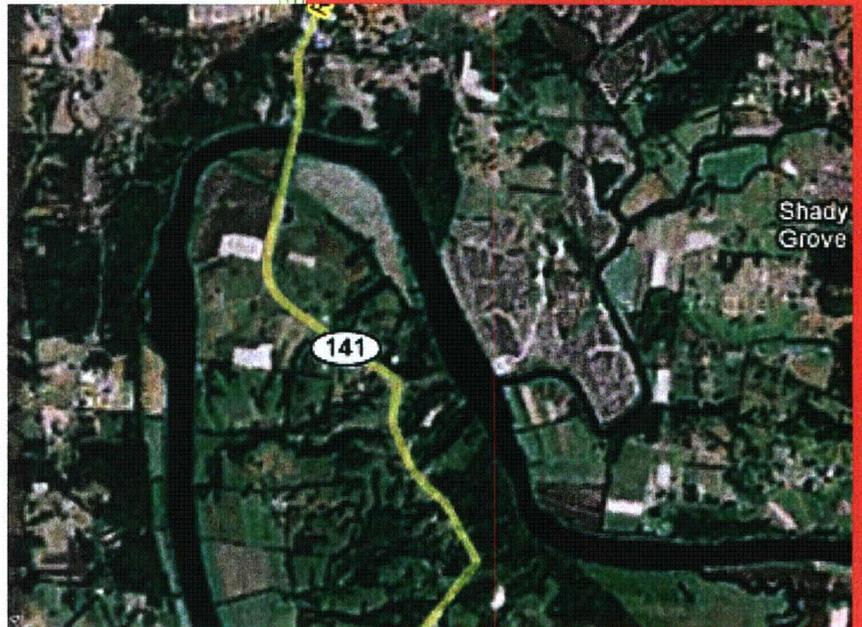


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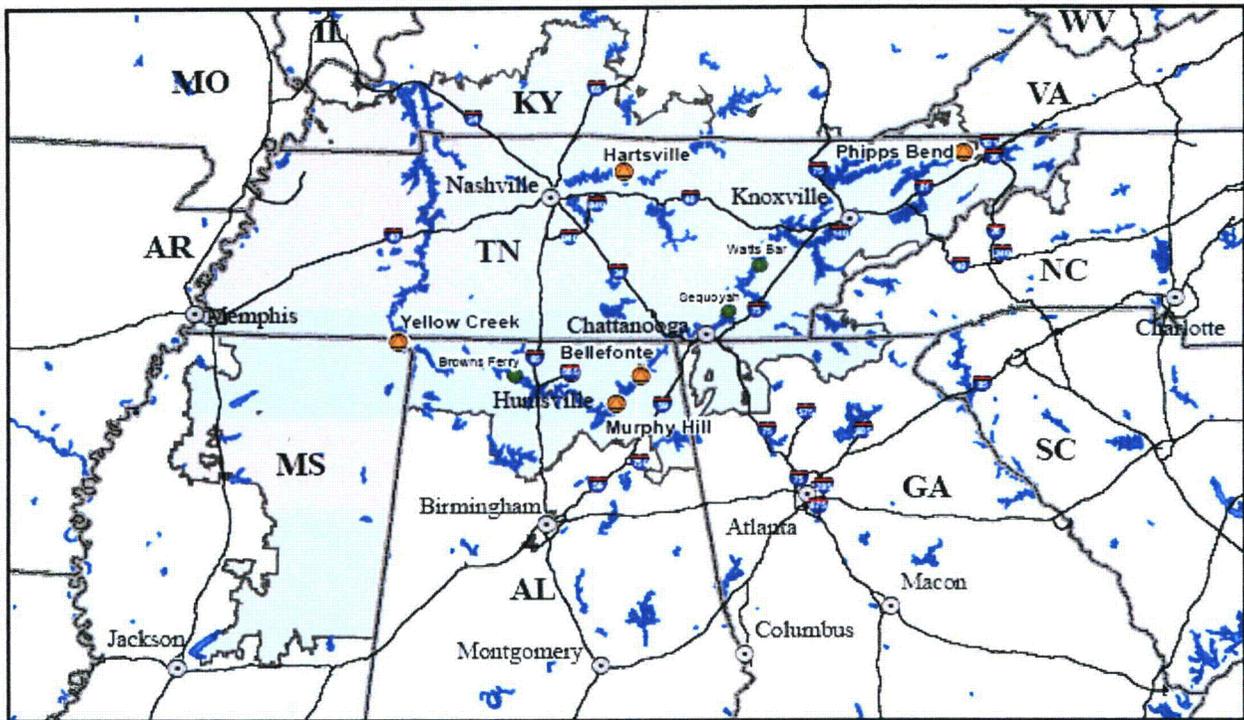
## Hartsville Site-Specific Information



NRC Site Audit

NuStart/TVA/Enercon

3/31/2008



Alternative Site Locations

-  Candidate Nuclear Sites
-  TVA Existing Nuclear Plants
-  TVA Power Service Area



## Summary of Screening Process

TVA evaluated and selected five sites as candidate sites in their ROI for potential siting of a new nuclear facility. Each candidate site meets the eight minimum NUREG-1555 criteria for site selection. The TVA site-comparison process resulted in the choice of BLN as the proposed site for further study.

General description of the alternative brownfield and greenfield sites is in this section. Supporting documentation and additional information are included in individual criteria and site sections in this report. The comparison of data is summarized in the table below.

As discussed in Section 9.3.2.4.2 of the COLA, in addition to the Bellefonte site (BLN), other brownfield sites considered include the former Hartsville Nuclear Plant site (HVN), the former Phipps Bend Nuclear Plant site (PBN), and the former Yellow Creek Nuclear Plant site (YCN).

For each of the four brownfield sites, construction permits were applied for and obtained under the regulations and evaluation procedures of the period. Although nuclear plant construction was never completed at any of these sites, they offer many of the operating nuclear site advantages mentioned in the ER. In addition to the brownfield sites, one greenfield site, the Murphy Hill site (MH), was considered.

**TVA ASE SUMMARY OF RESULTS**

	BLN	HVN	PBN	YCN	MH
<b>Safety &amp; Health Criteria –</b>					
Geologic Evaluation	5	5	5	5	5
Cooling System Suitability	5	5	5	5	5
<b>Plant Safety Evaluation –</b>					
Flooding Potential Evaluation	5	5	5	5	5
<b>Accident Effects Evaluation –</b>					
Population	4	4	4	4	5
Emergency Planning	5	5	5	5	4
Atmospheric Dispersion	4	5	5	5	4
Operational Effects Evaluation	5	5	5	5	5
<b>Transportation Safety Evaluation –</b>					
Cooling Tower Drift	4	5	5	5	4
<b>Environmental Criteria –</b>					
Proximity to Natural Areas	4	3	5	2	5
Construction-Related Effects on Aquatic Ecology	5	5	5	5	5
Construction-Related Effects on Terrestrial Ecology	5	5	5	5	5
Construction-Related Effects on Wetlands	5	5	5	5	5
Operations-Related Effects on Aquatic Ecology					
Thermal Discharge	4	4	2	5	4
Entrainment And Impingement Effects	5	5	5	4	5
Operations-Related Effects on Terrestrial Ecology					
Cooling Tower Drift	4	5	5	5	4
<b>Socioeconomic Criteria –</b>					
Construction-Related Effects	5	5	5	5	4
Highway Access During Construction	5	5	5	5	4
Operations-Related Effects	5	5	5	5	5
Environmental Justice Evaluation	5	5	5	5	5
Land Use	5	4	3	4	2
Cultural Resources	5	4	4	4	5
<b>Engineering and Cost Related Criteria –</b>					
Water Supply Cost	5	5	5	5	5
<b>Transportation –</b>					
Highway Access Cost	5	5	5	5	3
Rail Access Cost	5	3	5	3	2
Barge Access Cost	5	3	3	3	2
Transmission Access Cost	5	2	3	2	2
<b>Site Preparation –</b>					
Land Use And Ownership Assessment	5	3	3	2	2
Topographic Modifications	5	5	5	4	3
Flood Protection Cost	3	4	2	5	2
Cooling Water Cost	5	5	5	5	5
<b>Total</b>	<b>142</b>	<b>134</b>	<b>134</b>	<b>132</b>	<b>121</b>

1 =Least Suitable 5 = Most Suitable

## Description of the Hartsville Nuclear Site

The former Hartsville Nuclear Plant (HVN) site is in Tennessee, largely in Trousdale County, with a small portion in adjacent Smith County. It is situated on the north shore of Old Hickory Reservoir at Cumberland River mile 284, on the 100-year floodplain of the Cumberland River, adjacent to dissected highlands. The HVN units were canceled in 1982 and 1984, respectively. The site is approximately 1931 ac., of which 554 ac. are now the PowerCom Industrial Center. TVA has retained 1377 ac., which include a transmission ROW. The original plans for the HVN site included construction and operation of four nuclear generating units. TVA currently owns enough of the HVN site to construct two nuclear units. The TVA property, which wraps around most of the PowerCom property, has various structures that could be used for industrial or commercial purposes as well as land with development potential. About 400 ac. of the PowerCom property is currently available for industrial use. Buildings and facilities for industrial or commercial use have been constructed at two locations on the Power Com site.

One of these locations, called Village One, has several buildings, with a total of 242,000 square feet, of which 84,000 square feet are occupied. This location is in the northwest corner of the Industrial Center, near the western edge of the original nuclear site. The other location, Village Two, is located in the southwest corner of the original site. Village Two also has several buildings, with a total of 248,000 square feet. Of this, 96,000 square feet are currently used by TVA for storage purposes and 4,000 square feet are used by the state of Tennessee. The remaining 148,000 square feet are vacant. Other developments on the site are from the earlier TVA nuclear construction. Given the location of Village One and Village Two, adequate acreage would still be available for nuclear power construction and operation.

*POPULATION:* Located within the 6-mile radius of the site is the town of Hartsville to the west north-west with a population of approximately 2500. The site is 43 mi. from Nashville, Tennessee and the population within a 50-mi. radius is estimated to be 1.5 million people.

*METEOROLOGY:* For atmospheric dispersion, meteorological conditions at a site are monitored and evaluated as part of determining suitability for siting of nuclear plants. The observation of temperature and wind conditions over time provides input into statistical models. The models can be used to help predict probable atmospheric dispersion of releases. Topographic conditions also influence extreme weather and temperature variations. Sites with better meteorological conditions are rated higher (e.g., limiting conditions affecting the transport and dispersion of plant emission would have a lower rating).

Assessment of the meteorological conditions at the Hartsville site did not indicate any limiting conditions.

*ECOLOGY:* Aquatic habitats that could be impacted by the proposed development on the HVN site are the Cumberland River (Old Hickory Reservoir), and several streams and constructed ponds present on the site. Aquatic communities in adjacent areas of Old Hickory Reservoir may be impacted by activities undertaken in riparian zones that change the topography of the shoreline, reduce the usefulness of shoreline areas for spawning and feeding, or alter shoreline vegetation, particularly the loss of a wooded shoreline.

The bank along the Cumberland River is almost entirely wooded, with sparse understory vegetation in areas immediately adjacent to the river. Most areas on top of the riverbank, and adjacent to formerly

cleared areas are very dense, woody, old field habitats, except for small areas where access points and structures were constructed in association with the canceled nuclear plant.

TVA biologists collected monthly experimental gill net and electrofishing samples near the site from September 1992 through January 1993. Thirty-five species, none of which are protected species, were collected. Gizzard and threadfin shad comprised the largest group of fish in the sample; game fish that are more abundant were bluegill, largemouth bass, and sauger. Several mussel species federally listed as endangered have historically been collected from the Cumberland River near this site.

Important aquatic species potentially found at the HVN site include the dirty darters, which are considered in need of management by the TWRA and have been reported from Dixon Creek adjacent to the HVN site. Several federally listed mussel species were identified in previous surveys and were expected to be found in the Cumberland River near the proposed industrial park. Surveys by divers in January 2001 in the Cumberland River, in the vicinity of the site revealed that a once-thriving population of endangered mussels could no longer be found.

Distinct groups of terrestrial wildlife are found in association with the vegetation types occurring on the HVN site. Common amphibians and reptiles often found in old field habitats include American toad, upland chorus frog, and black racer. Birds found in this type of habitat include song sparrow, eastern towhee, eastern wild turkey, and black vulture. Resident mammals include eastern cottontail rabbit, white-tailed deer, and coyote. Amphibians and reptiles commonly found in riparian habitats include bullfrog, green frog, red-spotted newt, and northern water snake. Birds found in this type of habitat include Carolina wren, eastern phoebe, barred owl, and American woodcock. Mammals include beaver, muskrat, raccoon, and white-tailed deer. Seeps and damp rock outcrops with small pools of water are found on the site. These areas provide suitable habitat for frogs and salamanders and are likely used as a water source by a variety of wildlife species.

Amphibians and reptiles at HVN found in upland woodlands include spring peeper, gray tree frog, eastern box turtle, and gray rat snake. Birds commonly found in this type of habitat include red-tailed hawk, American crow, eastern tufted titmouse, and Carolina chickadee. Mammals common to the area include eastern gray squirrel, white-footed mouse, woodland vole, and eastern chipmunk.

Several species of game animals occur on the HVN project area. The heavily modified habitats, which are abundant on the site, provide suitable habitat for white-tailed deer and eastern wild turkey. These species are quite common in the project area. Other game species such as beaver, eastern gray squirrel, eastern cottontail rabbit, American woodcock, and northern bobwhite quail are also found on the site. Ponds and wetlands on the area provide resting and foraging habitat for waterfowl including wood duck, Canada goose, mallard, and hooded merganser.

The TVA Regional Natural Heritage Program database indicates that three state-listed animal species — Bewick's wren, Allegheny woodrat, and southeastern shrew — occur in Smith and Trousdale counties. The gray bat, which is on the federal list of endangered species, is also known to occur in Smith County.

The U.S. Fish and Wildlife Service (USFWS) list of threatened, endangered and candidate species for Smith and Trousdale counties, Tennessee, consists of 15 plant and animal species, including one mammal species, one bird, ten mollusk and one plant species. The TVA Regional Natural Heritage database identified three terrestrial animal species that may occur on or adjacent to the site. Of the five species potentially present, only the gray bat and bald eagle have been observed near the Hartsville site.

No federally listed threatened or endangered species are known to occur on, or immediately adjacent to, the Hartsville site.

The Hartsville Alternative site is located in the Outer Nashville Basin Ecoregion III, a part of the Interior Plateau Ecoregion IV. The Interior Plateau is diverse and extends from southern Indiana and Ohio to northern Alabama. The natural vegetation is primarily oak-hickory forest, with some areas of bluestem prairie and cedar glades. Specifically, the Outer Nashville Basin has a rolling hilly topography with higher elevations than the Inner Basin. The region's limestone rocks and soils are high in phosphorus and commercial phosphate is mined. Deciduous forest with pasture and cropland are dominant land covers. Cedar glades are commonly found within the Nashville basin and globally rare glade communities are recognized from the region around the Hartsville project area. According to NatureServe (2007), the following is a list of rare plant communities known to occur in the Nashville Basin of TN: Interior Low Plateau Limestone Glade Ephemeral Pool (G3), Southern Limestone Glade Margin Shrubland (G3), Central Limestone Glade (G2), Limestone Seep Glade (G2), Limestone Glade Streamside Meadow (G2), and Limestone Annual Grass Glade (G3).

A review of the TVA heritage database indicates that no federal and one state-listed species (*Arenaria fontinalis*-water stitchwort) is known to occur within five miles of the Hartsville site. In addition, an historical record of *Leavenworthia exigua* var. *exigua* (glade cress), a species of special concern, was recorded from a rocky wet cedar glade and the federal candidate species, *Lesquerella globosa* (Short's bladderpod) is present in both Smith and Trousdale Counties, TN.

Due to the disturbance associated with the Hartsville Alternative Site and a review of maps and knowledge of rare plants and rare plant communities in the region, habitat for these rare species or the globally rare plant communities are not likely to occur within or adjacent to the Hartsville site; therefore no significant impacts to these botanical resources are expected from the proposed action.

**NATURAL AREAS:** The HVN site has been used for hunting in cooperation with the Tennessee Wildlife Resource Agency (TWRA), but the site has been deleted as a hunting area in the new 2007 – 2008 TWRA Hunting Guide. This site is also immediately adjacent to the Cumberland River No. 2 State Mussel Sanctuary and is approximately 2 mi. from Old Hickory Wildlife Management Area.

**WETLANDS:** There are approximately 36 ac. of emergent and forested wetlands at the HVN site. Most of these are associated with Corley Branch, Dixon Creek, and the shoreline of Old Hickory Reservoir (Cumberland River). Most of these wetlands are concentrated around the eastern, western, and southern boundaries of the survey area.

Stringent environmental laws regulate dewatering or filling wetlands. For purposes of this comparison, most potential construction areas are located sufficiently far away that it will be possible to avoid most wetlands. Thus, potential adverse impacts from dewatering or filling are expected to be avoided or minimized such that any potential impacts would be insignificant, and all sites are rated equally.

**CULTURAL RESOURCES:** Northern middle Tennessee has been an area of human occupation for the last 12,000 years. Prehistoric land use and settlement patterns vary, but short- and long- term habitation sites are generally located on floodplains and alluvial terraces along rivers and tributaries. Specialized campsites tend to be located on older alluvial terraces and in uplands. European interactions with Native Americans associated with the fur trading industry in this area began in the seventeenth and eighteenth centuries, with the latter half of the eighteenth century marked by small skirmishes and ambushes

between settlers and Native American groups. By the end of the eighteenth century, land in the Nashville Basin had been granted to veterans of the Revolutionary War. Agriculture dominated the economies of both Smith and Trousdale Counties in the nineteenth and well into the twentieth century. Economic activities in Smith County now center on large industry and mining of the county's rich zinc deposits. Trousdale County remains linked to its agricultural roots, with the city of Hartsville becoming a thriving center for the loose-leaf tobacco market in the twentieth century.

Prior to and during construction of the Hartsville Nuclear Plant, archaeological surveys were conducted within the project location. These surveys identified 40 archaeological resources. Several sites that were to be adversely impacted within the project area were excavated. A recent archaeological survey suggests that approximately eleven potentially eligible National Register of Historic Places sites still exist within the project area. No historic/architectural sites were recorded in the project area; however no systematic historic/architectural survey has ever been conducted in the project area. Ten historic properties are listed on the National Register of Historic Places (NRHP) in Smith County, and seven properties are listed in Trousdale County. None of the properties are within the project APE or in the immediate vicinity.

*TRANSPORTATION:* Sites are compared with respect to costs for providing access by highway, rail, and barge. Thus, three transportation criteria are considered. The purpose of the first transportation criterion is to rate sites based on the length of additional or new highway construction required to provide car and truck access.

Highway access for HVN was previously upgraded in anticipation of construction. While some additional highway upgrades may be necessary to support construction and operation of new nuclear power plants, no significant differential highway access development costs are expected.

Hartsville does not have rail access, and construction of a barge uploading facility and access road would be required.

*TRANSMISSION:* The HVN site would require 397 mi. of 500-kV and 8 mi. of 161-kV transmission line to be constructed on 9720 ac. of transmission ROW. It would also require additional assessment for threatened and endangered species, cultural resources, land use, and potential impacts to water resources.

*GEOLOGY:* The HVN site lies within the Nashville Dome tectonic province. The design criteria for a plant at that site would be governed by a reoccurrence of a major earthquake in the Reelfoot Tectonic Structure west of the Nashville Dome. Analysis of a major earthquake in the Reelfoot Structure shows that the maximum intensity felt at the HVN site would be MM VII. The maximum acceleration for intensities of this level was estimated to be 0.14 g for safe shutdown earthquakes.

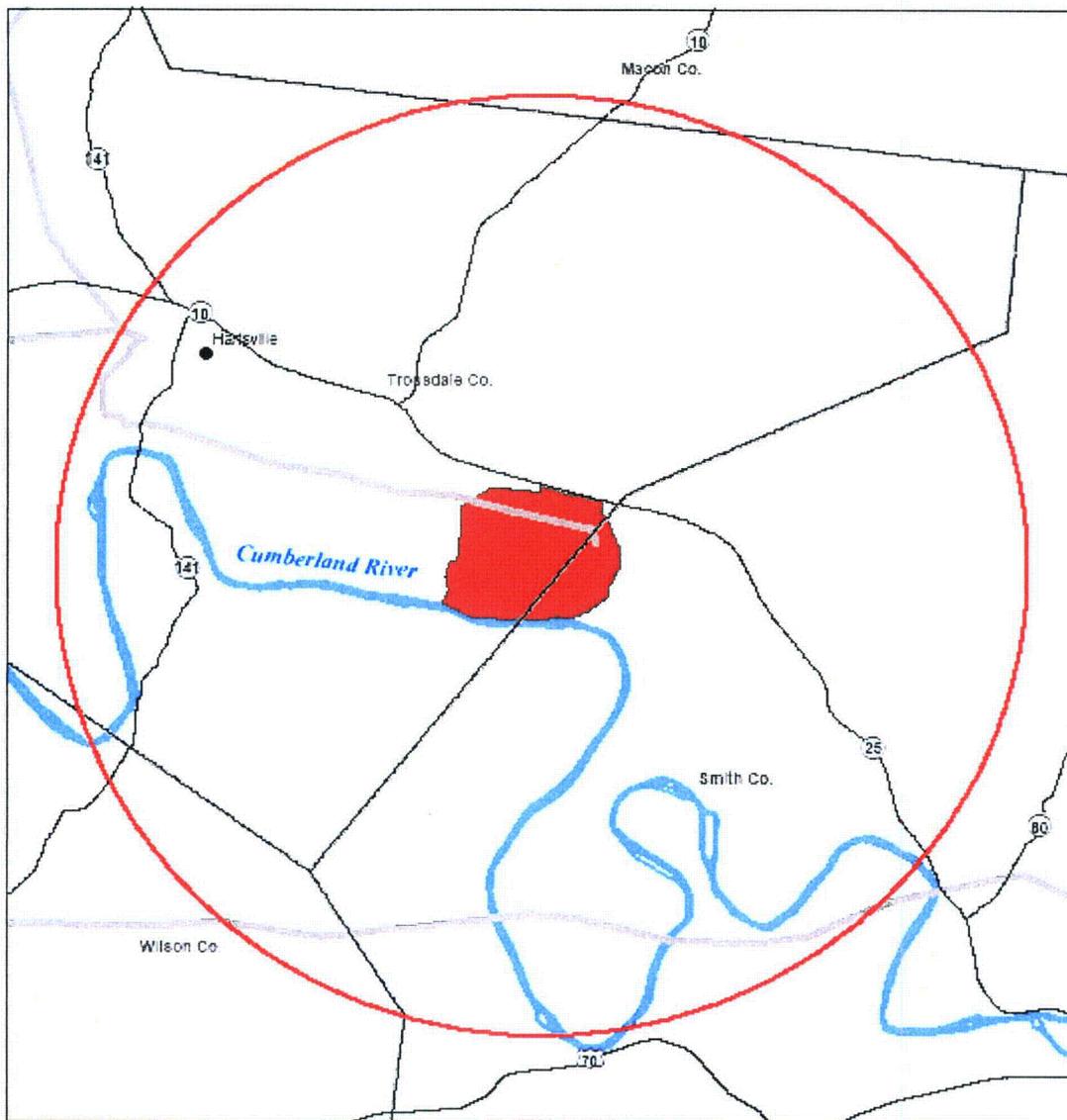
## **Hartsville Site Figures**

Hartsville Site Vicinity Map—Prepared by TVA, William H. Keeler III

Hartsville Site Land Ownership Status Overlay on Topographic Map— Prepared by TVA, William H. Keeler III

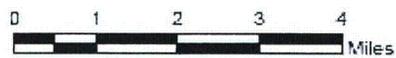
Hartsville Site Aerial Photo with Site Boundary— Prepared by TVA, William H. Keeler III

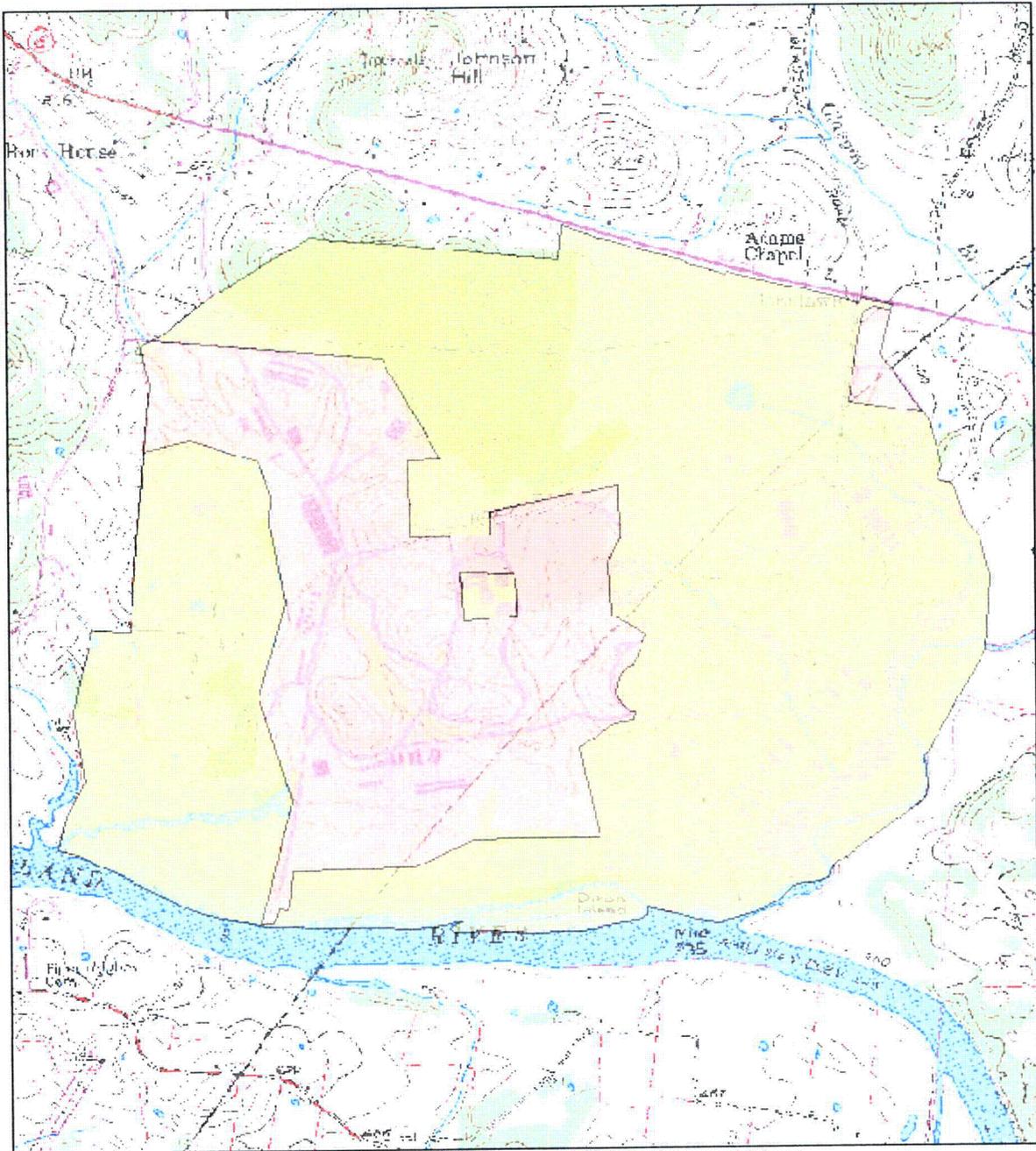
Hartsville Site Aerial Photos (3 at increasing scale)—TVA internal web site, Maps & Photos



**Hartsville Site 6-Mile Vicinity**

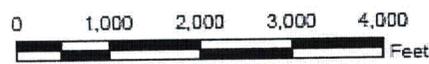
-  Transmission ROW
-  State Highways
-  Hartsville Site Boundary
-  Reservoir





### Hartsville Site Land Ownership Status

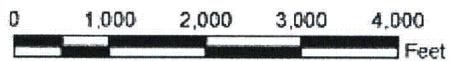
- Retained (1377 acres)
- Sold (554 acres)

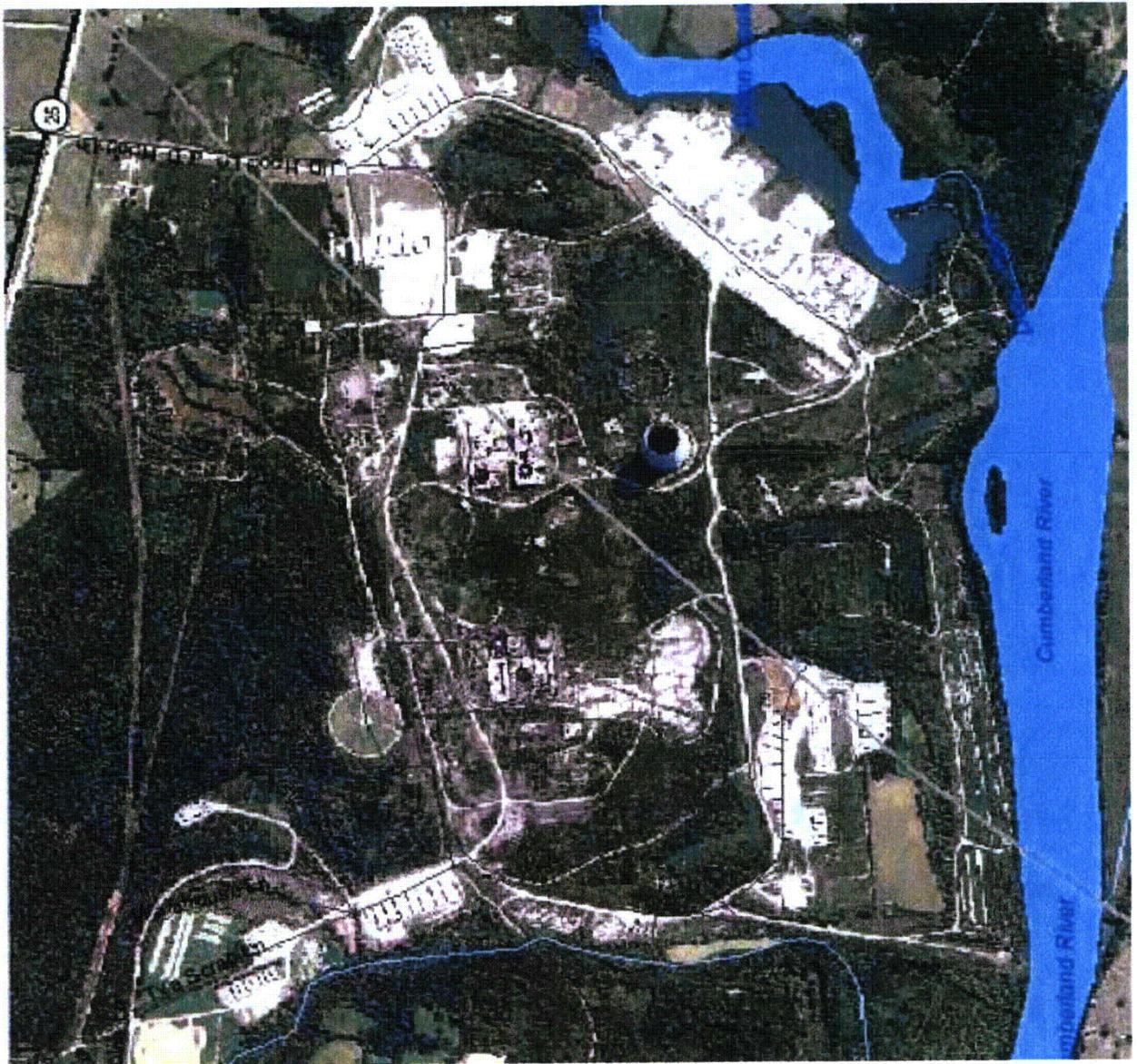




### Hartsville Site

- Transmission ROW
- Site Boundary





**Aerial Photo, Hartsville Nuclear Site**



**Aerial Photo, Hartsville Nuclear Site**



**Aerial Photo, Hartsville Nuclear Site**