). Figure 2.1-4 provides an enlarged site area map that provides a scaled plot plan of the exclusion area in 22 ½ degree segments centered on the 16 cardinal compass points.
- Location and orientation of principal plant structures within the site area. Figure 2.1-5 shows an enlarged view of ~~{~~CCNPP Unit 3~~}~~.
- ~~{~~Location of CCNPP Units 1 and 2 which are the only other commercial structures within the site. There are no industrial, military, transportation facilities, institutional, recreational, or residential areas on the CCNPP site.~~}~~

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- True North and Plant North.
- Highways, railways, and waterways that traverse or are adjacent to the site.
- Prominent natural and man-made features in the site area.

2.1.1.3 Boundary for Establishing Effluent Release Limits

{The exclusion area is considered the restricted area.} The exclusion area boundary (EAB) for {CCNPP Unit 3} is a circle with a radius of {3,324 ft (1,013 m) or approximately 0.6 mi (1.0 km)} as depicted on Figure 2.1-1. The EAB establishes a radius of at least {0.5 mi (0.8 km)} from the potential release points. In accordance with 10 CFR 50.34(a)(1)(ii)(D)(1), an individual assumed to be located at any point on the EAB will not receive a radiation dose in excess of 25 rem TEDE over any two hour period following a postulated fission product release into the containment (CFR, 2007b). The EAB is established in accordance with 10 CFR 100.21(a) and 10 CFR 100.3 (CFR, 2007c).

This area will be conspicuously posted and administrative procedures, including security patrols will be imposed to control assess to the area. Section 2.1.2.1 provides additional discussion regarding the control of access to the EAB.

2.1.2 EXCLUSION AREA AUTHORITY AND CONTROL

~~The U.S. EPR FSAR includes the following COL Item in Section 2.1.2:~~

> ~~The authority for control of activities in the site exclusion area is site-specific and will be addressed by the COL applicant. This information will describe activities unrelated to plant operation that are permitted within the exclusion area.~~

~~The COL Item is addressed as follows:~~

{Sections 2.1.2.1 through 2.1.2.4 are added as a supplement to the U. S. EPR FSAR.

2.1.2.1 Authority

The CCNPP site was originally comprised of a number of parcels which were recombined and subdivided into a north parcel and a south parcel. The owner of the north parcel, which includes the CCNPP Units 1 and 2, is Calvert Cliffs Nuclear Power Plant, Inc. (a Constellation Generation Group, LLC company). The owners of the south parcel, which includes CCNPP Unit 3, are Constellation Generation Group, LLC, and UniStar Nuclear Operating Services, LLC. This division is shown on Figure 2.1-6. There are currently no plans to further consolidate ownership since Calvert Cliffs Nuclear Power Plant, Inc. is a Constellation Generation Group company. Constellation Generation Group, LLC, UniStar Nuclear Operating Services, LLC, and Calvert Cliffs Nuclear Power Plant, Inc., for their respective parceled areas within the CCNPP Unit 3 EAB, own the land, including mineral rights. These areas exclude the portion that extends into the Chesapeake Bay. Constellation Generation Group, LLC, UniStar Nuclear Operating Services, LLC, and Calvert Cliffs Nuclear Power Plant, Inc., for their respective parceled areas within the CCNPP Unit 3 EAB, possess the authority to determine all activities including the exclusion and removal of personnel and property. Constellation Generation Group, LLC, UniStar Nuclear Operating Services, LLC, and Calvert Cliffs Nuclear Power Plant, Inc., for their respective parceled areas within the CCNPP Unit 3 EAB, will exercise dominion and control in the event of an emergency to afford protection of public health and safety. Control of access to the CCNPP Unit 3 EAB within the CCNPP site boundary is provided by posting the boundary and performing security patrols.

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Access to the portion of the CCNPP Unit 3 EAB that extends into the Chesapeake Bay will be controlled through the use of buoys with postings that define the restrictions for the area. The United States Coast Guard (USCG) installs and maintains these buoys for the CCNPP site. The access restrictions for the portion of the CCNPP Unit 3 EAB that extends into the Chesapeake Bay are enforced by the USCG and the Maryland Department of Natural Resources police.

2.1.2.2 Control of Activities Unrelated to Plant Operations

No activities unrelated to plant operation are planned within the CCNPP Unit 3 EAB. No person or entity can reside, build, or conduct other activities without approval from Constellation Generation Group, LLC, UniStar Nuclear Operating Services, LLC, and Calvert Cliffs Nuclear Power Plant, Inc. for their respective parceled areas within the CCNPP Unit 3 EAB. However, in the event that an activity unrelated to plant operation is conducted within the CCNPP Unit 3 EAB, plant security will be notified prior to commencement of the activity to ensure that all individuals engaged in the activity may be evacuated in the event of an emergency.

2.1.2.3 Arrangements for Traffic Control

No state or county roads or railways traverse the CCNPP Unit 3 EAB. The waters of the Chesapeake Bay are the only public thoroughfare that traverses the EAB. The USCG and the Maryland Department of Natural Resources police enforce the access restrictions for the portion of the CCNPP Unit 3 EAB that extends into the Chesapeake Bay. The major shipping lane of the Chesapeake Bay lies outside of the CCNPP Unit 3 EAB.

2.1.2.4 Abandonment or Relocation of Roads

There are no public roads traversing the CCNPP Unit 3 EAB that will have to be abandoned or relocated because of their location.~~}~~

2.1.3 POPULATION DISTRIBUTION

~~The U.S. EPR FSAR includes the following COL Item in Section 2.1.3:~~

> ~~The distribution of the population in the site vicinity is site-specific and will be addressed by the COL applicant.~~

~~This COL Item is addressed as follows:~~

The population surrounding the site, up to a 50 mi (80 km) radius, was estimated based on the most recent U.S. Census Bureau decennial census data ~~{~~(USCB, 2000a)~~}~~. The population distribution was estimated in 10 concentric bands at 0 to 1 mi (0 to 1.6 km), 1 to 2 mi (1.6 to 3.2 km), 2 to 3 mi (3.2 to 4.8 km), 3 to 4 mi (4.8 to 6.4 km), 4 to 5 mi (6.4 to 8.0 km), 5 to 10 mi (8.0 to 16 km), 10 to 20 mi (16 to 32 km), 20 to 30 mi (32 to 48 km), 30 to 40 mi (48 to 64 km), and 40 to 50 mi (64 to 80 km) from the site, and 16 directional sectors, each direction consisting of 22 ½ degrees. The populations for years ~~{~~2010 through 2060~~}~~ by decade have been projected by calculating a growth rate using state population projections (by county) as the base.

In addition, the same population information was generated for the year of initial plant operation, and the end of plant life. This information is used for comparison against NRC population density criteria. ~~{~~It is projected that initial plant operation will occur in 2015. The license would expire 40 years after initial operation and, for the purposes of this evaluation, the year 2055 is the end of plant operations.~~}~~ These populations are included with the decade populations that follow and are addressed in detail in Section 2.1.3.6.

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Sections 2.1.3.1 through 2.1.3.6 are added as a supplement to the U. S. EPR FSAR.

2.1.3.1 Population Within 10 Mi (16 km)

Figure 2.1-7 shows places of significant population grouping, such as cities and towns, and other features within 10 mi (16 km) of the site. The map includes concentric circles drawn with the ~~{~~existing CCNPP Units 1 and 2~~}~~ at the center point, at distances of 1, 2, 3, 4, 5, and 10 mi (1.6, 3.2, 4.8, 6.4, 8.0, and 16 km). The map is divided into 22 ½ degree segments with each segment centered on one of the 16 compass points. ~~{~~According to the 2000 census, Chesapeake Ranch Estates, with a population of 11,503, is the largest community within 10 mi (16 km) of the site. Other towns within the 10 mi (16 km) radius include California (population of 9,307), Calvert Beach – Long Beach (population of 2,487), Lusby (population of 1,666), and Prince Frederick (population of 1,432) (USCB, 2000a). Calvert Beach – Long Beach, Lusby and portions of Chesapeake Ranch Estates~~}~~ lie within 5 mi (8 km) of the CCNPP site.

The resident population distribution within 10 mi (16 km) of the CCNPP site was computed by overlaying the 2000 census block points data (the smallest unit of census data) on the grid shown on Figure 2.1-8, and summing the population of the census block points within each sector. SECPOP 2000, a code developed for the NRC by Sandia National Laboratories, was utilized to calculate the resident population by emergency planning zone sectors (NRC, 2003). SECPOP uses 2000 block data from the USCB and overlays it into the sectors in the annuli prescribed by the user. The population projections for each county within 50 mi (80 km) of the CCNPP site were obtained from the Delaware Economic Development Office (DEDO, 2000), the Maryland Department of Planning (MDP, 2005), the USCB (USCB, 2005), and the Virginia Employment Commission (VEC 2006) and used to calculate an exponential growth rate for each county within the 50 mi (80 km) radius and Washington D.C. Each county growth rate was then used to project future populations (within each sector, taking into account the percent of each sector in a particular county).~~}~~

The population distributions (including transient population) and related information were tabulated for all distances and in all sixteen directions. Figure 2.1-8 through Figure 2.1-14 show the cumulative population (i.e., resident plus transient population) for the year ~~{~~2000~~}~~, and projected populations (by decade) through the year ~~{~~2060~~}~~. Tables on each map are keyed to the detailed populations within each radius interval-sector segment. The tables show ring population (one radius interval summed through all sectors) and cumulative population (population within each radius). See Section 2.1.3.6 and Figures 2.1-24 and 2.1-25 for similar maps for the year of initial operation and the year of plant shutdown. Each figure also shows totals by direction and by radius. ~~{~~For sectors with no land (and therefore no population), a population number is not shown.~~}~~ Since little information is available on future growth rates for transient populations, the anticipated growth rate for resident populations was also used for transient populations. The SECPOP 2000 results (with transient population added) were used to produce the 10 mi (16 km) radius population for the year ~~{~~2000 and the population projections described above were used in development of population estimates for 2010 through 2060 (by decade) the year of initial operation for CCNPP Unit 3 (2015), and the year of plant shutdown (2055).~~}~~ It is required that projected changes in population growth "within about 5 years" after initial site approval be evaluated. Initial site approval would occur in the ~~{~~2010 to 2011~~}~~ time frame. ~~{~~Plant construction is scheduled to begin in ~~{~~2011~~}~~. Therefore, the ~~{~~2010~~}~~ decade population and the ~~{~~2015~~}~~ population for initial operation are suitable for this evaluation.~~}~~ The detail provided in Figures 2.1-8 through 2.1-14 is summarized in Table 2.1-2.

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2.1.3.2 Population Between 10 and 50 Mi (16 and 80 km)

The 50 mi (80 km) radius centered at the ~~{~~CCNPP~~}~~ site includes ~~{~~all or parts of 2 counties in Delaware, 14 counties in Maryland, 16 counties in Virginia, and the District of Columbia~~}~~ as detailed in Figure 2.1-15. Figure 2.1-16 identifies places of significant population grouping, such as cities and towns, and include concentric circles drawn with the existing ~~{~~CCNPP Units 1 and 2 at the center point~~}~~ at 10 mi (16 km) increments (between 10 and 50 mi (16 and 80 km)). The map is divided into 22 ½ degree segments with each segment centered on one of the 16 compass points. Estimates of the year ~~{~~2000~~}~~ resident population between 10 and 50 mi (16 and 80 km) from the site were computed using the same methodology used to develop the 10 mi (16 km) population distribution.

The population grid from 10 to 50 mi (16 to 80 km) is shown on Figure 2.1-16. Transient population was not quantitatively determined for the 10 to 50 mi (16 to 80 km) radii as discussed in Section 2.1.3.3.2. The 50 mi (80 km) population distributions for the years ~~{~~2000 through 2060 (by decade) and the years of initial operation and plant shutdown for CCNPP Unit 3~~}~~ are shown on Figures 2.1-16 through 2.1-22. Totals populations for each year, including the years of initial operation and plant shutdown are summarized in Table 2.1-3.

2.1.3.3 Transient Population

2.1.3.3.1 Transient Population Within 10 Mi (16 km)

~~{~~Major land uses surrounding the CCNPP site include residential and agricultural. The waters in the vicinity of the CCNPP site are used for commercial fishing, especially for shellfish such as clams, oysters, and crabs, and offer a popular summer boating retreat.

Recreational use is considered the primary contributor to the transient population in the area. Several parks and museums lie within the 10 mi (16 km) radius. Nineteen marinas lie within 10 mi (16 km) radius.

Table 2.1-4, 2.1-5, and 2.1-6 list major employers, major recreational areas and attractions, and marinas, respectively, in the 10 mi (16 km) radius (CCNPP, 2002). The tables include the distance and direction from the CCNPP site. Seasonal and daily variations in transient population result from these land uses. Day/night employer populations vary substantially, from 1,812 during the day to 73 during the night. Recreational areas and attractions as well as marinas would likewise display a substantial drop at night. Winter populations would likely be lower at recreational areas and attractions, and at marinas.

Accounting for major employers (other than CCNPP Units 1, 2, and 3), overnight accommodations, major recreation areas, and marinas within the 10 mi (16 km) radius, a total transient population of 8,010 is estimated to be present within the 10 mi (16 km) radius. The 10 mi (16 km) transient population was added to the resident distribution and projected for future years as denoted in Figures 2.1-8 through 2.1-14, Figure 2.1-24, and Figure 2.1-25. The baseline (2000) transient population distribution for the 10 mi (16 km) radius is summarized in Table 2.1-7.~~}~~

2.1.3.3.2 Transient Population Between 10 and 50 Mi (16 and 80 km)

~~{~~A general discussion of transient population for the 10 to 50 mi (16 to 80 km) radius is provided below. A quantitative estimate of the transient population for the 10 to 50 mi (16 to 80 km) radius is not provided for the following reasons:

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1. There are no significant centers of transient populations between 10 and 30 mi (16 to 80 km) from the CCNPP site;

2. Annapolis (35 mi (56 km) from the CCNPP site) and Washington D.C. (45 mi (72 km) from the CCNPP site), despite being significant centers of transient populations (tourists, commuters, and other business travelers), are also resident population centers that dilute the proportion of transients. The CCNPP site is not located in an area where significant population increases due to transient land use, such as recreational or industrial, are expected; the areas nearest to the CCNPP site (including areas within Calvert County and St. Mary's County) experience a daytime net loss of more than 20,900 residents, primarily due to commuters traveling toward the Washington D.C. area and denoted in Table 2.1-8 (USCB, 2000b).

For the 30 to 50 mi (48 to 80 km) radius, significant transient population is expected given the economic influence and recreational opportunities of the Washington D.C. metropolitan area, located approximately 45 mi (72 km) from the CCNPP site. In 2004, Washington D.C. hosted 17.7 million domestic visitors. Of those 17.7 million domestic visitors, 67% were on leisure travel, 13% traveled for business, 16% were attending a convention or seminar, and 4% traveled for a combination of business and pleasure.

Four of Maryland's top ten 2004 destinations are in the 30 to 50 mi (48 to 80 km) radius. Annapolis (35 mi (56 km) from the CCNPP site) was Maryland's third top destination in 2004, with 1.1 million visitors. In close proximity to Washington D.C., Silver Spring and Bethesda, Maryland, both located approximately 50 mi (80 km) from the CCNPP site, were the sixth and tenth top destinations in 2004, respectively. Salisbury, Maryland in Wicomico County, located approximately 45 mi (72 km) from the CCNPP site, was the ninth top destination (MDOT, 2006). Eight-one percent of visitors to Maryland traveled for pleasure; 19% traveled for business.

In Virginia, Fairfax and Arlington counties (both in the Washington D.C. area) were the top two counties for travel expenditures in 2004 (leisure and business travelers). A portion of Prince William County is located 40 to 50 mi (64 to 80 km) radius, approximately 45 mi (72 km) from the CCNPP site. Prince William County ranked tenth in total travel expenditures (TIA, 2005).

A small portion of southern Delaware lies in the 50 mi (80 km) radius, and includes the town of Seaford located approximately 45 mi (72 km) from the CCNPP site, home to several museums, festivals, and outdoor recreational opportunities.

Seasonal agricultural workers make up a portion of the transient population in the 10 to 50 mi (16 to 80 km) radius. Farms in the following Maryland counties that fall wholly or partially in the 50 mi (80 km) radius employ migrant labor (number of farms in parentheses): Caroline (8), Charles (1), Dorchester (8), Kent County (8), Montgomery (32) (only a small portion lies in the 50 mi (80 km) radius), Prince Georges (7), Queen Annes (20), Somerset (3), Talbot (4), and Wicomico (12) (USDA, 2004a). Virginia counties within 50 mi (80 km) with farms employing migrant labor include: Accomack (10), Caroline (1), Essex (2), King and Queen (4), Lancaster (1), Middlesex (2), Northumberland (1), Prince William (1), Richmond (2), and Westmoreland (10) (USDA, 2004b). Kent and Sussex counties in Delaware contain 38 and 27 farms, respectively, that employ migrant labor (USDA, 2004c).~~}~~

2.1.3.4 Low Population Zone

The Low Population Zone (LPZ) for ~~{~~CCNPP Unit 3 is a 1.5 mile (2.4 km) radius area centered on CCNPP Unit 3. It is completely contained within the LPZ for CCNPP Units 1 and 2 which consist of the area falling within a 2 mi (3.2 km) radius of CCNPP Units 1 and 2. For conservatism, the

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CCNPP Unit 3 LPZ will be defined as the entire area of the CCNPP Units 1 and 2 LPZ. Figure 2.1-23 shows both the CCNPP Units 1 and 2 LPZ and the CCNPP Unit 3 LPZ. The communities of Lusby and Calvert Beach – Long Beach lie within the LPZ, as well as a portion of the Chesapeake Bay. Portions of Calvert Cliffs State Park and Bay Breeze Youth Campground, along with the majority of Flag Ponds Park also fall within the LPZ. No nursing homes, hospitals, prisons, or major employers (other than the existing CCNPP Units 1 and 2) are known to exist within the LPZ. One school, the Southern Middle School in Lusby, is located within the LPZ approximately 1.9 mi (3.0 km) south. This school had a combined student and faculty population of 771.}

The resident and transient population distributions within the existing LPZ for each decade from {2000 through 2060} is denoted as the 2 mi (3.2 km) cumulative population on Figures 2.1-8 through 2.1-14. The population within the LPZ including years {2015 and 2055, the expected year of initial operation and the expected year of license expiration for CCNPP Unit 3} are summarized in Table 2.1-9.

{There is considerable variation in peak daily and seasonal transient population within the LPZ. Winter daytime population with its one large school (771 students and staff) sees the highest population. This occupancy is minimal at night. Residents in the LPZ would have the highest population at night as many workers commute to points beyond the LPZ during the day. LPZ population would be lowest in the summer, when school is not in session.}

In accordance with 10 CFR 50.34(a)(1)(ii)(D)(2), an individual located on the outer radius of the LPZ for the course of the postulated accident (assumed to be 30 days) would not receive a radiation dose in excess of 25 rem TEDE (CFR, 2007b). {For CCNPP Units 1 and 2, this distance was 2 mi (3.2 km). It has been determined that the CCNPP Unit 3 could achieve the 25 rem TEDE within 1.5 miles. Onsite emergency preparedness personnel have developed an Emergency Planning Zone that extends well beyond the CCNPP site boundary and its Radioactive Emergency Plan establishes evacuation routes both onsite and offsite. Under these plans, emergency preparedness personnel would have ample time to take appropriate protective measures to all affected individuals within and beyond the existing LPZ.}

Facilities and institutions in and beyond the LPZ that may require special consideration when evaluating emergency plans are defined out to a distance of 10 mi (16 km). {This 10 mi (16 km) radius includes the LPZ and approximates the CCNPP Emergency Planning Zone. There are no prisons or hospitals in the 10 mi (16 km) radius. Schools and nursing homes in the Emergency Planning Zone are listed in Table 2.1-10 and Table 2.1-11, respectively. Recreational areas (parks and beaches) and marinas are listed in Table 2.1-5 and Table 2.1-6, respectively.}

2.1.3.5 Population Center

{St. Charles, Maryland is the closest population center that meets the definition contained in 10 CFR 100.3, (i.e., it has a population of greater than 25,000) (CFR, 2007c). St. Charles' population was 33,379 per the census data provided for the year 2000 (USCB, 2000a). The nearest political boundary of St. Charles, Maryland, corresponding with the nearest boundary of the population center, is approximately 26 mi (42 km) west-northwest of the CCNPP site as denoted in Figure 2.1-15. The distance between St. Charles and the site is approximately 13 times the radius of the existing LPZ. Therefore, it meets the requirement that the population center distance be at least one and one-third times the distance from the reactor to the outer boundary of the LPZ (10 CFR 100.11(a)(3)). Transient populations were not used to establish the nearest population center. The closest center of significant employment is the Patuxent River Naval Air Station, approximately 9 mi (14 km) south of the CCNPP site, which employed approximately 20,200 persons in 2005 (SMCDEC, 2006).

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As shown in Figure 2.1-15, St. Charles is in the west-northwest (WNW) sector beginning in the 20 to 30 mi (32 to 48 km) radius interval. This population grouping is approximately 20 mi (32 km) from Washington D.C., but is still surrounded by farmland. The population of the WNW sector 20 to 30 mi (32 to 48 km) radius interval in 2015 would be 78,206 with a land area of 98.1 mi^2 (254 km^2) equating to a population density of 796 persons/mi^2 (307 persons/km^2). Over the project life of CCNPP Unit 3, the population is expected to grow approximately 2.4% per year.}

2.1.3.6 Population Density

This section describes populations and resulting population densities in the years of initial operation and the end of operations. For the purposes of this study, it is assumed that initial operation of {CCNPP Unit 3 begins in 2015. It is also assumed that the end of operations is upon license expiration which is currently projected to be the year 2055}, 40 years thereafter.

Figure 2.1-24 and Figure 2.1-25 provide the same detailed population data for {2015 and 2055} in the 10 mi (16 km) vicinity that were provided by Figures 2.1-8 through 2.1-14 for the decades of {2000 through 2060}, respectively. Figures 2.1-26 and Figure 2.1-27 provide the 50 mi (80 km) region population data for {2015 and 2055}.

Figure 2.1-28 shows the cumulative population in year {2000} within 30 mi (48 km) of the {CCNPP site} and projected cumulative populations in years {2015} (assumed year of initial operations) and {2055} (assumed year for end of operations). On the same figure, spanning the same radial distances, population curves are calculated for hypothetical densities of 500 persons/mi^2 (200 persons/km^2) and 1,000 persons/mi^2 (400 persons/km^2) to demonstrate that the population density does not exceed 500 persons/mi^2 (200 persons/km^2) at the time of the projected COL approval and within 5 years thereafter consistent with guidance provided in Regulatory Guide 4.7, Position C.4 (NRC, 1998) and Regulatory Guide 1.206 (NRC, 2007). {Areas located exclusively over water were excluded in calculating population densities.}

{For all radial distances (1, 2, 3, 4, 5, 10, 20, and 30 mi (1.6, 3.2, 4.8, 6.4, 8.0, 16, 32, and 48 km)), the population for the startup date (2015) is below a population density of 500 persons/mi^2 (200 persons/km^2). The highest population density at startup was at the 5 mi (8 km) radius. Using a land area for the 5 mi (8 km) radius of 38.7 mi^2 (100.2 km^2), the population for the 5 mi (8 km) radius would be 484 persons/mi^2 (187 persons/km^2) at startup.

Figure 2.1-28 also presents the total population at the end of operations date (2055) compared with the total population for the hypothetical density of 1,000 persons per square mile. For all radial distances (1, 2, 3, 4, 5, 10, 20, and 30 mi (1.6, 3.2, 4.8, 6.4, 8.0, 16, 32, and 48 km)), the population is below the 1000 persons/mi^2 (400 persons/km^2) density criterion. The highest population in 2055 at the 10 mi (16 km) radius is 132,360 while the total population for the 1,000 persons/mi2 (400 persons/km2) population density is 139,175. The end of operations (2055) total population equates to a density of 951 persons/mi^2 (367 persons/km^2) using a land area of 139.2 square miles.

The densities at expected COL approval in the year 2010 would be less than the 500 per square mile but the maximum density would grow slightly, at approximately 1.5 percent per year, from 450 persons/mi^2 (174 persons/km^2) in 2010 to 484 persons/mi^2 (187 persons/km^2) in 2015.}

2.1.4 REFERENCES

{This section is added as a supplement to the U. S. EPR FSAR.

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Table 2.1-1—{CCNPP Unit 3 Specific Location}

Latitude/Longitude (NAD 27) (Degrees)	Latitude/Longitude (NAD 83) (Degrees)	UTM, Zone 18N (78W to 72W) (NAD 27) (Meters)	UTM, Zone 18N (78W to 72W) (NAD 83) (Meters)
N 38 25 40.85225	N 38 25 41.29323	North/South 4254079.23	North/South 4254298.77
W 76 26 19.26254	W 76 26 17.39253	East/West 374418.85	East/West 374467.58

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Table 2.1-2—{Population Within 10 mi (16 km) Radius (2000 – 2060)}

Year	10 mi (16 km) Radius Population
2000	48,755
2010	57,937
2015	63,441
2020	69,504
2030	83,129
2040	99,840
2050	120,508
2055	132,360
2060	145,458

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Table 2.1-3—{Population Within 50 mi (80 km) Radius (2000 – 2060)}

Year	50 mi (80 km) Radius Population
2000	3,210,270
2010	3,503,399
2015	3,676,123
2020	3,861,449
2030	4,293,030
2040	4,807,088
2050	5,424,927
2055	5,778,694
2060	6,162,511

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Table 2.1-4—{Transient Population Facilities - Population Facilities - Major Employers Within the 10 mi (16 km) Zone)}

Name of Facility	County	Compass Direction/ Distance – mi (km)	Daytime Population	Nighttime Population
Dominion Cove Point LNG	Calvert	SSE / 3-4 (4.8-6.4)	35	20
Solomons Strip Malls	Calvert	S / 6-7 (9.7-11.3)	367	-
Chesapeake Biological Laboratory	Calvert	S / 8-9 (12.9-14.5)	150	-
St. Mary's Industrial Park	St. Mary's	SW / 9-10 (14.5-16)		
PRB Associates			230	-
Mechanical Products Inc. (Minitec)			60	0
Merkle Mailing Services.			150	50
Wildewood Technology Park	St. Mary's	SSW / 10-11 (16-18)		
Tracor			500	0
Congressional Information Service			70	3
Wildewood Mall	St. Mary's	SSW / 10-11 (16-18)	250	-

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Table 2.1-5—{Transient Population Facilities - Major Recreational Areas and Attractions Within the 10 mi (16 km) Zone}

Name of Facility	County	Compass Direction / mi (km)	Population
Flag Ponds Nature Park	Calvert	NW / 1-2 (1.6-3.2)	263
Calvert Cliffs State Park Day Use Area & Park Beach	Calvert	S / 2-3 (3.2-4.8) SE / 2-3 (3.2-4.8)	217 108
Cove Point Recreation Park	Calvert	SSE / 3-4 (4.8-6.4)	500
Calvert County Marine Museum	Calvert	S / 7-8 (11.3-12.9)	378
Battle Creek Cypress Swamp Nature Area & Visitor Center	Calvert	WNW / 9-10 (14.5-16)	378
Jefferson Patterson Park & Museum	Calvert	WSW / 4-5 (6.4-8.0)	360

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Table 2.1-6—{Transient Population Facilities - Marinas Within the 10 mi (16 km) Zone}

Name of Facility	County	Compass Direction/ mi (km)	Number of Slips	Population
Mill Creek	Calvert	S / 6-7 (9.7-11.3)	100	90
Hospitality Harbor	Calvert	S / 6-7 (9.7-11.3)	75	68
Town Center Marina	Calvert	S / 7-8 (11.3-12.9)	104	93
Harbor Island	Calvert	S / 7-8 (11.3-12.9)	115	104
Spring Cove Marina	Calvert	S / 7-8 (11.3-12.9)	246	221
Comfort Inn / Beacon Marina	Calvert	S / 7-8 (11.3-12.9)	186	168
Zahnizer's	Calvert	S / 7-8 (11.3-12.9)	300	270
Bunky's	Calvert	S / 7-8 (11.3-12.9)	10	9
Solomons Yacht Club	Calvert	S / 7-8 (11.3-12.9)	32	30
Calvert Marina	Calvert	S / 7-8 (11.3-12.9)	450	405
White Sands	Calvert	WSW / 2-3 (3.2-4.8)	100	90
Broome's Island Marina	Calvert	WSW / 5-6 (8.0-9.7)	20	18
Bill's	Calvert	WSW / 6-7 (9.7-11.3)	15	15
Flag Harbor	Calvert	NW / 2-3 (3.2-4.8)	168	151
Blackstone	St. Mary's	SSW / 7-8 (11.3-12.9)	60	54
Reliable Marina	St. Mary's	SSW / 8-9 (12.9-14.5)	26	24
Weeks Marine Railway	St. Mary's	SW / 7-8 (11.3-12.9)	50	45
Cape St. Mary's	St. Mary's	W / 9-10 (14.5-16)	150	135
Boatel California	St. Mary's	SSW / 8-9 (12.9-14.5)	58	53

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Table 2.1-7—{Transient Population Distribution for the 10 mi (16 km) Radius (2000)}

Radius mi (km)	Direction	Number of Transients
1-2 (1.6-3.2)	NW	263
2-3 (3.2-4.8)	SE	283
2-3 (3.2-4.8)	S	217
2-3 (3.2-4.8)	WSW	90
2-3 (3.2-4.8)	NW	151
3-4 (4.8-6.4)	SSE	535
4-5 (6.4-8.0)	WSW	360
4-5 (6.4-8.0)	NW	32
5-10 (8.0-16)	ENE	408
5-10 (8.0-16)	S	3,163
5-10 (8.0-16)	SSW	1,477
5-10 (8.0-16)	SW	485
5-10 (8.0-16)	WSW	33
5-10 (8.0-16)	W	135
5-10 (8.0-16)	WNW	378
	TOTAL	**8,010**

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Table 2.1-8—{Commuting Patterns To and From the Calvert County and St. Mary's County Area (2000)}

Parameter	County	Charles County	Prince George's County	Anne Arundel County	District of Columbia	Other	Total
Worker Inflow to the Two County Area	Calvert	640	641	1,118	59	678	3,136
	St. Mary's	2,197	378	262	126	1,357	4,320
	Total	2,837	1,019	1,380	185	2,035	7,456
Worker Outflow from the Two County Area	Calvert	1,178	8,243	1,739	3,967	3,909	19,036
	St. Mary's	3,313	2,244	80	1,828	1,886	9,351
	Total	4,491	10,487	1,819	5,795	5,795	28,387
Net Worker Outflow from the Two County Area	Calvert	538	7,602	621	3,908	3,231	15,900
	St. Mary's	1,116	1,866	(182)	1,702	529	5,031
	Total	1,654	9,468	439	5,610	3,760	20,931

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Table 2.1-9—{Population Within the LPZ {(2000 – 2060)}

Year	LPZ Population
2000	2,508
2010	2,884
2015	3,102
2020	3,336
2030	3,827
2040	4,414
2050	5,092
2055	5,455
2060	5,844

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Table 2.1-10—{Special Facilities – Schools Within the 10 mi (16 km) Zone}

Name of Facility	County	Compass Direction / mi (km)	Student Enrollment	Staff	Total Population
Southern Middle School	Calvert	S / 1-2 (1.6-3.2)	694	77	771
Patuxent Elementary School	Calvert	S / 3-4 (4.8-6.4)	434	59	493
Appeal Elementary School	Calvert	S / 4-5 (6.4-8.0)	488	55	543
Mutual Elementary School	Calvert	WNW / 5-6 (8.0-9.7)	542	72	614
Our Lady Star of the Sea School	Calvert	S / 7-8 (11.3-12.9)	199	15	214
Community College	Calvert	NW / 6-7 (9.7-11.3)	350	20	370
St. Leonard Elementary	Calvert	WNW / 3-4 (4.8-6.4)	701	67	768
Mill Creek Middle School	Calvert	S / 5-6 (8.0-9.7)	636	67	703
Patuxent High School	Calvert	S / 5-6 (8.0-9.7)	1747	121	1868
Dowell Elementary School	Calvert	S / 5-6 (8.0-9.7)	727	71	798
Town Creek Elementary School	St. Mary's	SSW / 9-10 (14.5-16)	332	32	364
Esperanza Middle School	St. Mary's	SSW / 10-11 (16-18)	923	83	1006
St. Johns Elementary School	St. Mary's	SW / 9-10 (14.5-16)	235	21	256
Hollywood Elementary School	St. Mary's	SW / 9-10 (14.5-16)	632	57	689
Green Holly Elementary School	St. Mary's	SSW / 10-11 (16-18)	732	97	829

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Table 2.1-11—{Special Facilities - Nursing Homes Within the 10 mi (16 km) Zone}

Name of Facility	County	Compass Direction / mi (km)	Number of Residents Independent / Assisted	Staff Day / Night	Total Population Day / Night
Southern Pines	Calvert	S / 3-4 (4.8-6.4)	100 / NA	2 / 0	100 / 100
Asbury at Solomon's Island	Calvert	S / 6-7 (9.7-11.3)	300 / 66	80 / 25	446 / 391
Solomon's Nursing Center	Calvert	S / 6-7 (9.7-11.3)	NA / 127	60 / 12	187 / 139

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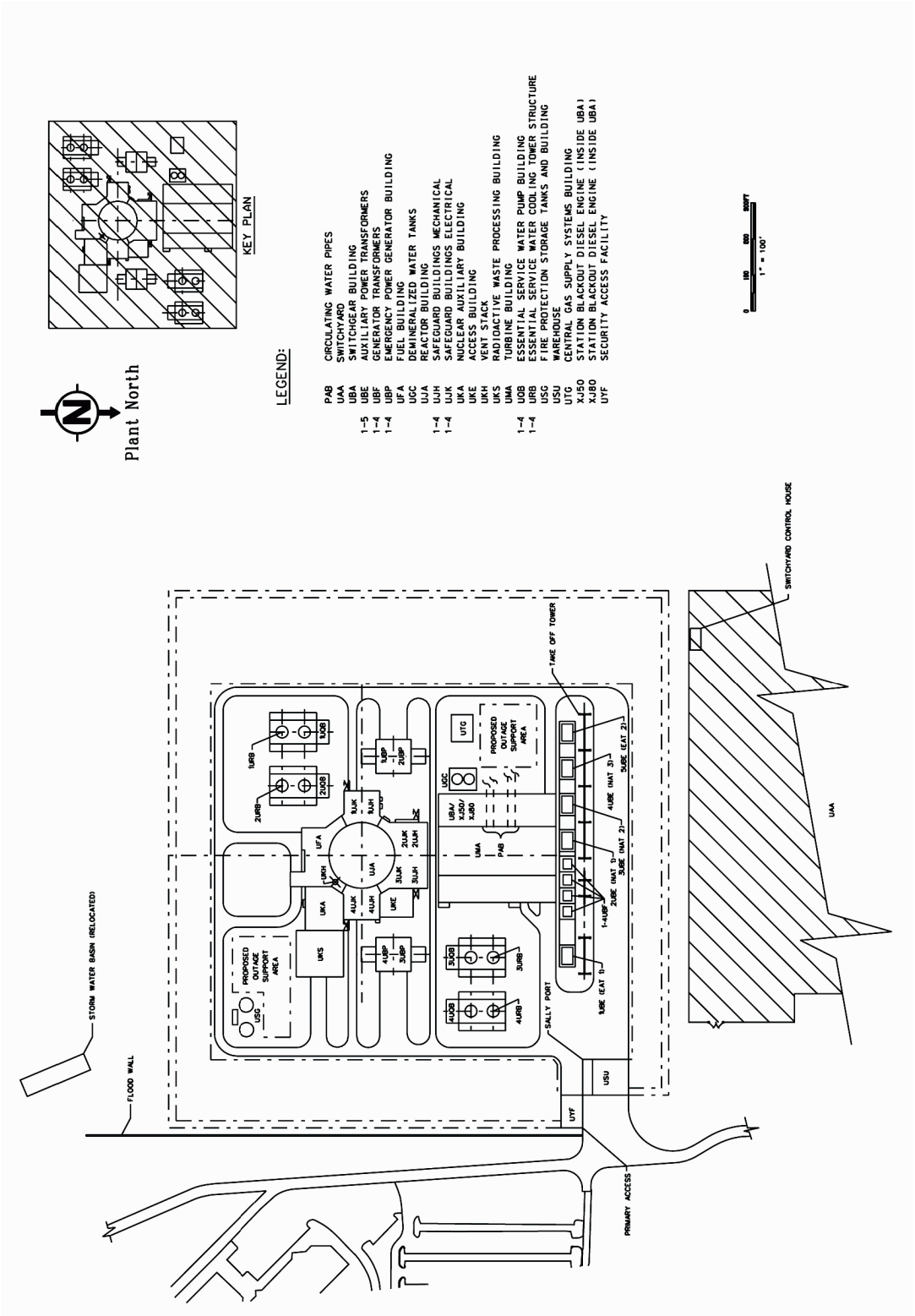

Figure 2.1-1—{Site Area Map}

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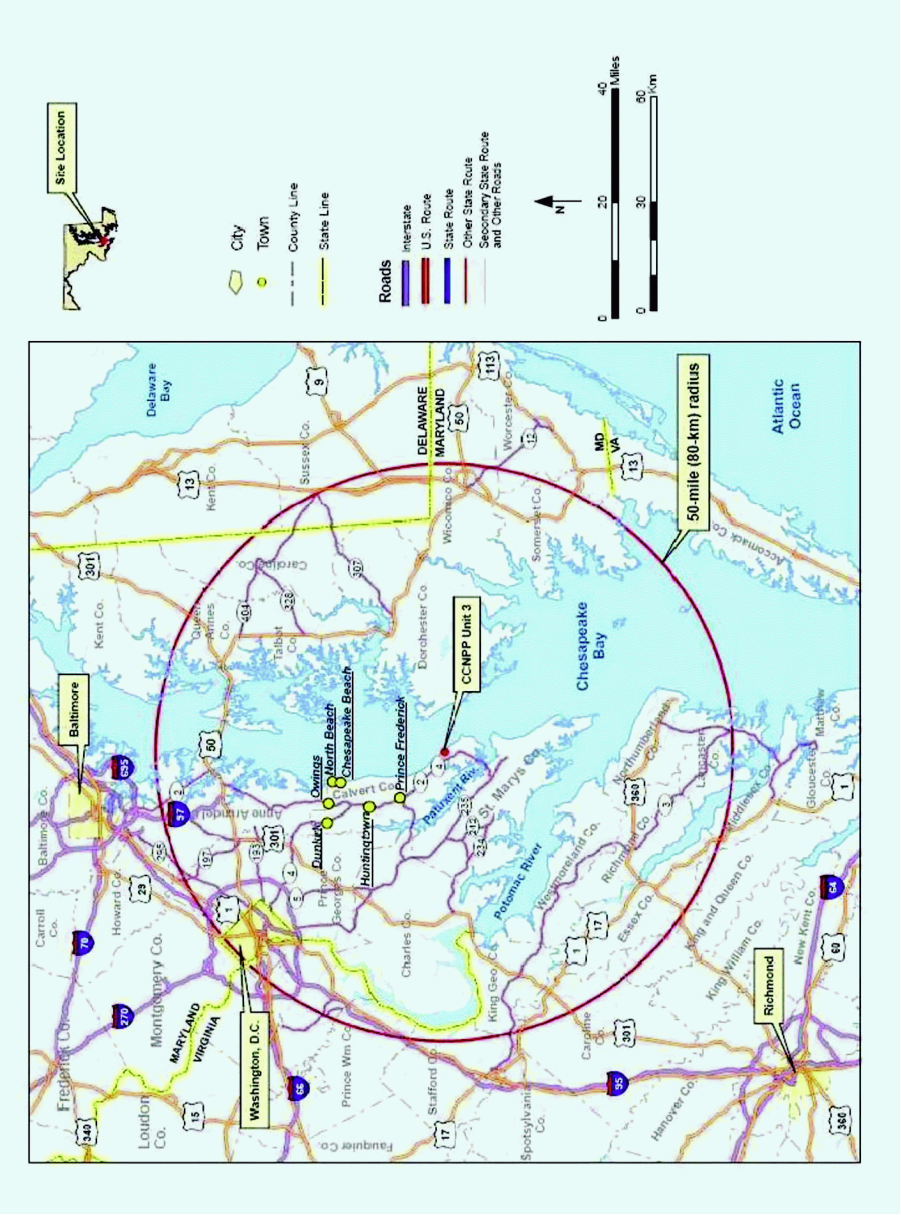

Figure 2.1-2—{50 mi (80 km) Surrounding Area}

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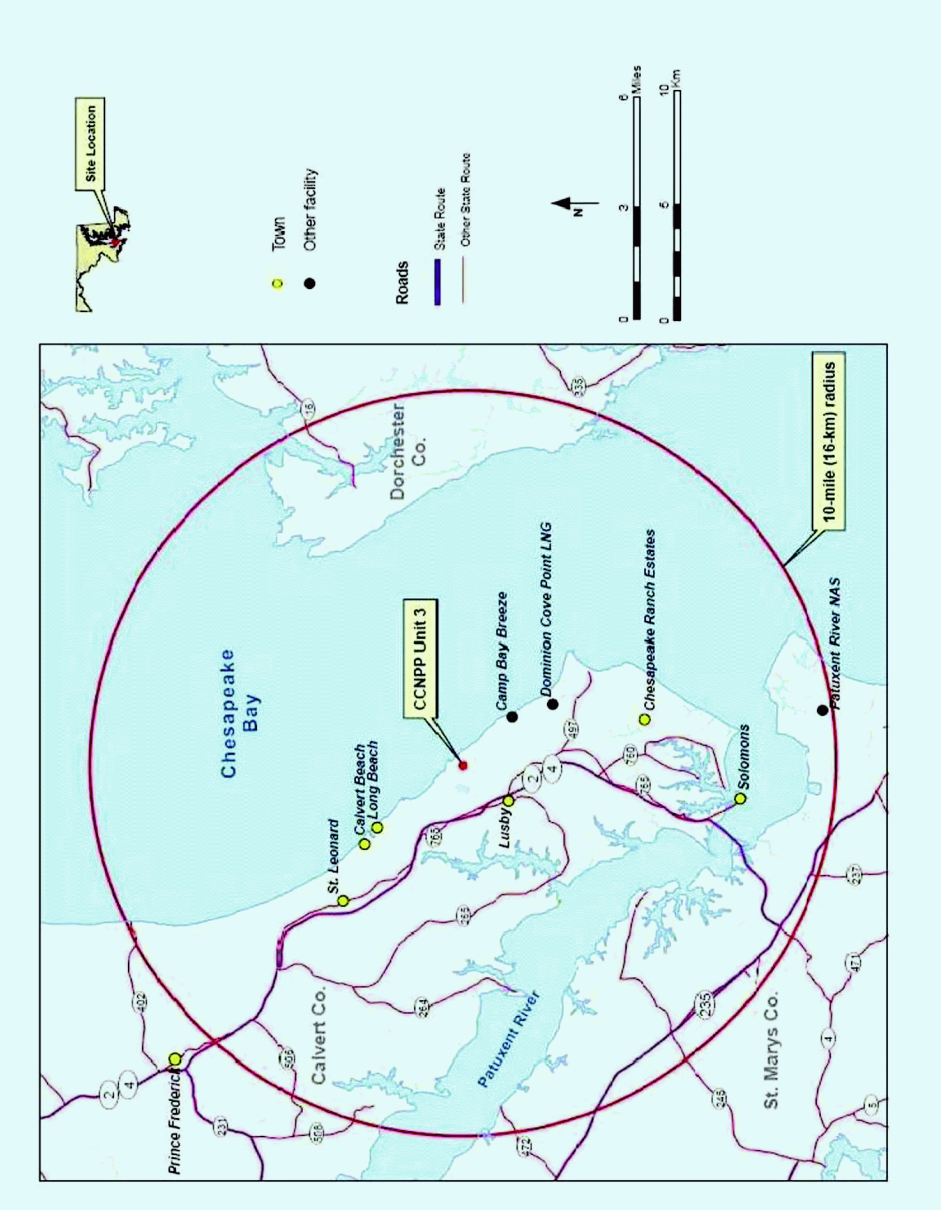

Figure 2.1-3—{10 mi (16 km) Surrounding Area}

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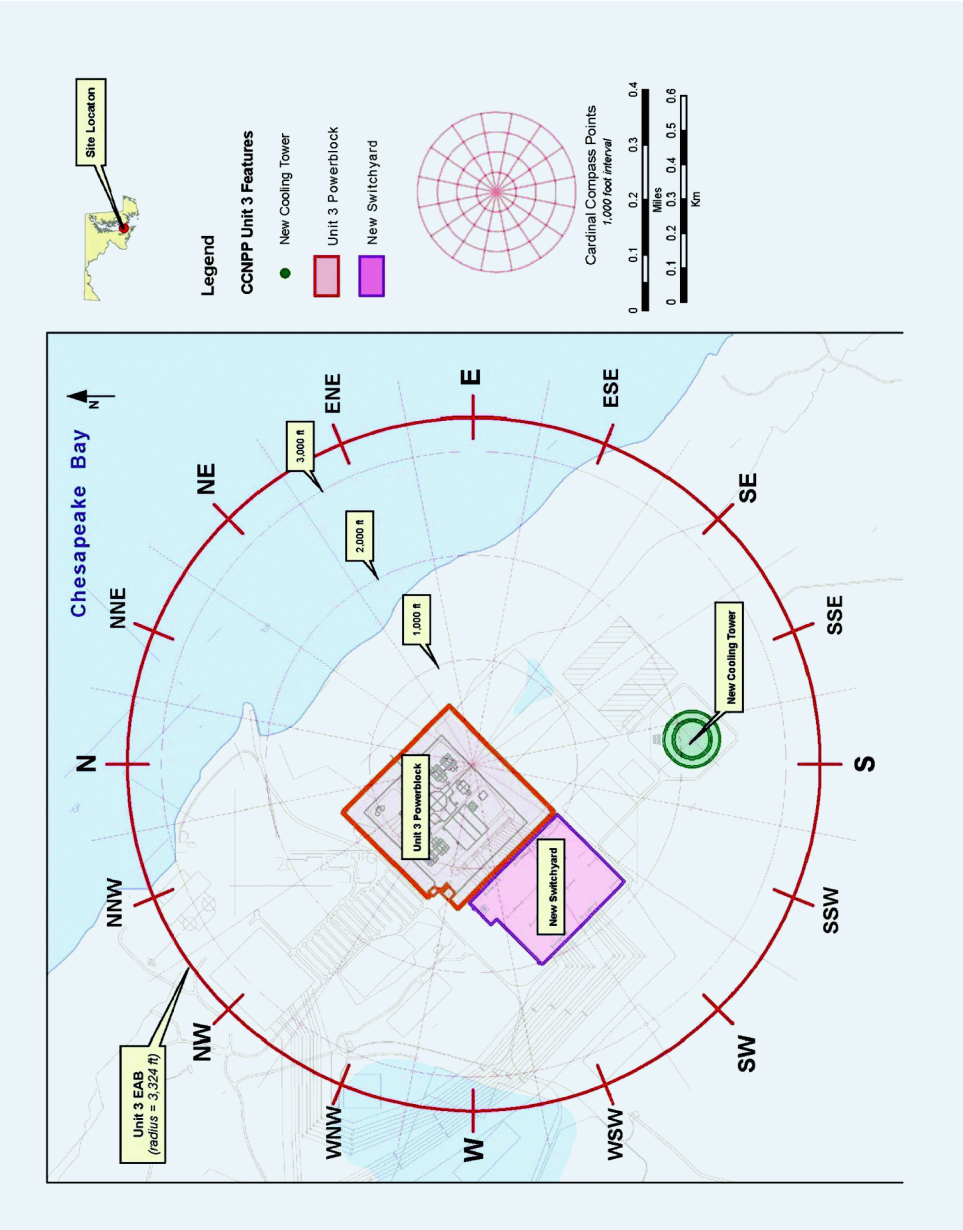

Figure 2.1-4—{Enlarged Site Map}

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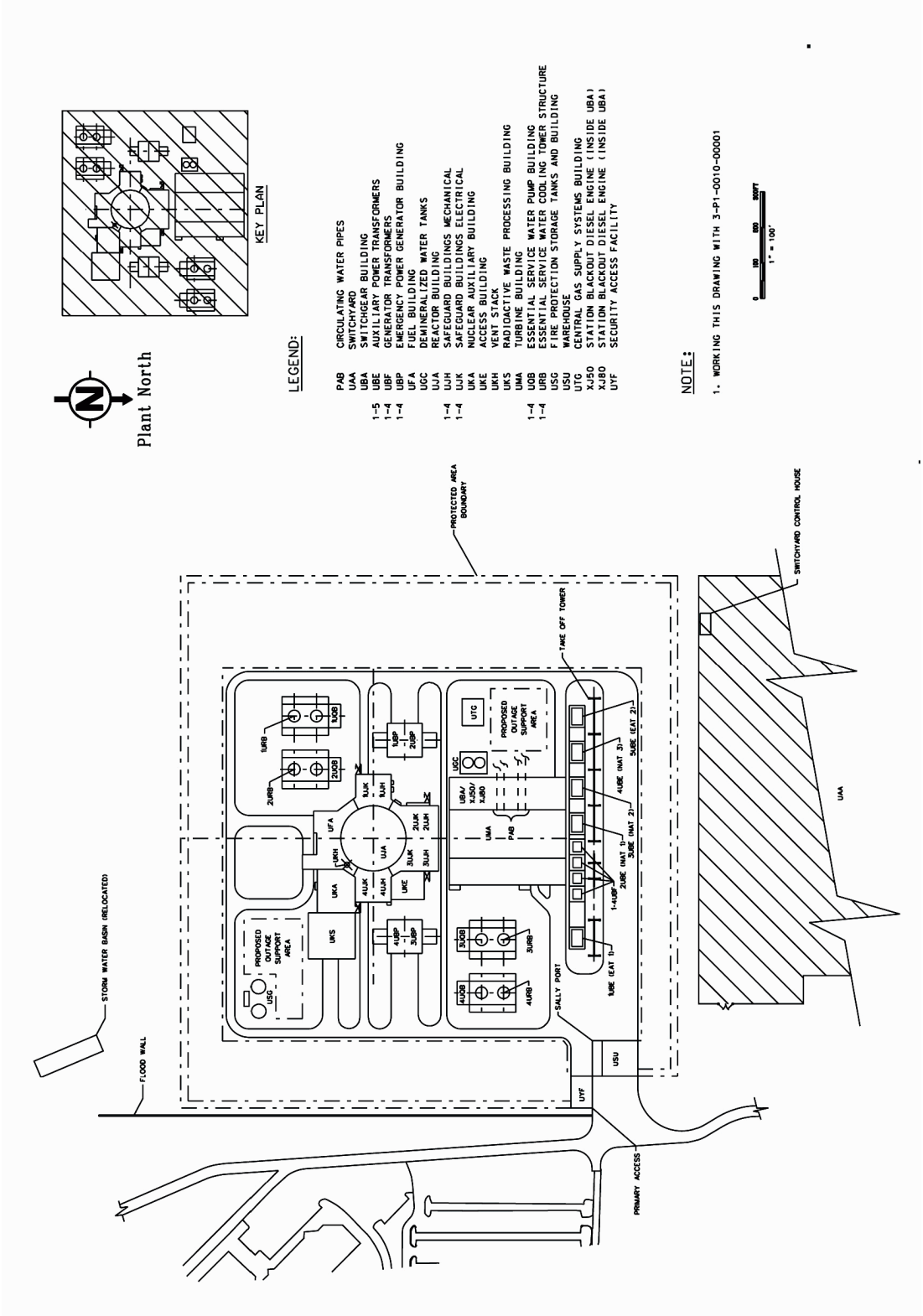

Figure 2.1-5—{{CCNPP Unit 3}} Enlargement}

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Figure 2.1-6—{Division of Site Parcels}

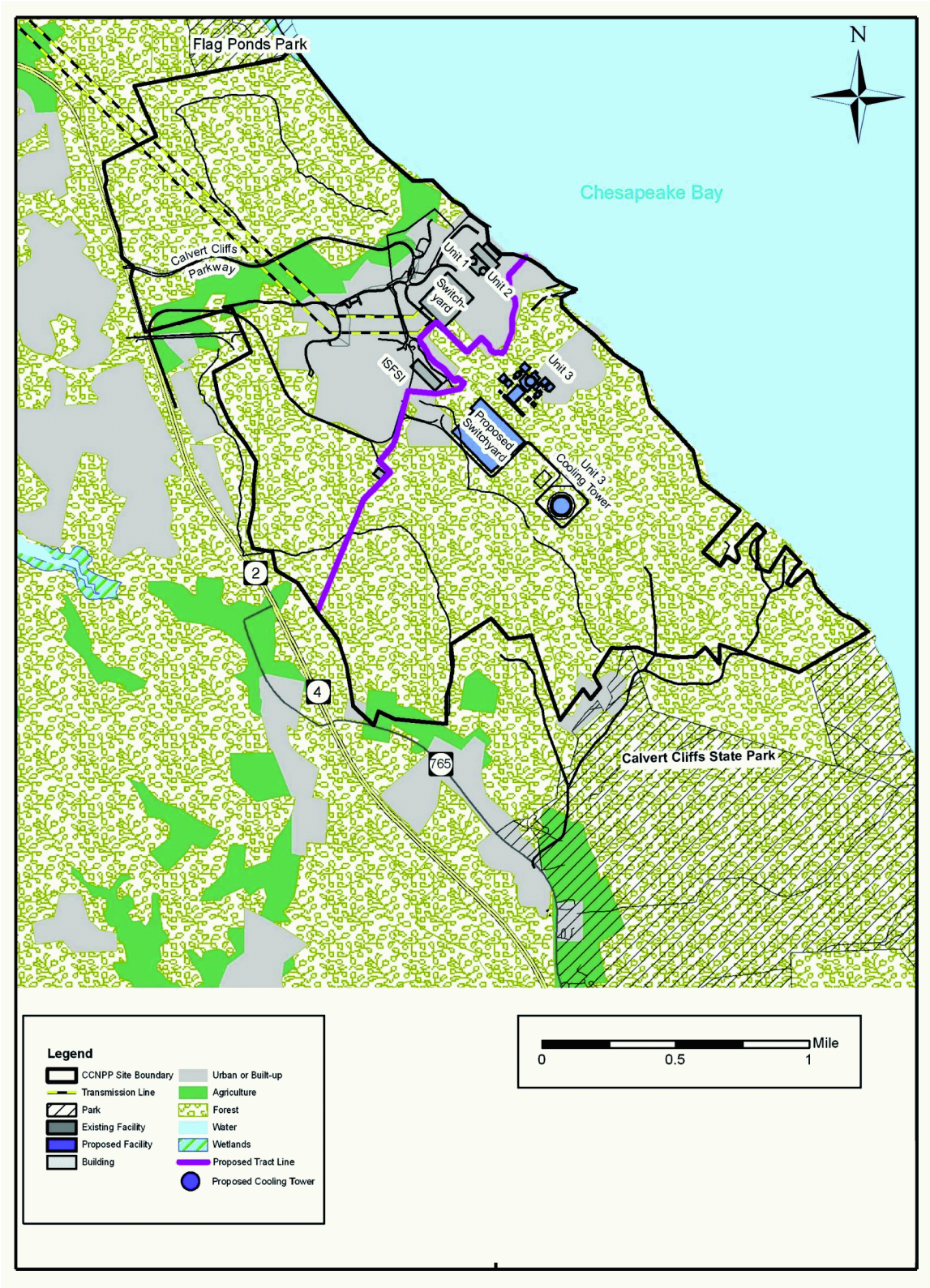

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Figure 2.1-7—{10 mi (16 km) Radius Map}

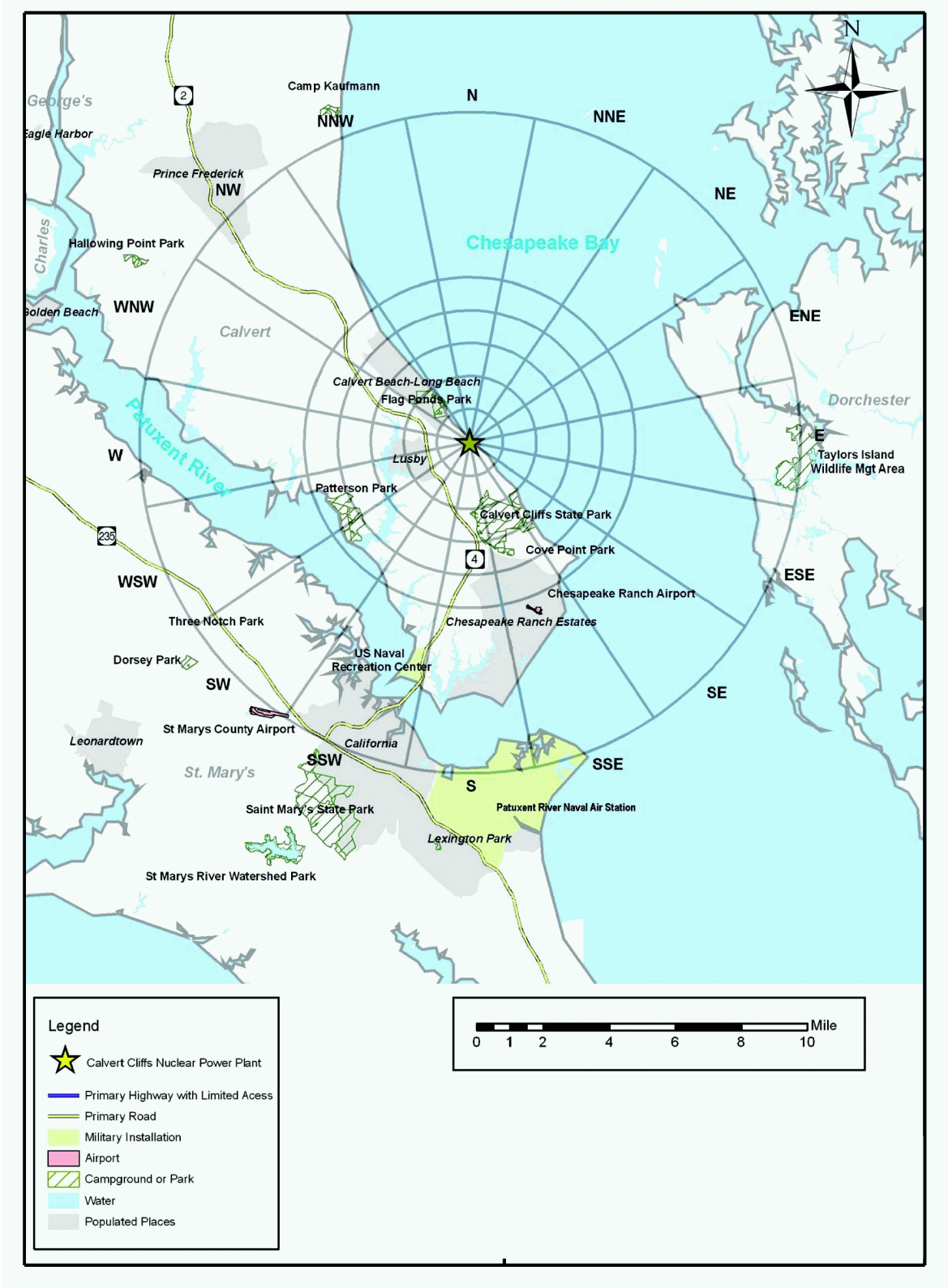

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Figure 2.1-8—{10 mi (16 km) ~~{~~2000~~}~~ Population Distribution}

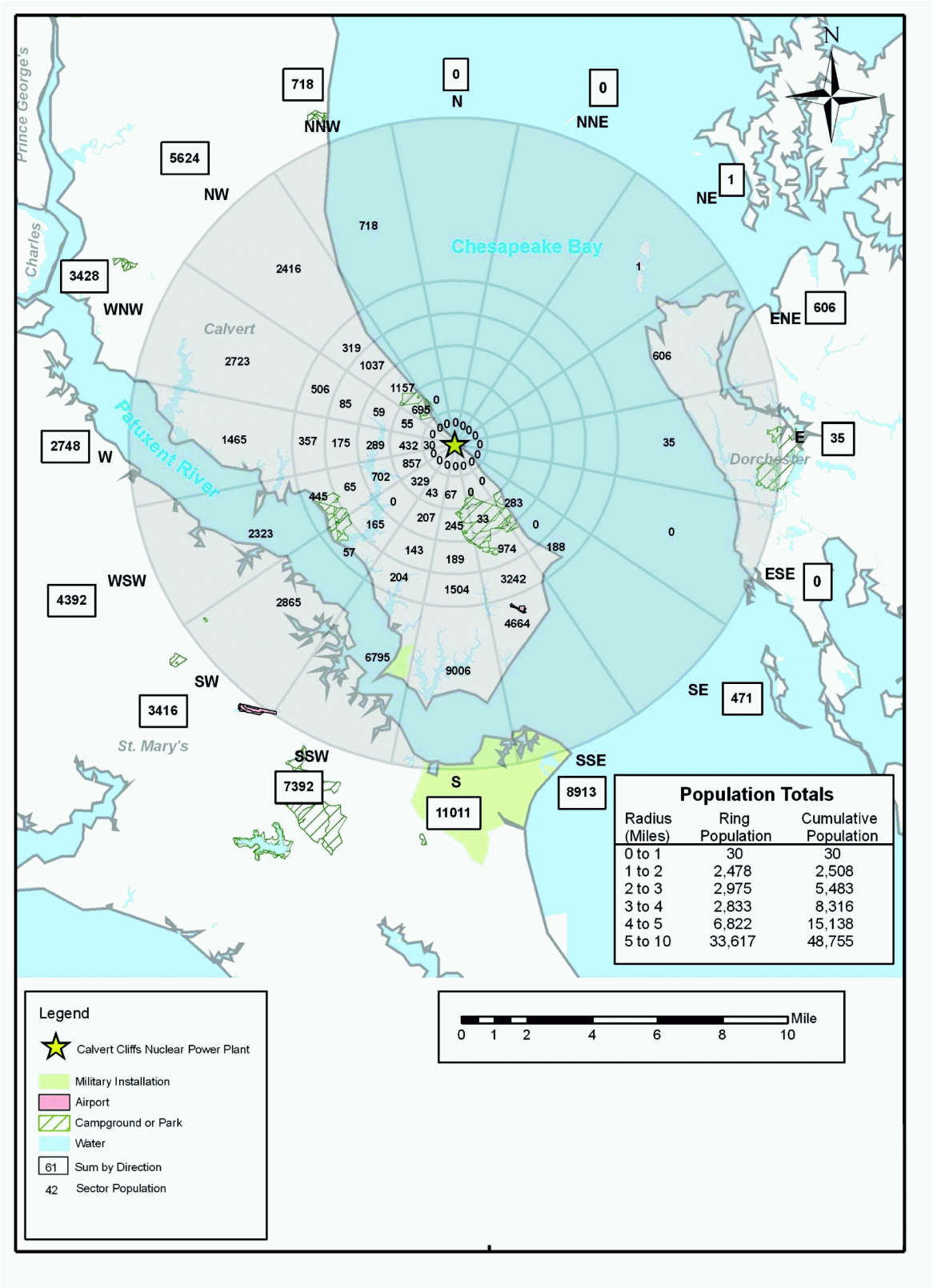

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Figure 2.1-9—{10 m (16 km) {2010} Population Distribution}

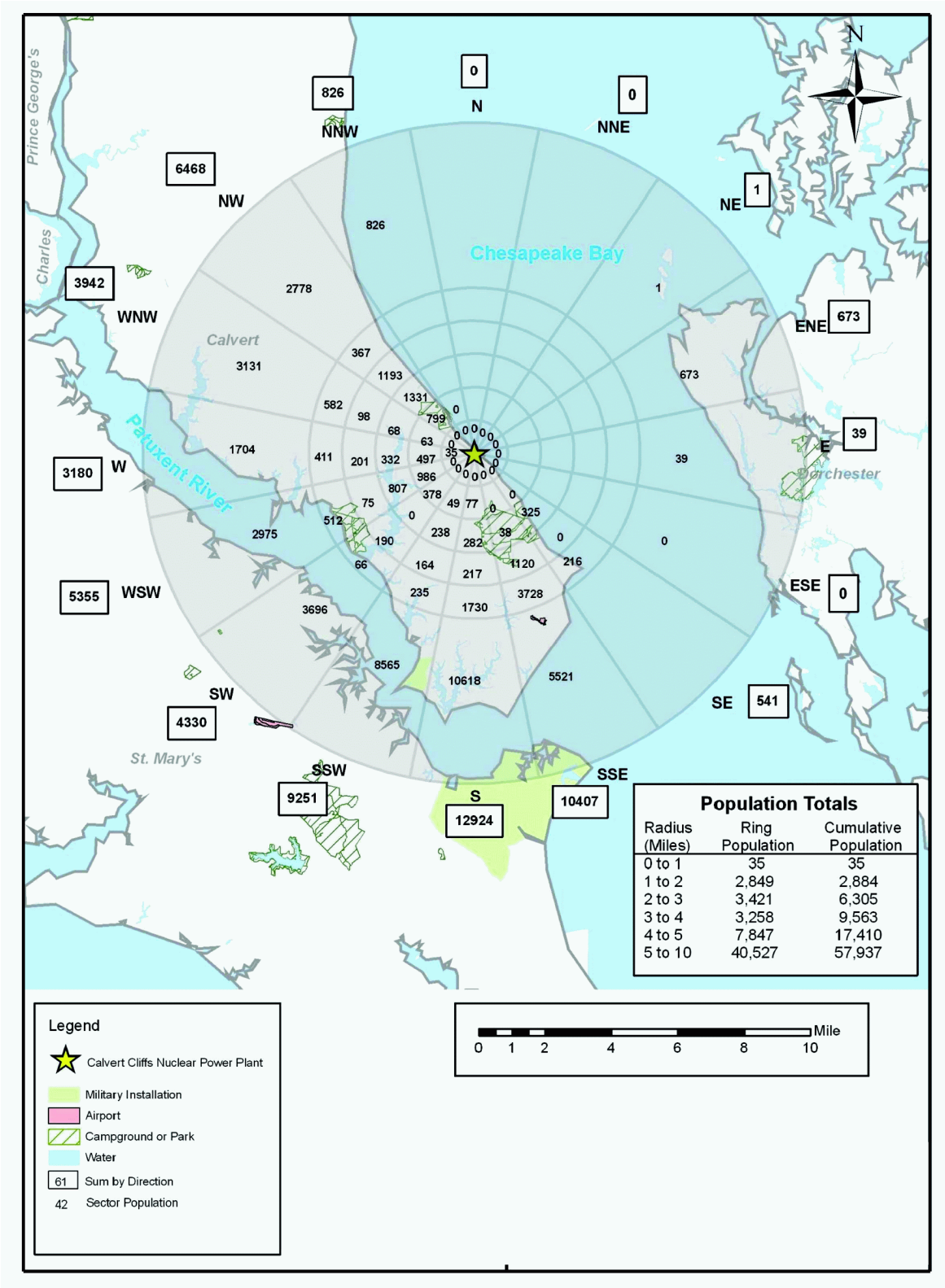

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Figure 2.1-10—{10 mi (16 km) ~~{~~2020~~}~~ Population Distribution}

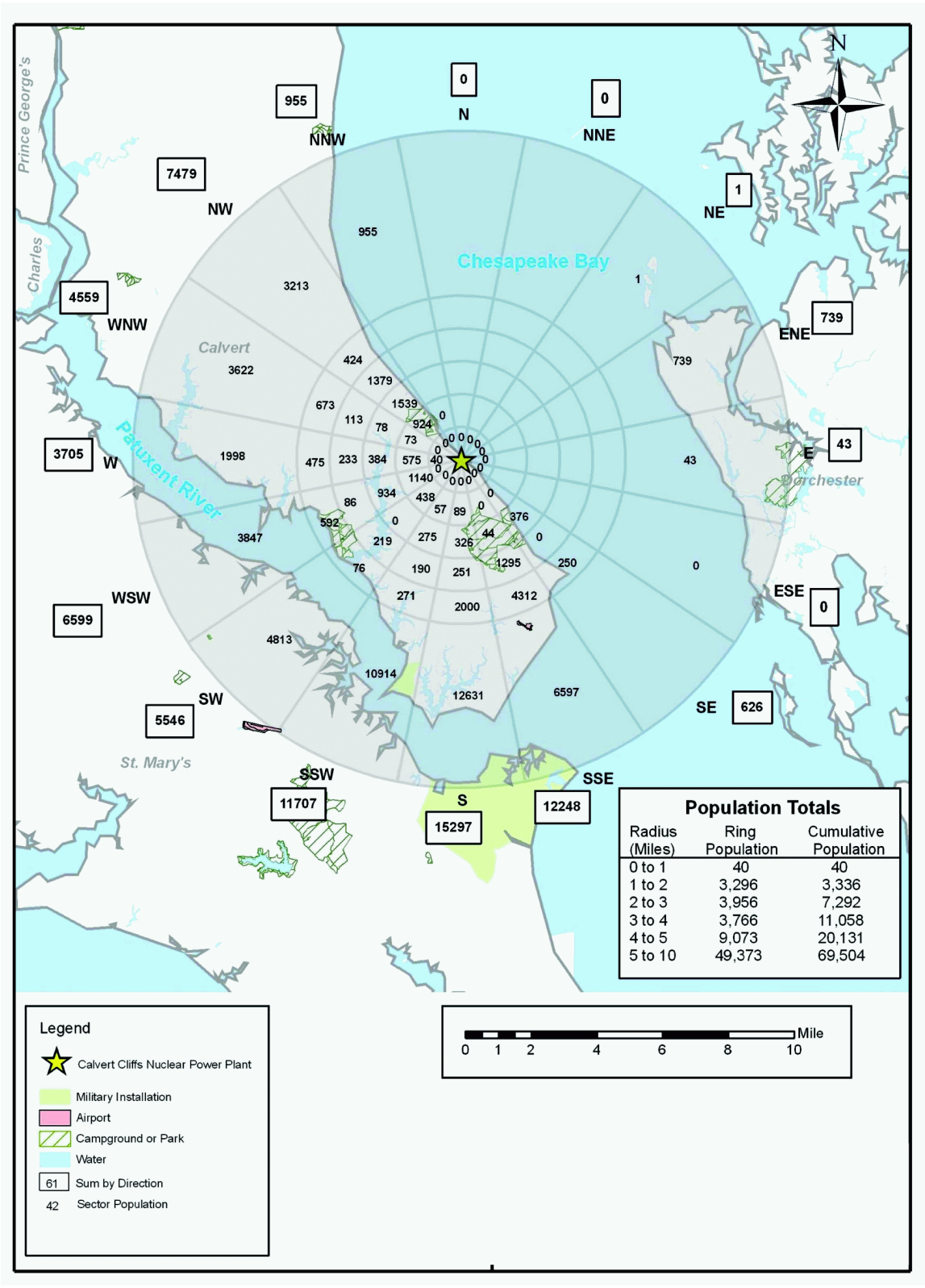

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Figure 2.1-11—{10 mi (16 km) {2030} Population Distribution}

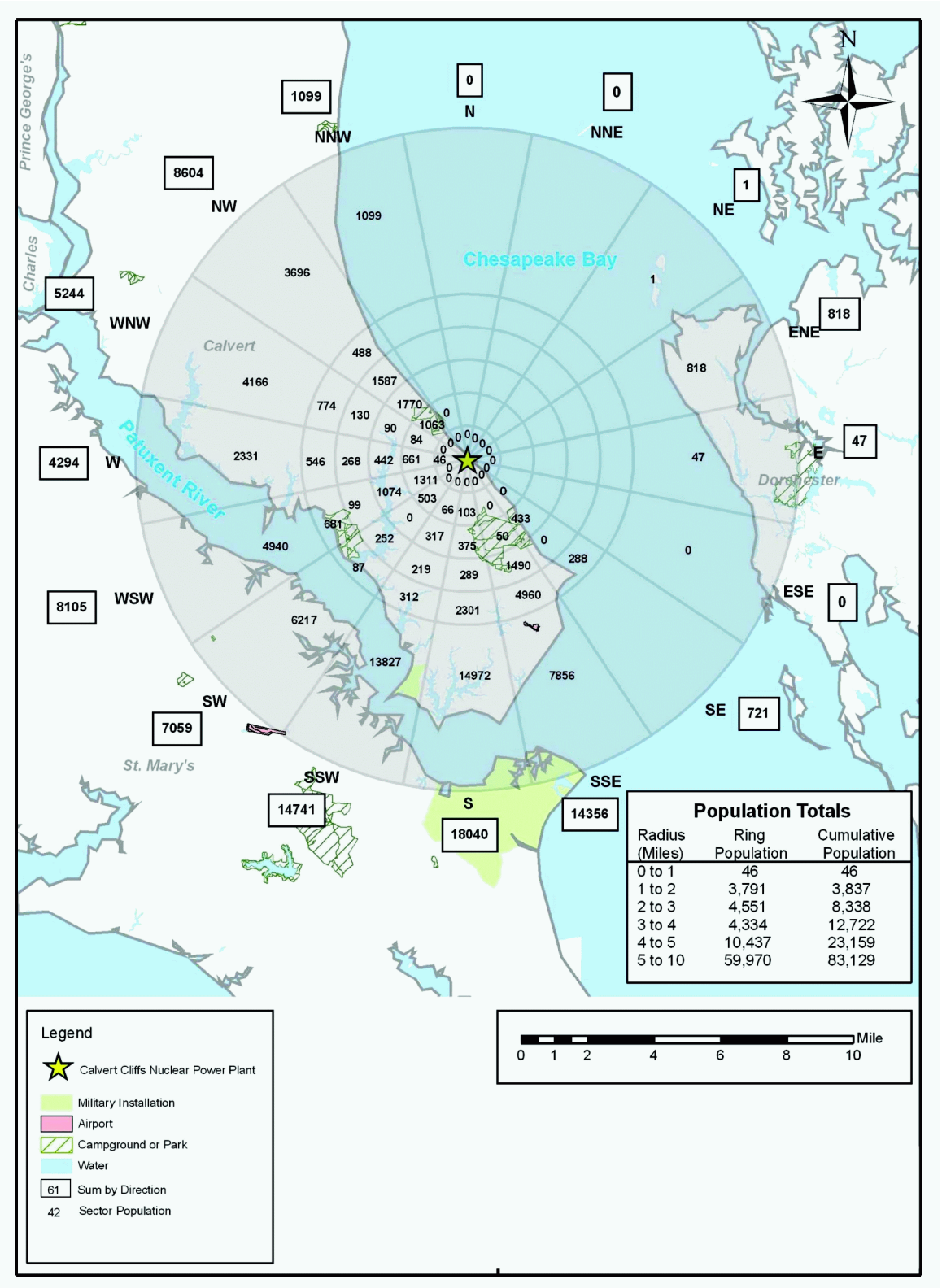

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Figure 2.1-12—{10 mi (16 km) {2040} Population Distribution}

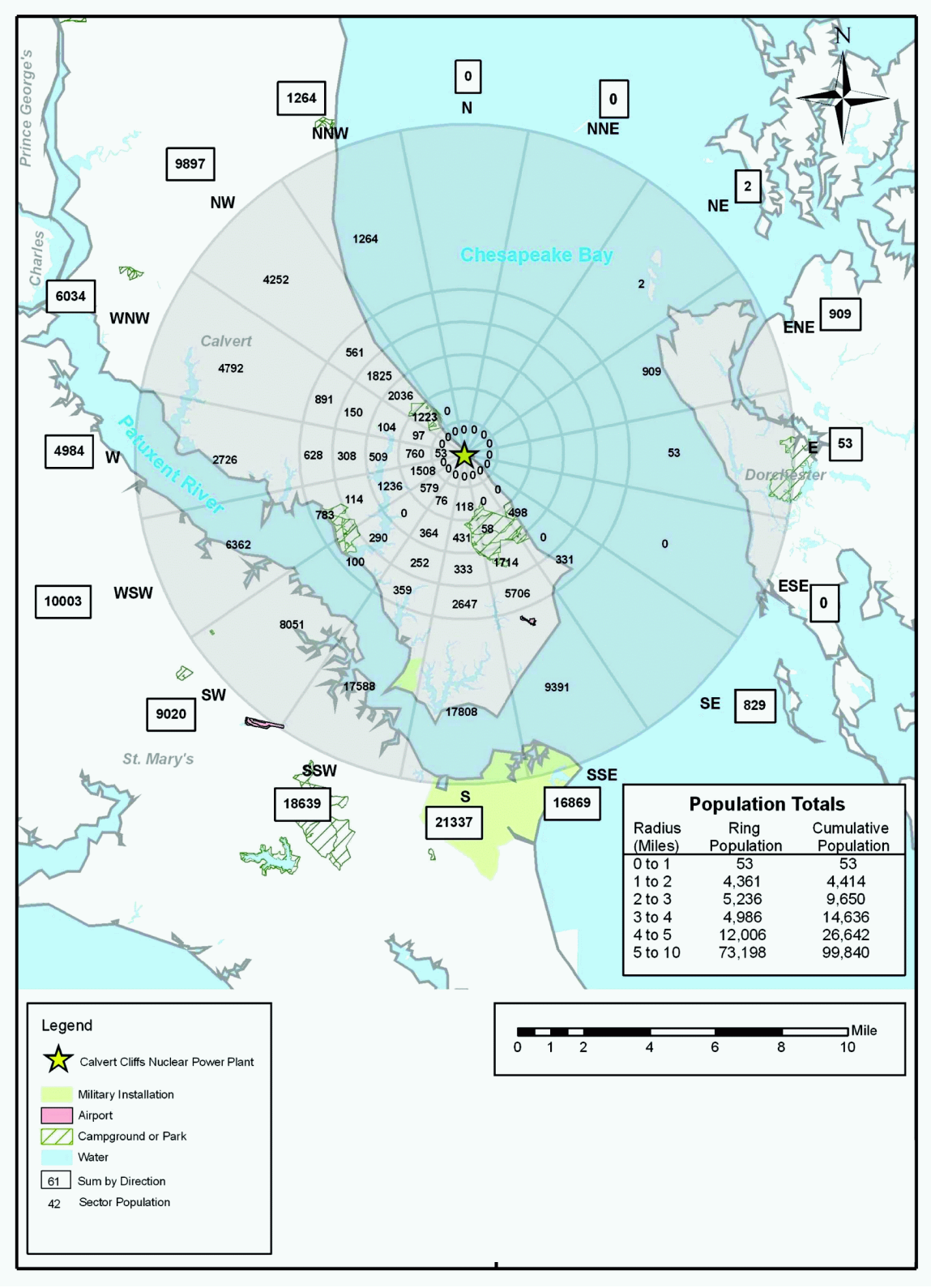

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Figure 2.1-13—{10 mi (16 km) {2050} Population Distribution}

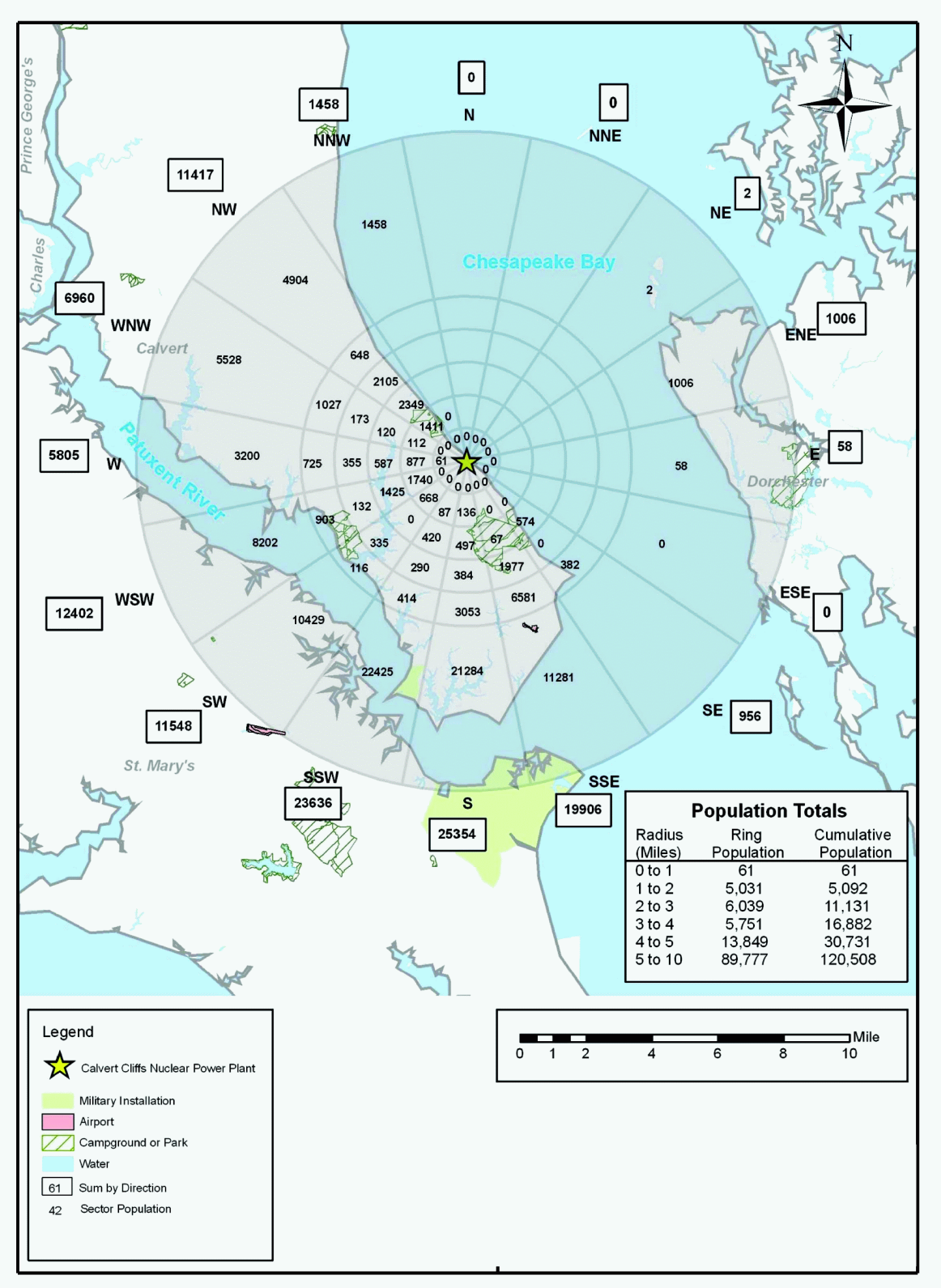

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Figure 2.1-14—{10 mi (16 km) {2060} Population Distribution}

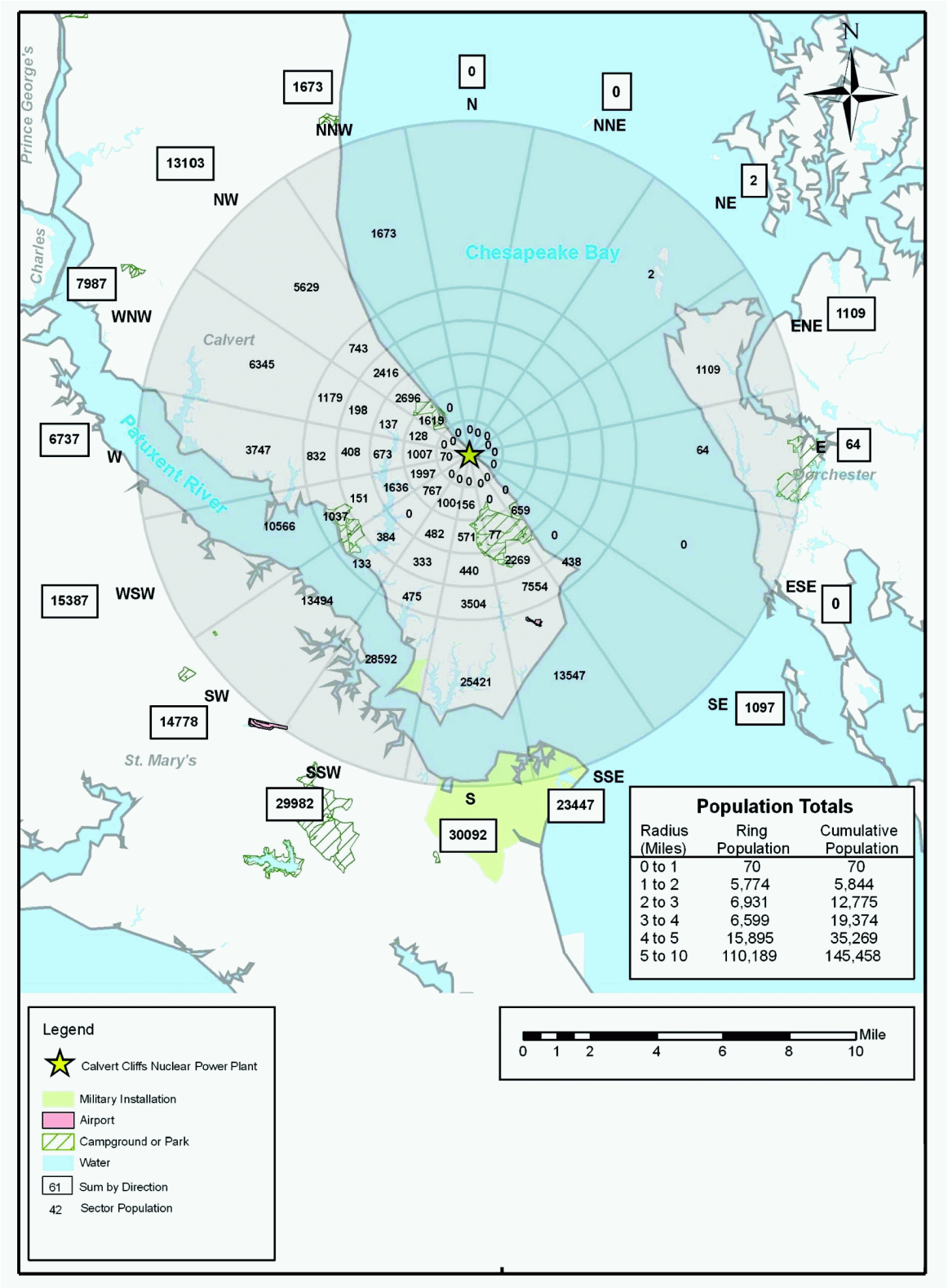

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Figure 2.1-15—{50 mi (80 km) Vicinity}

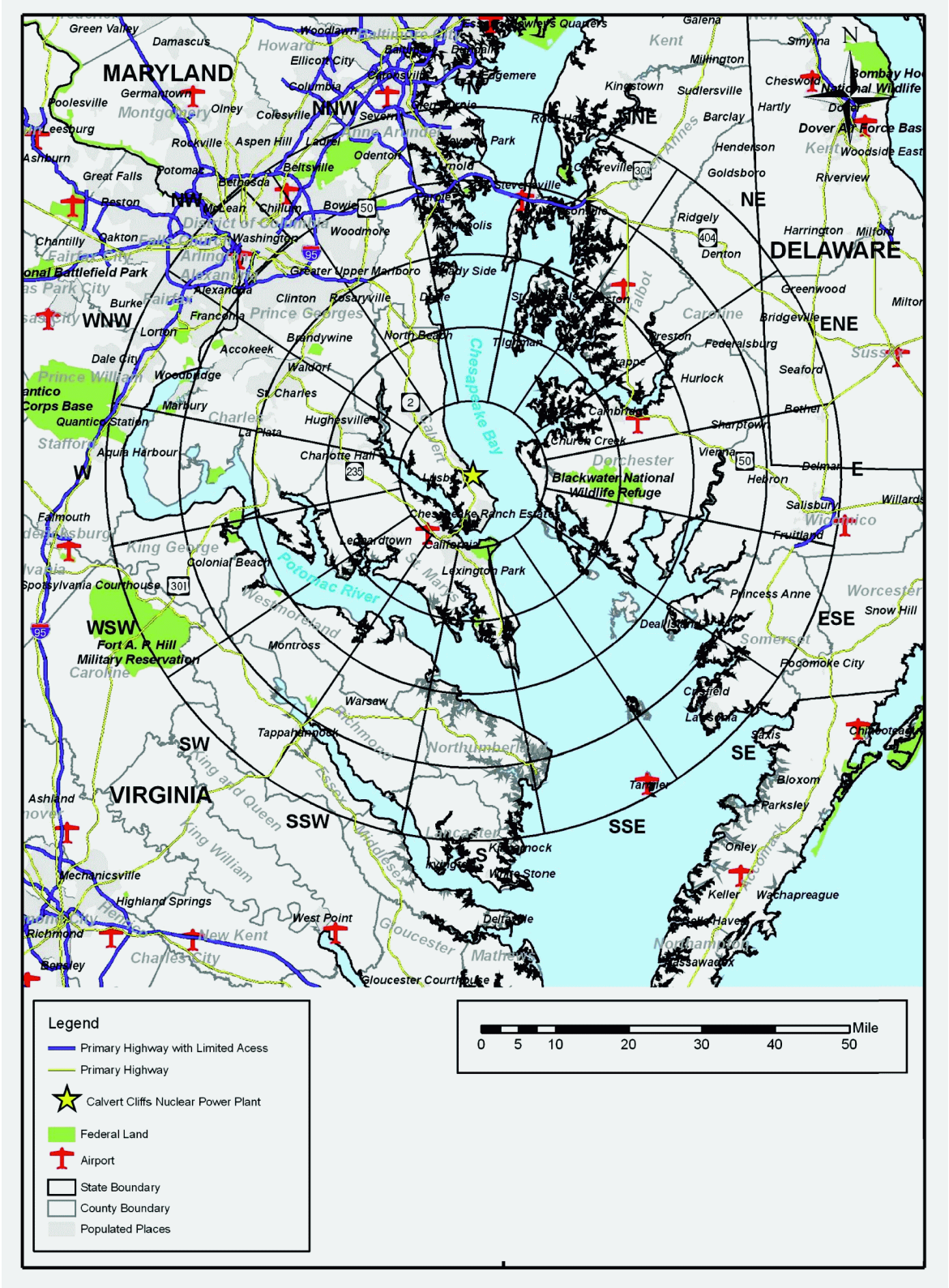

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Figure 2.1-16—{50 mi (80 km) {2000} Population Distribution}

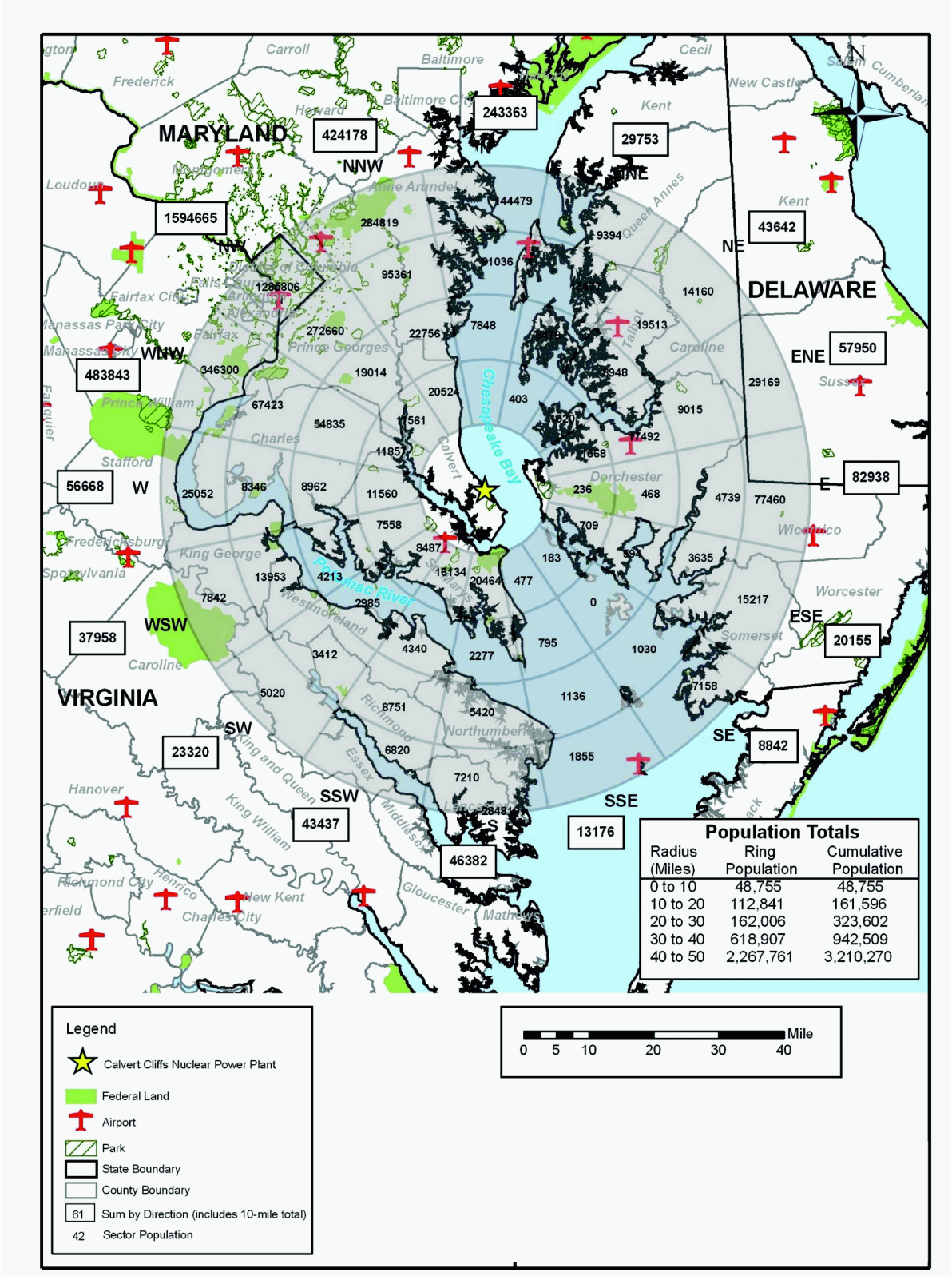

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Figure 2.1-17—{50 mi (80 km) {2010} Population Distribution}

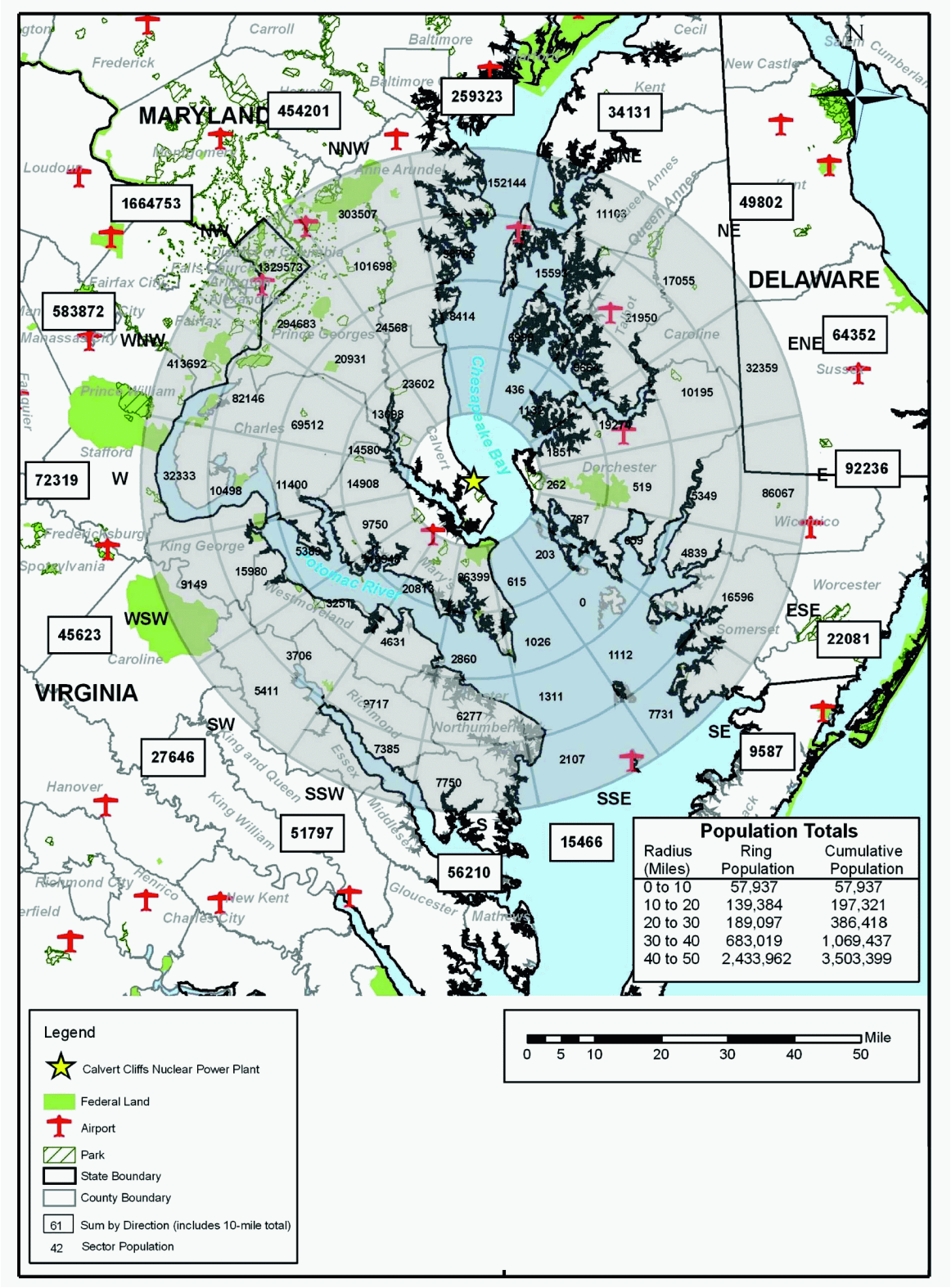

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Figure 2.1-18—{50 mi (80 km) {2020} Population Distribution}

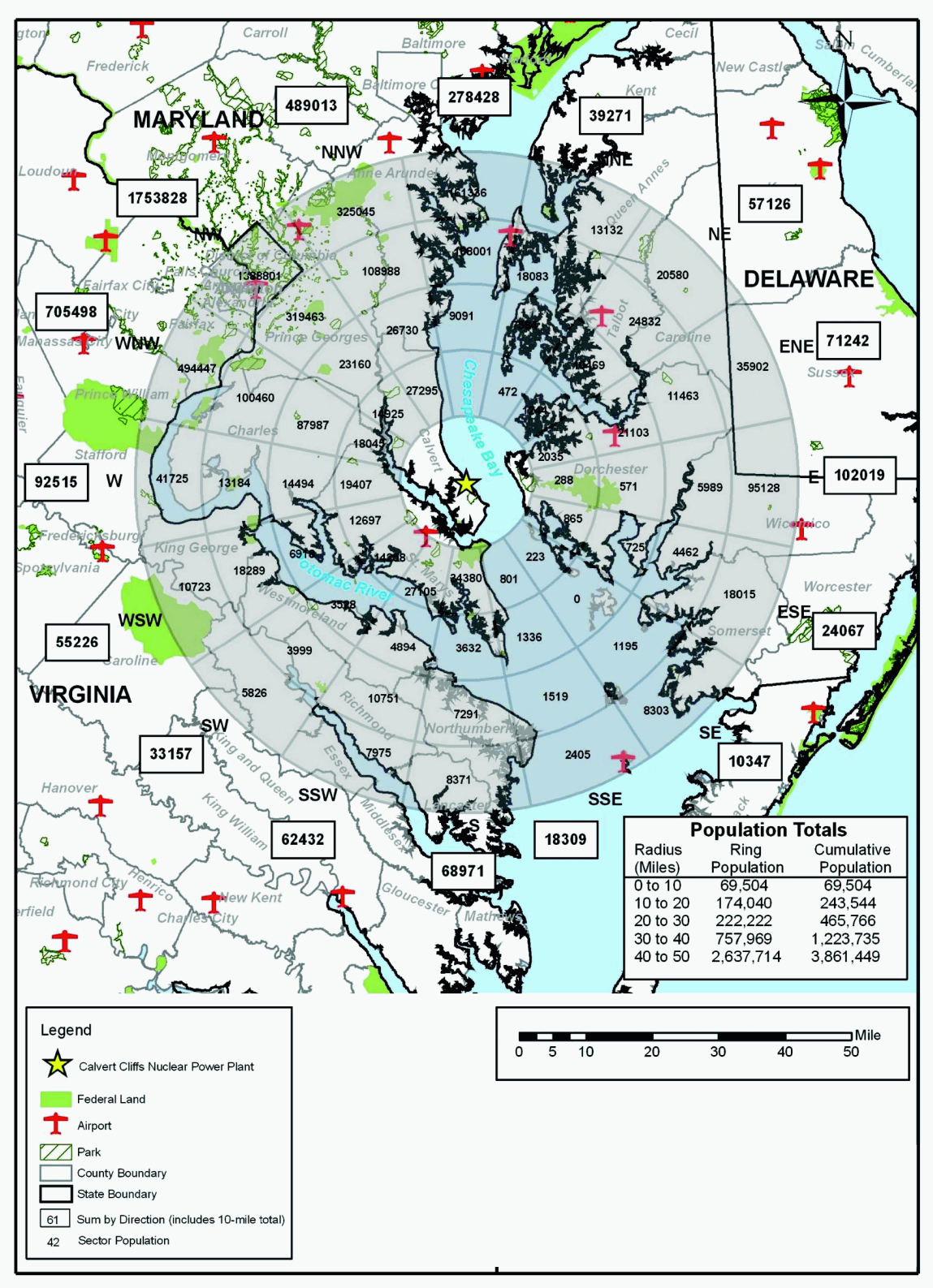

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Figure 2.1-19—{50 mi (80 km) {2030} Population Distribution}

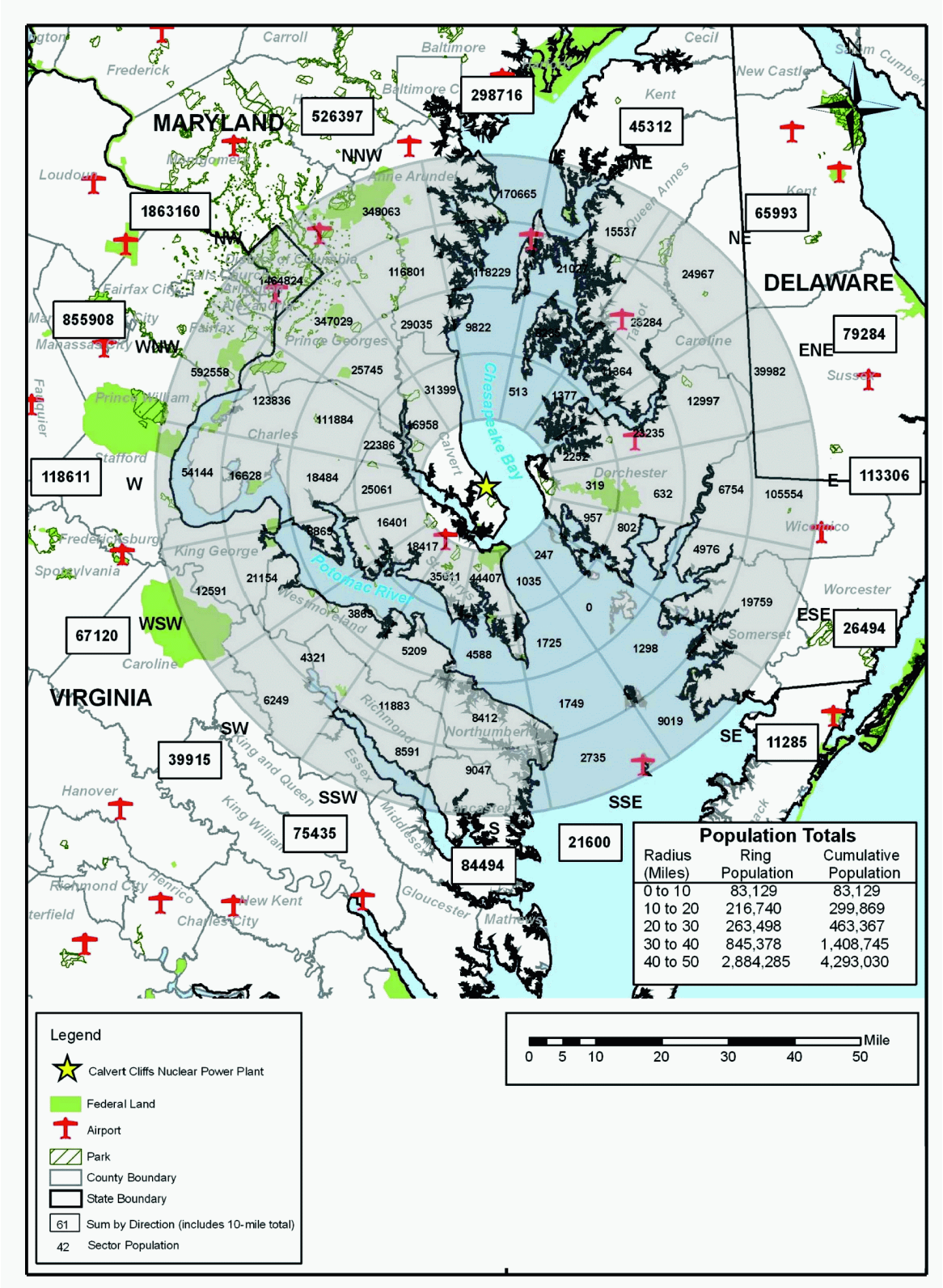

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Figure 2.1-20—{50 mi (80 km) {2040} Population Distribution}

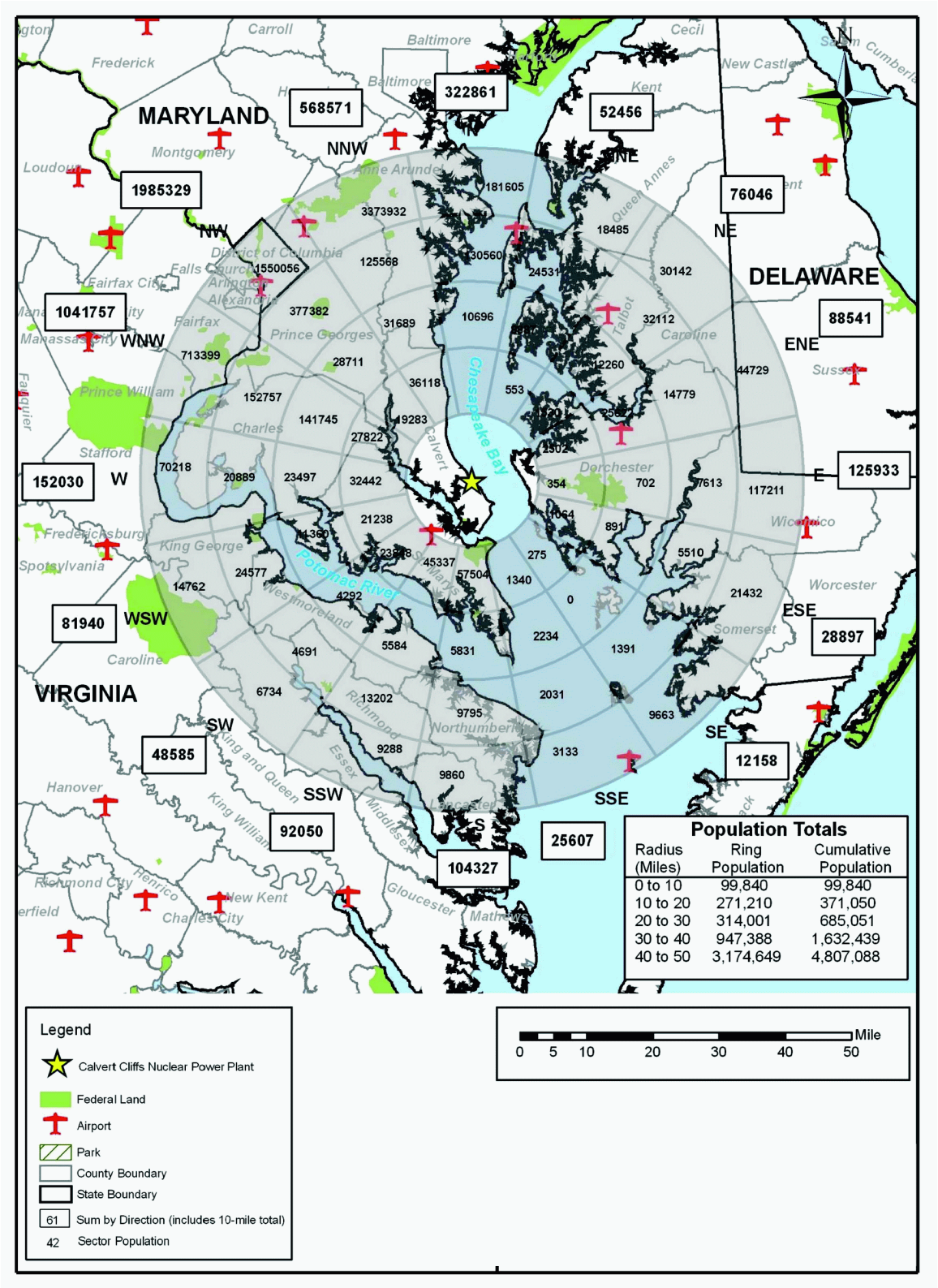

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Figure 2.1-21—{50 mi (80 km) {2050} Population Distribution}

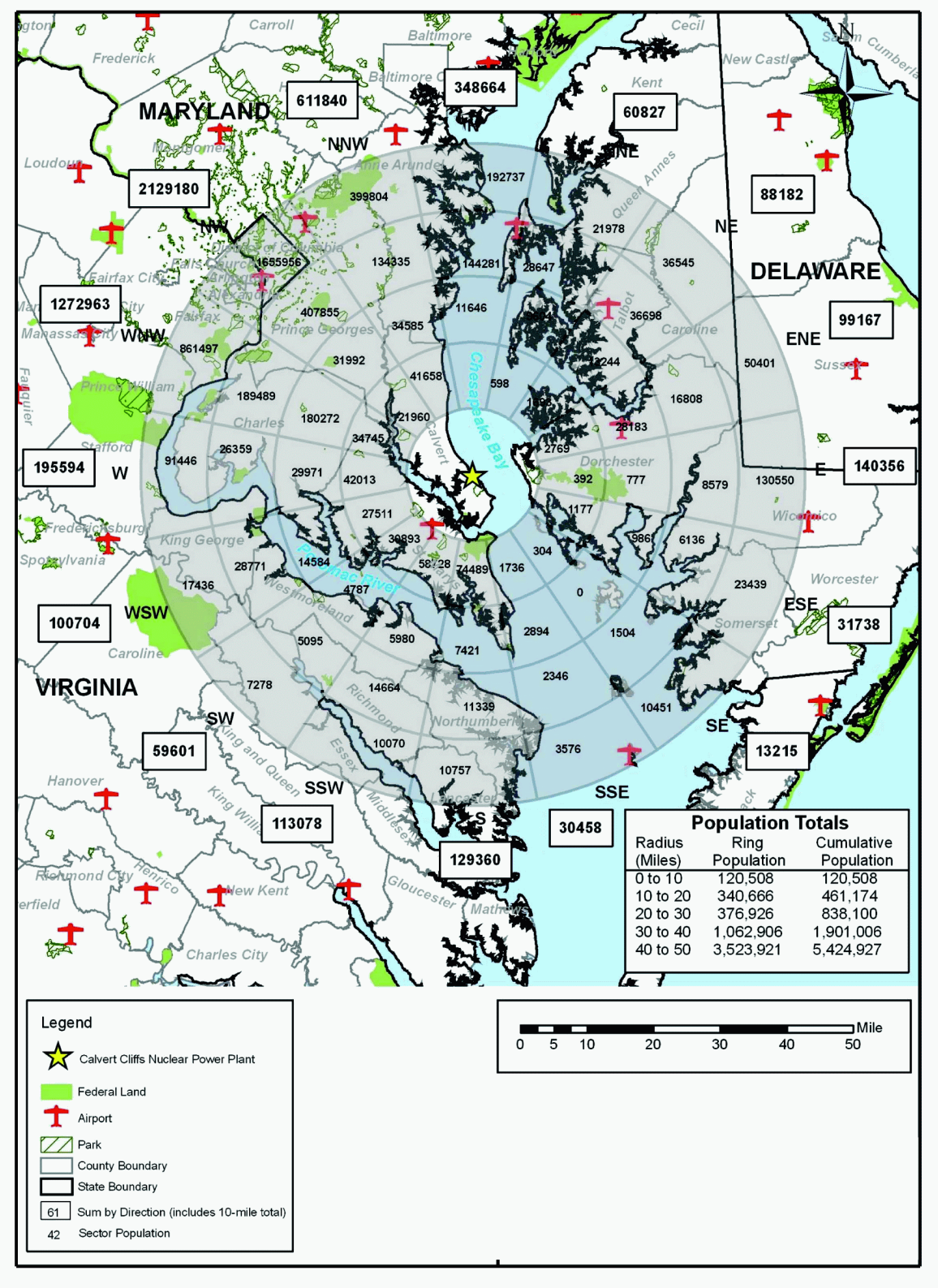

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Figure 2.1-22—{50 mi (80 km) {2060} Population Distribution}

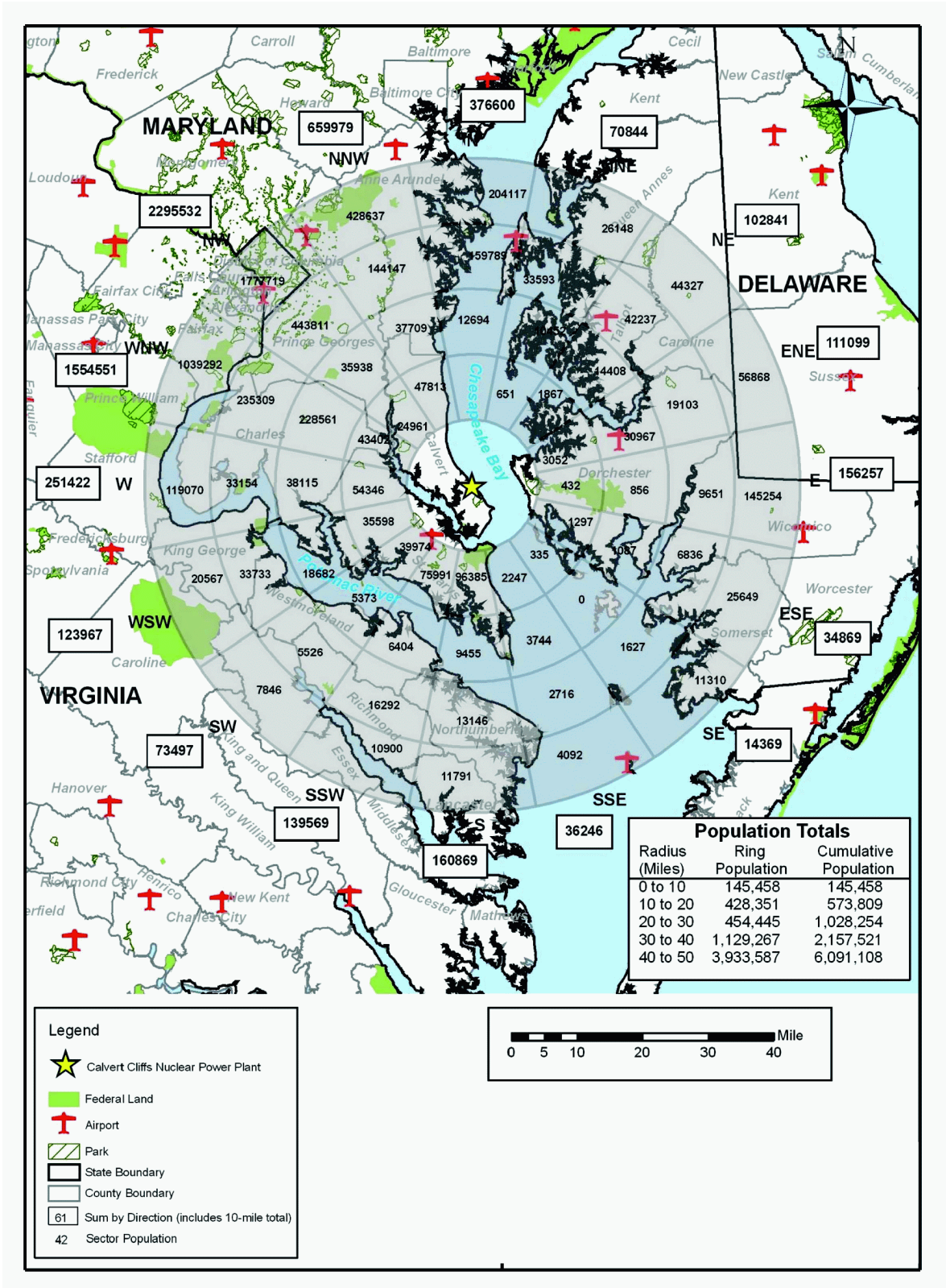

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Figure 2.1-23—{CCNPP Units 1, 2, and 3} Low Population Zone}

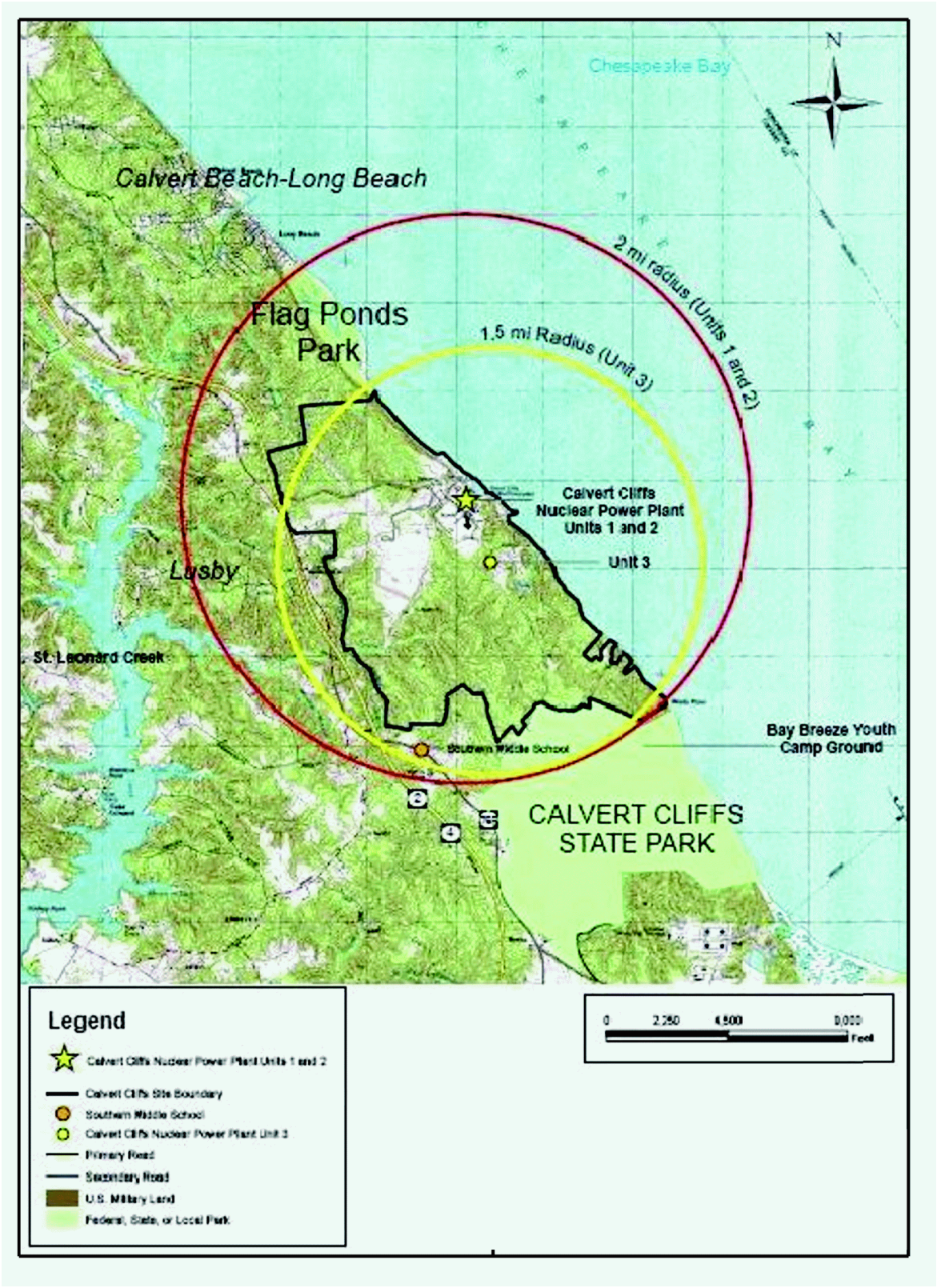

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Figure 2.1-24—{10 mi (16 km) {2015} Population Distribution}

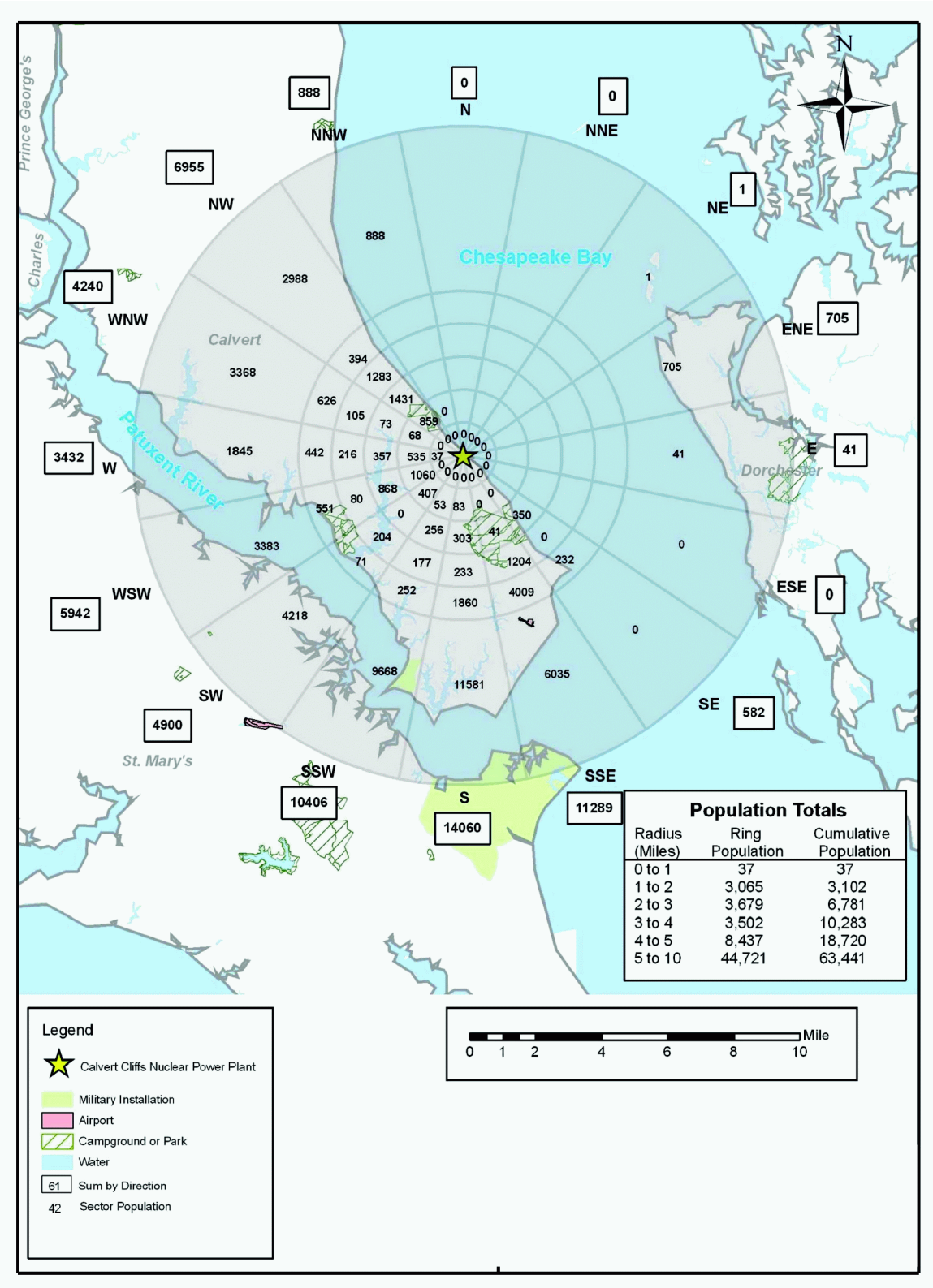

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Figure 2.1-25—{10 mi (16 km) {2055} Population Distribution}

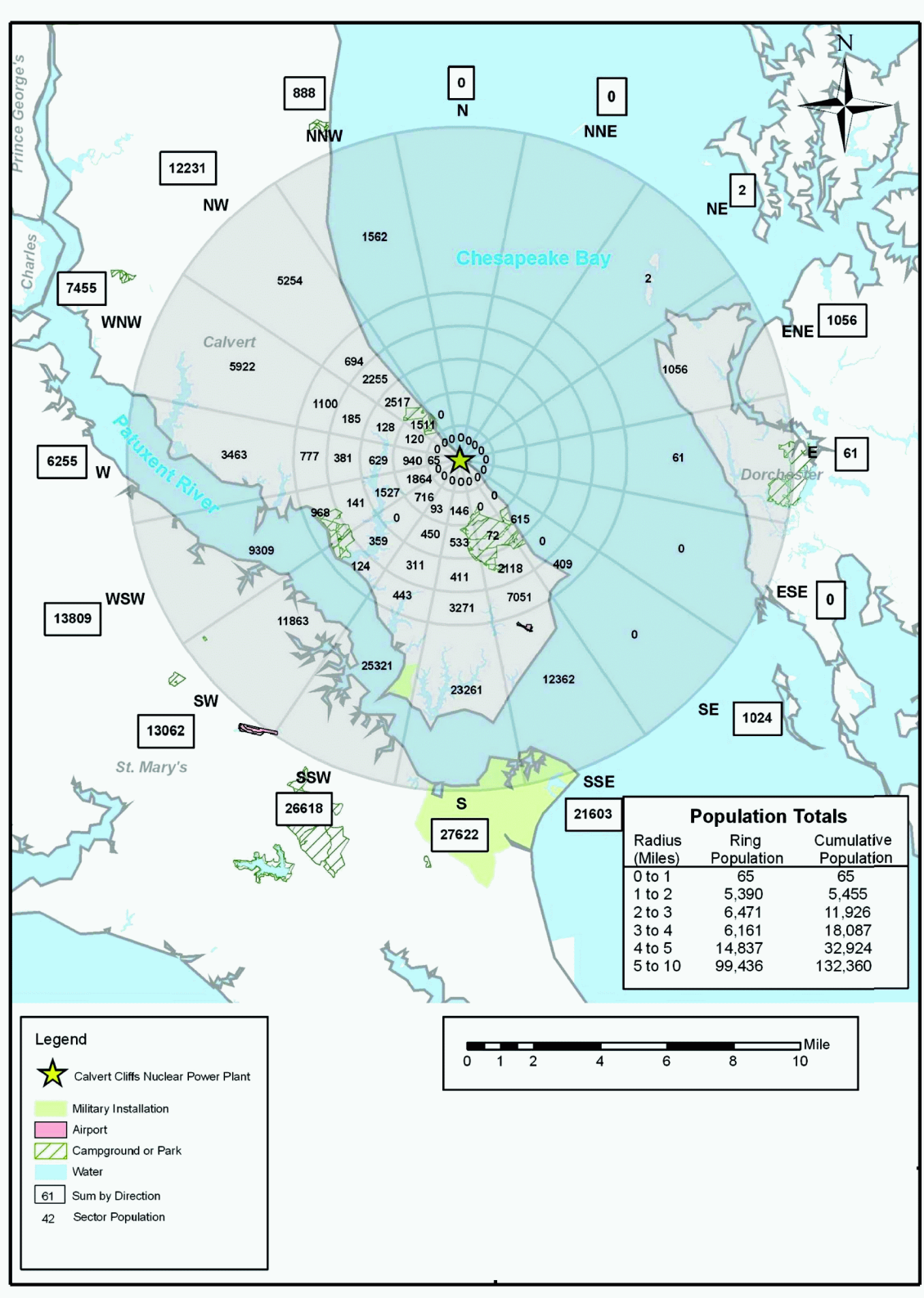

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Figure 2.1-26—{50 mi (80 km) {2015} Population Distribution}

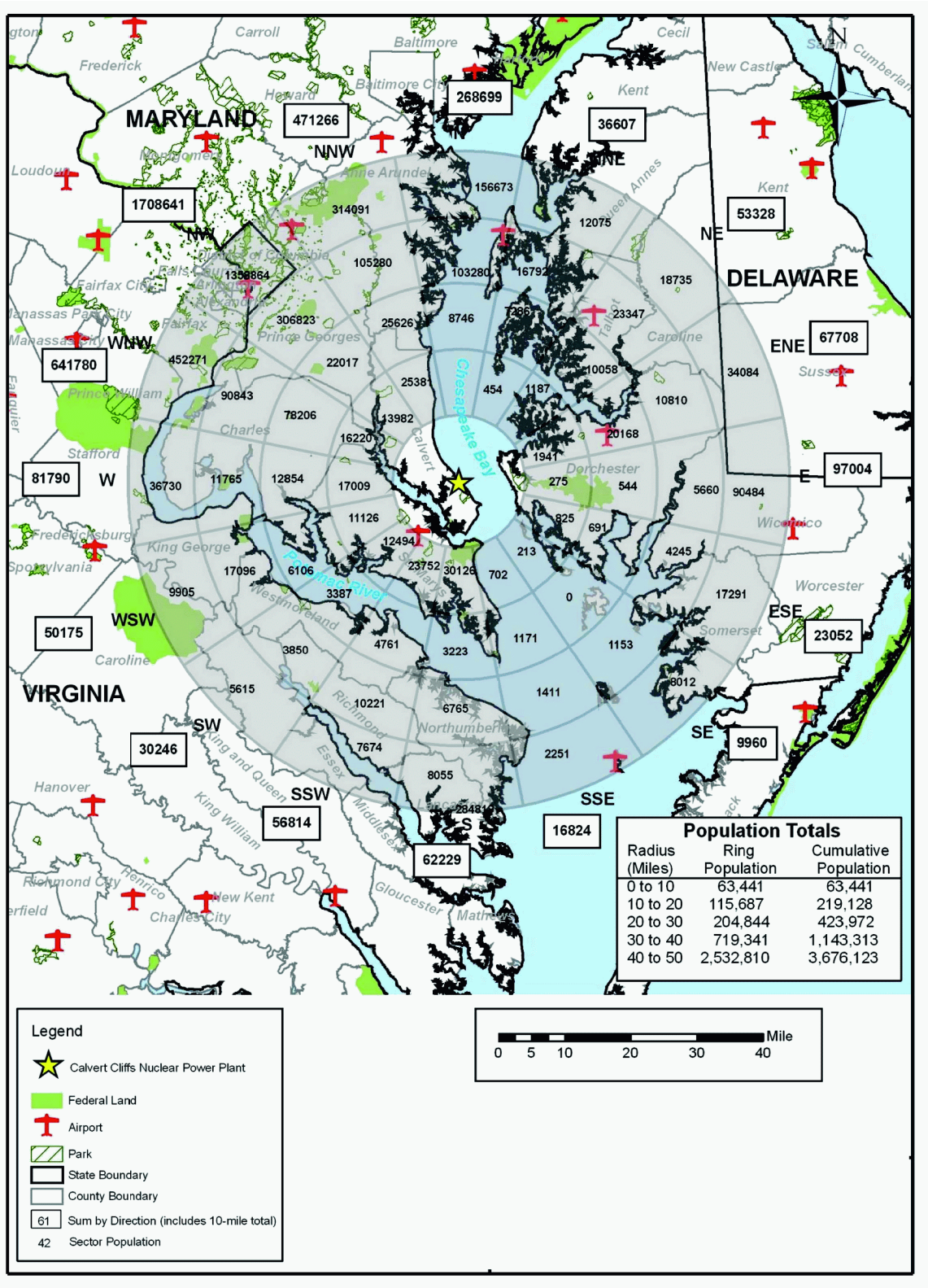

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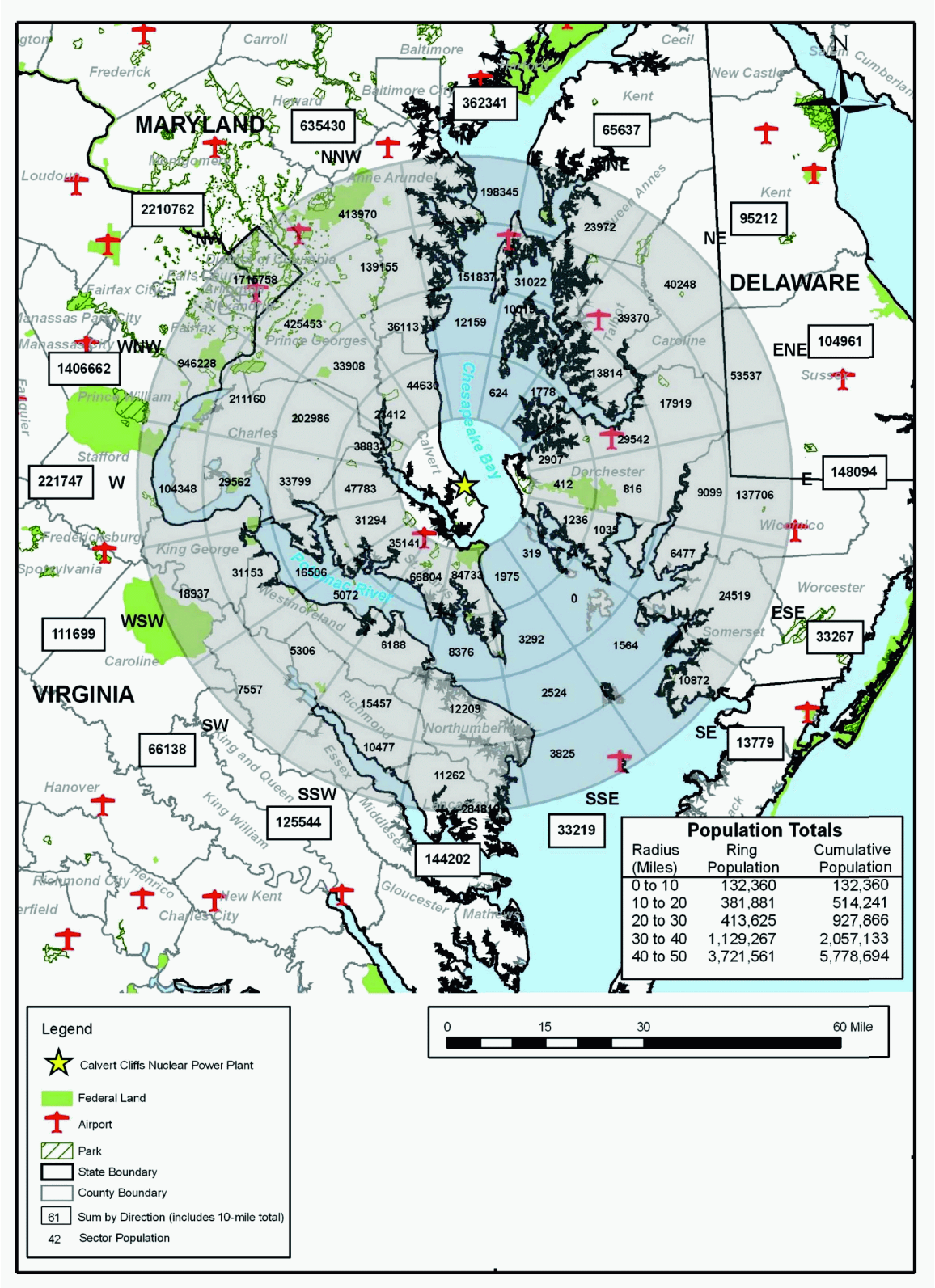
Figure 2.1-27—{50 mi (80 km) {2055} Population Distribution}



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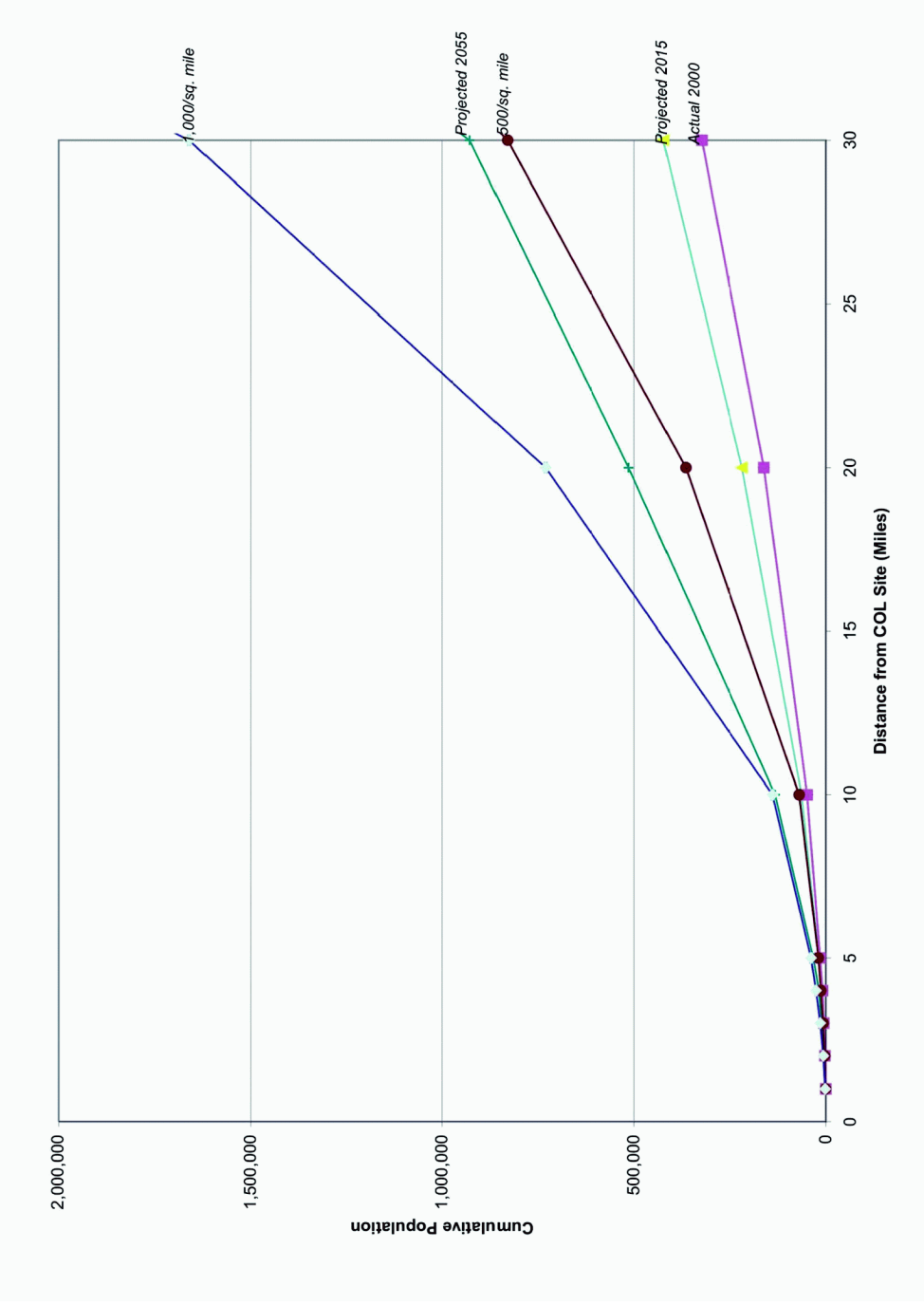

Figure 2.1-28—{Population Compared to NRC Siting Criteria}

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