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7 Site Selection

In almost military fashion, the Du Pont organization developed its approach to the new project. Robert M. Evans, William Mackey, and Lombard Squires of Du Pont's Explosives Department came to Washington on June 15, 1950, to learn about the project in front of them and to initiate their technical survey of the AEC's plans. Another Du Pont sortie of a different nature was already in the making. The search was on for possible sites for the new production facility.[1]

SITE-SELECTION PROCESS FROM OAK RIDGE TO IDAHO

The majority of the nation's weapons production complex was constructed in two waves, in 1942–1944 and 1947–1953. The criteria developed for the selection of Oak Ridge and Hanford during the Manhattan Project were inherited by the AEC for their 1947–1953 expansion, then refined as the agency's knowledge of reactor technology advanced. Individuals involved with the expansions learned from each project, honing their skills at site selection and compiling basic criteria needed for construction. Among them, they possessed a rich corporate memory.[2] Those involved with choosing the future Savannah River Site were participants in creating this corporate memory.

Three military terms were used to define the considerations involved in determining basic criteria. "Strategic" concerns were broad in nature and related to national military and economic potential, defending the facility from enemy attack, and the proposed facility's relationship to other facilities within the production system. "Operational" considerations referred to an area's terrain, population, and resources that had to fit the proposed plant's requirements. "Tactical" considerations included local housing availability and transportation links, and were often the basis for a secondary set of criteria applied in the later stages of decision making.[3]

OAK RIDGE SITE

In his first act after assuming control of the Manhattan Project, General Leslie Groves selected the Oak Ridge site in 1942. Until that time, site acquisition for Oak Ridge had not progressed under the Office of Scientific Research and Development (OSRD).

Tennessee was chosen as the general site area for its ample supply of electrical power; wartime had made electricity a strategic concern. It also was a good geographic fit with the War Department's policy, established for the defense munitions industry to site plants between the Appalachians and the Rockies and no closer than 200 miles to the Canadian and Mexican borders. The OSRD concurred with this strategy. Planners agreed only on preliminary criteria, based on best practices in engineering, and their sketchy knowledge of what would be needed by an atomic production facility. This included isolation from population centers, terrain broken by ridges that would act as natural barricades, access to water, and a strong power supply. A 200-square-mile federal reservation was needed to safely enclose the processes under development. Initially, all production units were to be at one site, for secrecy and to facilitate construction and operations. Stone and Webster, the proposed construction firm, added construction concerns to these basic criteria. The sticking point was the 200-square-mile requirement set by the OSRD for the reactor exclusion area. While this requirement delayed action on the part of Colonel James C. Marshall of OSRD, his successor, Leslie Groves, acted immediately, claiming a bad decision was better than no decision.

HANFORD SITE

Du Pont objected to the idea of locating the reactors, then called "plutonium production piles," at Oak Ridge. The proposed exclusion area was not sufficient and if a "premature criticality" of plutonium resulted in an explosion, Knoxville could be threatened. Preferring not to interrupt ongoing construction at the Tennessee facility and reluctant to slow the project by acquiring more land, Groves agreed to find a new site for the reactor complex.

Du Pont and Manhattan Project personnel developed basic criteria for reactor siting at a meeting held on December 14, 1942—the first systematic attempt to match technical reactor requirements to engineering and safety considerations.[4] The Metallurgical Laboratory in Chicago generated operational requirements, and Du Pont, in concert with Groves' staff, responded to these, to develop criteria to assure operational safety while meeting production goals.

They recommended taking enough land for six reactor areas, separated from each other by not less than a mile, and four "secondary areas" for the even more hazardous separation plants, to be spaced not less than four miles from each other and the reactors. Six reactor areas would be more than needed for the number of reactors then planned (two). This decision made good sense from the strategic standpoint, but it complicated the operational task of finding a site isolated enough where all six reactors could be operated at full power without endangering the adjoining population. The reactor engineers recommended evacuating a 10-mile wide "exclusion area" around the "manufacturing area." A 10-mile complex would require an "exclusion area" of about 700 square miles. And beyond it the engineers suggested prohibiting residential occupancy in an area of 44 by 48 miles—more than 2,100 square miles. There could be no major public roads or railroads within the 700-square-mile reservation. There could be no towns with more than 1,000 population closer than 20 miles.[5]

The primary requisites included abundant electric power and the availability of pure cold water, flowing through the area at 25,000 gallons a minute. Secondary criteria included level land for building, mild climate for construction and operation ease, and access to coal and oil. There was one final criterion; the creation of the site should displace as few individuals as possible. The Corps of Engineers was then called upon to find a site that best fit these requirements, and a 670-square-mile circular tract in Benton, Yakima, Grant, Adams, and Franklin counties in Washington State was chosen for development into the Hanford Engineer Works. Du Pont built and operated the facility until 1946. General Electric operated the Washington State facility during the second expansion.

POCATELLO SITE

In 1947, the AEC began investigating the feasibility of constructing two new reactors at a site other than Hanford for "strategic insurance." The Army encouraged the selection of a new site from a defensive perspective, as the Pacific Northwest was now vulnerable to Soviet long-range bombing. The projected high costs and implications for the labor force within the young complex were daunting, however, and the idea was put aside. By early 1948, the Cold War changed minds, and the AEC's Production Division drafted a list of ten potential sites. The Reactor Safeguard Committee created a formula for large production facilities in which the radius of the totally evacuated "exclusion zone" was to be directly proportional to the thermal power output of the reactors ($r = 0.01\sqrt{P}$, where r = exclusion radius miles and P = thermal power kilowatts).

The Commission was at this time siting its new experimental reactors, which were becoming more powerful and simultaneously more dangerous to have near population centers. A remote reactor proving ground was needed, and site selection began based upon the older criteria and the list of ten sites drawn up in 1948. The selection process was poorly handled from the start, involving confusion over the project's scope, an incorrect disclosure to a state politician, the rewriting of site criteria during the selection process, and the replacement of the lead site at the last minute.

A congressional hearing was held in April and May 1949 to investigate the many problems involved. Pocatello was selected in March 1949; the acquisition process was completed when the Arco Naval Proving Ground was transferred to the AEC late in the year. The lessons learned in siting the new facility, the Idaho Reactor Testing Station, were immediately put to use in 1950 when the new production facility site was under study.

LOOKING SOUTHWARD

When AEC Commissioner Sumner T. Pike negotiated with the Du Pont Company to undertake the construction of the new reactor project, he made it clear that the firm was to be responsible for all phases of the project, including site selection. In progress reports to the JCAE about the site-selection process, Commission chairman Gordon Dean emphasized to the congressional committee that Du Pont had the decision-making power over the location of the new site. He tempered this in more public documents, referring to recom-

mendations that would be submitted by Du Pont for review by a government site-review committee. This difference in emphasis may reflect a concern over how the site-selection process would be viewed by the press and public who, in the 1950s, had become part of the process.[6]

Strategic concerns, such as the number of reactors and separation facilities to be constructed, would determine the size of the new reservation. Du Pont and the AEC would settle these issues as the scope of work developed. However, defense issues were paramount in the site-selection process, with the Military Liaison Committee drawing up a map of defense zones for the AEC's Production Division. The preferred zone for the new complex, the First Defense Zone, stretched across the South to central Texas and north to Virginia and the lower Midwest. A 100-mile strip along the coast was excluded, along with all of Florida. Two other zones, the Second and Third Defense Zones, were shown; however, both were vulnerable to Soviet bombers from Siberia. The "Northeast Industrial Triangle" was to be avoided by specific request of the Department of Defense; it would make the new complex even more enticing as a target for Soviet bombing should the complex be located there.

A major departure from earlier site-selection procedures was the exclusion of a "government town" from the scope. Previously, worker's towns, known as atomic cities, were incorporated into the atomic energy reservations for secrecy and for public safety. The three atomic cities of Oak Ridge, Richland, and Los Alamos, were owned in their entirety and administered by the Commission.

> Everything from cemeteries and sidewalks to homes and grocery stores was Government property. In 1947 Oak Ridge and Los Alamos were still closed communities surrounded by patrolled security barriers. Even relatives of residents could not enter without a pass. Behind the fences the scientists, engineers, technicians, and laborers who manned the production plants and laboratories lived with their families in an isolated world of their own. The Army and then the Commission, through local management contractors, operated the bus systems, collected rents, delivered coal, repaired homes, manned the fire departments, operated the movie theaters, leased stores, and ran the schools.[7]

The communities were an unwelcome legacy for the AEC, which began to seek ways to divest themselves of the problems inherent in managing community life. The Commission looked to the National Housing Agency for help in charting a future course for these communities, and began planning ways for the towns to incorporate, and for the residents to own their homes and commercial enterprises and to begin to manage their community life. Hewlett and Anderson point out that beyond these practical matters there also important policy considerations before the Commissioners in January 1950. While self-government and free enterprise appeared to be the way to go, the Commission could not let these aims interfere with the primary purpose of these communities. The towns existed because they supported the Commission activities. However, the Commission could not guarantee the operation of any production facility over time. Changing missions and plant obsolescence could lead to financial doom for a one-industry town.[8]

A solution was reached for the new production facility that would avoid these issues. The construction of a government town was simply eliminated from the project scope. Instead, the Commission asked Du Pont to look aggressively for areas that could absorb the new operations staff within established communities. Driving the point home, AEC Commissioner Sumner T. Pike warned that should Du Pont site the new complex in an area that could not support the operations staff, then Du Pont would assume responsibility for the construction and administration of such a community.[9]

The defense considerations and the housing requirement made the South a leading candidate for the complex. Federal dollars and large industrial complexes were welcome, and word that the South was under consideration spurred trips to Washington in search of favor. Truman's office received enough visits that he advised AEC's Gordon Dean not to brook any political pressure in the decision making process.[10] While Truman's words underscored that a location should be chosen on its own merits, the new parameters—that an existing community infrastructure be in place within the preferred defense zone—would not fully erase such pressures for the site survey team.

PROGRESSIVE ELIMINATION

On June 19, after discussion with Du Pont, the Commission's Production Division sent preliminary criteria to the Office of the Chief of the Corps of Engineers. These criteria would be later expanded, as process development was concurrent with the site-selection process. The Corps was first asked to identify any government-owned reserves that were between 100 and 150 thousand acres (approximately 350 square miles) within the preferred zone of defense that could be considered isolated, but also was within 15 miles of a neighboring community with a population of 25,000 to 50,000 individuals. Sufficient water and transportation links were also initial considerations.

The site survey team, composed of two Du Pont men and an AEC representative, then further consulted with the Corps of Engineers on all potential areas within the Corps' Ohio River, South Atlantic, and Southwestern Divisions, an area that roughly corresponded to the preferred defense zone. The Commission had clearly stated that all sites with potential should be investigated to avoid problems that had cropped up on earlier site selections, notably with the Pocatello site. The Corps of Engineers recommended nearly 100 areas that had potential, at least on paper.

The AEC Production Division then requested that the Corps provide detailed information on all of them, keeping tight scrutiny over the selection process. Changing plant requirements suggested that sites outside the preferred region should be considered based on the need for cold water and lower wet-bulb temperatures. The territory for the search was thus expanded and, by mid-August, profiles of 105 potential sites had reached Washington. These were duly sent to Du Pont for review.

Over time, the chemical firm had developed a meticulous procedure for selecting its commercial plant sites. This method, expanded to fit the search for the new AEC production site, allowed Du Pont to hit the ground running once the basic criteria had been defined. At its heart, the Du Pont site-selection procedure involved the "systematic investigation of significant factors and the correct evaluation of their importance." Through a logical progression of six steps, undesirable sites were eliminated, acceptable sites were

further evaluated, and the most appropriate site that filled the selection criteria was chosen.[11]

1 - Basic data
2 - Preferred region
3 - Office study
4 - Preliminary field inspection
5 - Preliminary selection and optioning
6 - Evaluation for final selection.

The documentary record shows that Du Pont assiduously followed each step in the site-selection process for the new production facility, which was identified as Plant 124 in Du Pont reports and memorandums that date to the summer of 1950. Charles H. Topping, a scholarly looking man with a neat mustache who would become Du Pont's principal architect and civil engineer in 1954, was responsible for the search for Plant 124's location.

Topping was a New York native who received his degree in civil engineering from Massachusetts Institute of Technology in 1928. After school, he worked overseas first in Venezuela's oil fields, then in Persia as a superintendent of construction for the South Persia State Railways, the rail system that later carried American war supplies to Russia. While in Persia, he also worked as surveyor for a University of Pennsylvania archaeological expedition. When he returned to the states in the mid-1930s, he worked first in New York, then in Texas, where he designed oil refinery structures and Houston's municipal water facilities. He accepted a job as a civil engineer with Du Pont's Design Division in 1942. Like others on the staff, he became part of Du Pont's Hanford team, working on that facility and other wartime industrial plants.[12] In 1955, at the Nuclear Engineering and Science Congress held in Cleveland, he gave a professional presentation on the expanded use of the Du Pont method of selecting chemical-plant sites for the reactor production site. His paper gives an insider's look at the way the massive search was conducted.

Charles H. Topping, Du Pont's principal architect and civil engineer, was responsible for the "plant survey." Topping gave a professional presentation in 1955 at the Nuclear Engineering and Science Congress in Chicago on the application of Du Pont's chemical plant selection process to the selection of the new production facility for the AEC. Source: *SRP News and Views*, October 22, 1954.

The basic data developed by the AEC and Du Pont were organized into six categories: water, wastes, labor, isolation, acreage, and power. Data were assembled from the Corps of Engineers, branches of the Department of the Interior, and Du Pont. In some categories, the survey team devised calculations or formulae that would allow for comparison between sites. For example, a formula was created that would simultaneously fulfill the isolation requirement while identifying a supporting population and civic infrastructure. The preferred region within which to locate the site, about 25 percent of the continental United States, had already been selected by the AEC under guidance from the Department of Defense.

With this data in hand, the "office study" step commenced. The team plotted "basic data" on the Strategic Map of the Corps of Engineers, locating all potentially acceptable sites within the preferred region and eliminating unsuitable sites. Military requirements specified the automatic elimination of certain areas surrounding specific cities and installations.[13]

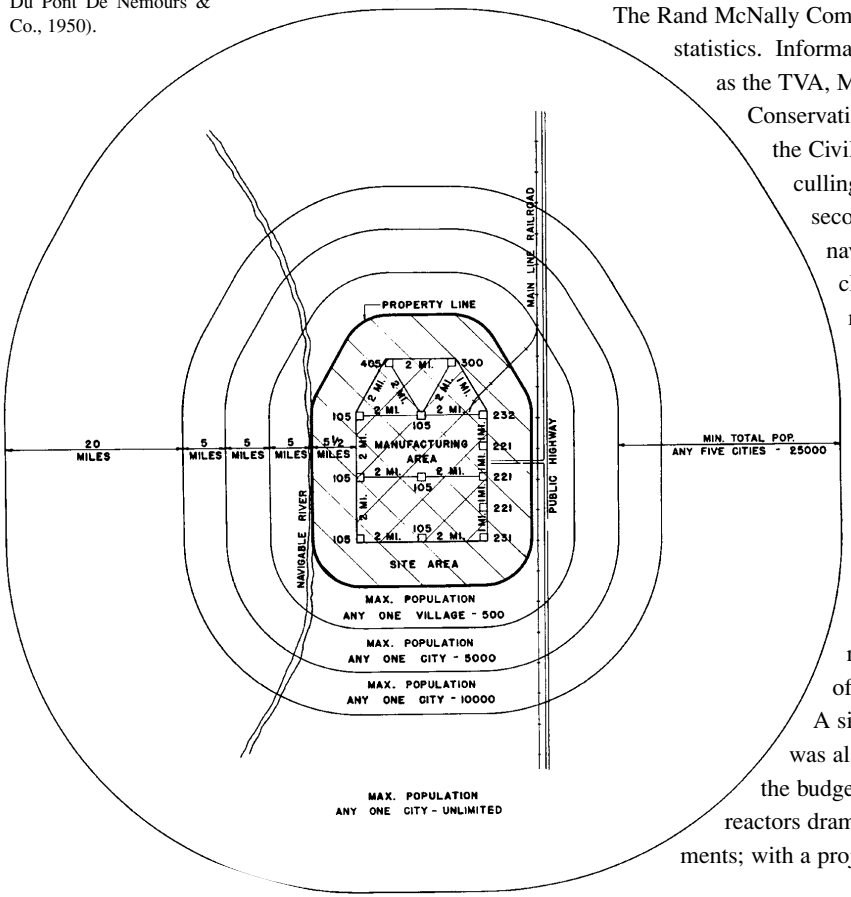
> Water supply was again the first factor used to find all possible acceptable areas and eliminate unusable areas. The economic limit for pumping the required large quantity of water was judged

to be less than 20 miles. Consequently, we were able to limit the area searched to a 20-mile-wide band on either side of rivers or bodies of water from which the required amount could be safely obtained. These strips were plotted on the Strategic Map of the Corps of Engineers. The population of all communities in the neighborhood of these strips was also entered on the map.

[A diagram] was drawn to scale on transparent plastic. It was laid on a map with the plant area falling within the previously mentioned 20-mile-wide strips on either side of the rivers or lakes. Where the population spacing and acreage requirements shown on the diagram could be fitted into the data on the map, that area was marked for further study. This rapid method positively located every potentially acceptable area and eliminated relatively large unusable areas from further consideration.[14]

The First Defense Zone yielded 114 general areas within 20 miles of a firm source of 200-cubic-feet-per-second (20 cfs) of surface water, with the required supporting population and required isolation from cities, installations, and population centers of more that 5,000 people. This number was reduced to 84 specific sites by the application of isolation criteria for all communities shown on the U.S. Corps of Engineers Strategic Map. The Rand McNally Commercial Atlas of 1950 was used for population statistics. Information on maps from the Army and agencies such as the TVA, Mississippi River Commission, State Conservation Departments, Department of Agriculture, and the Civil Aeronautics Authority was also reviewed. The culling process continued when Du Pont applied the secondary criteria of terrain, freedom from floods, navigable streams through the site, accessibility, climate, pumping lift, and pumping distance. The number of potential sites was reduced to 17. Three local sites made it to this shortlist—two in South Carolina and one in Georgia.

In order to apply the basic criteria at each candidate site consistently, Du Pont's engineers formulated a template for use that highlighted each concern from transportation to safely dispersing manufacturing units. In the "Diagrammatic Outline of Certain Basic Criteria: Used for Determination of Manufacturing Area, Purchased Property, Population Support and Isolation," No. 105 represents a reactor, Nos. 221, 231, and 232 refer to separations facilities, No. 300 refers to a metal fabrication facility, and No. 405 was used to refer to a technical testing facility. When Topping was conducting the survey, six reactors were under consideration as well as three separations units. The sixth reactor and third separation unit were later dropped from Du Pont's scope of work. Source: Charles Topping, *Plant 124–Site Survey*. (Wilmington: E. I. Du Pont De Nemours & Co., 1950).



CHANGING THE BASIC CRITERIA

In June 1950, the North Korean Army drove across the 38th parallel into the Republic of Korea. In response, the AEC added three more heavy-water reactors to the Du Pont scope of work, bringing the total to five for the new site. A sixth, a power-producing heavy-water reactor, was also initially planned, but was later dropped from the budget in November 1952.[15] The addition of these reactors dramatically changed the previous water require-

ments increased from 200 cfs to 600 cfs. Du Pont's engineers eliminated ten sites on that basis and then two more on late-arriving secondary criteria information. Five sites within the First Defense Zone made it through the "office study" step; two in South Carolina, two in Texas, and a fifth in Oklahoma.[16] However, the leading candidate among this group was "South Carolina No. 5, 22 miles southeast of Augusta, Georgia" on the Savannah River.[17]

Basic Site Requirements

Manufacturing Area - Potential sites were first screened on the basis of a one-mile-square manufacturing area with topography suitable for building. Final consideration was on the basis of at least twelve separate plant locations, each with topography suitable for the construction of the main manufacturing buildings and their attendant service buildings. Six reactor locations and one test-reactor location must be spaced approximately two miles apart. Five separation plant locations must be spaced approximately one mile apart. There must be approximately a two-mile spacing between a reactor and any other plant.

Site Area - The site area will include not only the manufacturing area proper, but also a 5.5-mile-wide zone outside the critical manufacturing area as defined above. (Since this criterion was set, power levels of reactors greater by some 25 percent appear feasible so that a 6-mile zone is more desirable.) All inhabitants or personnel not connected with the plant must be evacuated from the total site area.

Supporting Population - There should be a minimum distance of 20.5 and a maximum of 40 air miles from the edge of the manufacturing area to the center of a population of 25,000 individuals. Smaller communities of 5,000 individuals up to a total of 25,000 individuals were an acceptable equivalent.

Isolation - The size of communities and distances from the edge of the manufacturing area shall be limited as follows:

Circular area 5.5–10.5 miles:	maximum 500 persons
Circular area 10.5–15.5 miles:	maximum 5,000 persons
Circular area 15.5–20.5 miles:	maximum 10,000 persons

Water - The source of water should be ample to furnish the following quantities without damage to other presently established users.

Water Requirements in Cubic Feet per Second (cfs) for Six Reactors

Method of Cooling	Once-Through	Cooling Tower
Withdrawal for Plant	600	150
" Electric Power Generation	0	30
Total	600	180
Consumptive Use – Plant	50	50
" Electric Power Generation	0	15
Total	50	65

Electric Power - 125,000 kilowatts was considered desirable for use in six reactors. Uninterrupted power supply is of utmost importance to operation in all manufacturing areas.

Railroad - The site must be accessible by railroad.

Highways - The site must be accessible by highway.

Meteorology - The possibility must be recognized that radioactive gases may be discharged to the atmosphere, and situations can be visualized whereby a large cloud of active materials could be discharged. Consequently, a favorable site would be one where the prevailing wind velocity is above 3 miles per hour and the prevailing wind direction, if any, is away from centers of population closer than 20 miles. Sites with high frequency of fog and severe sleet conditions, extended seasons of snow cover if close to a center of population, or low frequency of sunshine would be undesirable. Climate in general should be as favorable as possible for plant construction and operation, and wet-bulb temperatures should not exceed 75 degrees F during more that 2.5% of the summer hours if cooling towers are to be used.

Geology - The geological substructure and overburden should be stable. The area should have a low earthquake record and probability. Allowable bearing for foundation loads of 12,000 psf or lb/ft2 may be required. It is desirable but not essential that the top strata be relatively impermeable to prevent contamination of groundwater or public water supply in the event of accidental discharge of radioactive wastes. About 1.5 million cubic yards of concrete and road aggregate will be required. This material should be obtainable nearby.

Construction and Operating Costs - The site should have characteristics, which will assure economy consistent with other requirements for satisfactory operation.

Source: Charles Topping, *Plant 124–Site Survey*. (Wilmington: E. I. Du Pont De Nemours & Co.,1950), 1–3.

In October, the "preferred region" changed based on the possibility that savings could accrue from using colder water to cool the reactors. Du Pont recommended that a search be made within the Second Defense Zone and in neighboring areas. Topping notes that the extended search used the same methodology, but was limited to likely sources of cold surface water or ground water from aquifers replenished by large streams. Thus the shores of lakes Superior, Michigan, Huron, and St. Clair were considered, as well as areas along the Missouri, Mississippi, St. Croix, and Wabash rivers. The North Platte and Arkansas rivers were also evaluated. Six "cold-water sites" survived the office study step.

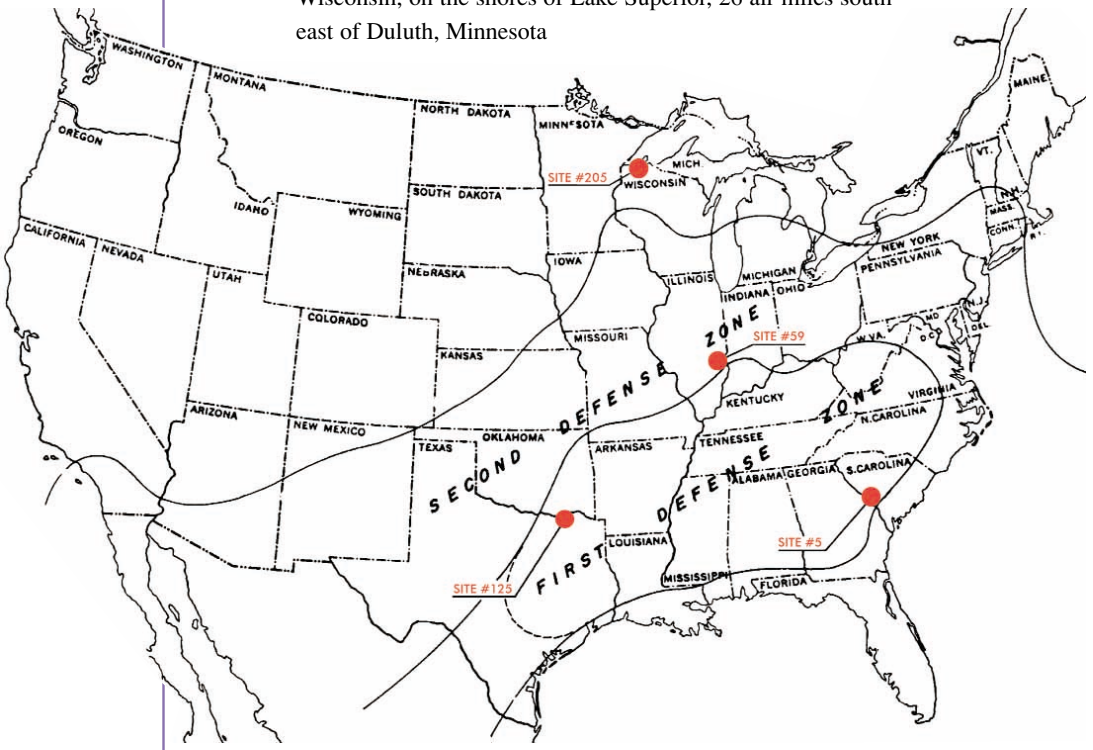
Personnel from the AEC, the Corps of Engineers, and Du Pont conducted preliminary field inspections of eleven sites and eliminated nine. The final candidates were reduced to four, two within the First Defense Zone, one with moderately cold water temperature in the Second Defense Zone, and a fourth adjacent to the Second Defense Zone.

Site Number 5 – Located in Aiken and Barnwell counties in South Carolina on the Savannah River, 20 air miles southeast of Augusta, Georgia, and 15 air miles south of Aiken, South Carolina

Site Number 125 – Located in Fannin and Lamar counties in Texas and Bryan and Choctaw counties in Oklahoma on the Red River, 15 air miles east of Bonham, Texas, and 76 air miles northeast of Dallas, Texas

Site Number 59 – Located in Crawford and Clark counties in Illinois and Sullivan County in Indiana on the Wabash River, 20 air miles southeast of Terre Haute, Indiana

Site Number 205 – Located in Bayfield and Douglas counties in Wisconsin, on the shores of Lake Superior, 26 air miles south east of Duluth, Minnesota



This illustration was used in *Plant 124–Site Survey Report* to show the location of the final four candidate sites and their relationship to the preferred military defense zones. Strategically, the preferred zone for the new complex was the First Defense Zone that was least vulnerable to Soviet bombers. Site No. 5 in South Carolina became the Savannah River Plant. Source: Charles Topping, *Plant 124–Site Survey*. (Wilmington: E. I. Du Pont De Nemours & Co., 1950).

At this juncture, an overview committee was brought in to review the work to date. The Commission had created a Site Review Board for this purpose in August. The board was headed by General L. J. Sverdrup, an Army Engineer in the Pacific Theater in World War II and later head of the engineering consulting firm of Sverdrup and Parcel, Inc. of St. Louis, Missouri. Other members included: A.T. Waidelich, vice-president of The Austin Company of Cleveland, Ohio; H. L. Bunce Jr., vice-president of Stone and Webster Engineering Corporation of Boston, Massachusetts; James F. Towers of Ford, Bacon, and Davis, Inc. of New York City; and, finally, W. S. Finlay, executive vice president of J.G. White Engineering Corporation of New York City.[18] Considered national experts in site selection, the committee reviewed the selection procedures to date and gave their go-ahead for the final selection process.

Du Pont's survey technical advisors conducted a field inspection of Site No. 5 by land, air, and boat in October 1950. A lifejacketed and capped Robert Mason, future Field Project Manager for the Savannah River Plant, is in the center standing on a Savannah River dock. The other men in the photograph may be Andrew McCullin and George Dutcher who were also part of the Du Pont team. Courtesy of the Mason Family.

FINAL SELECTION

G. P. Church, J. A. Burns, W. C. Kay, and J. B. Tinker of Du Pont visited the First Defense Zone sites between August 29 and September 1. In almost checklist fashion they ran through the many considerations involved, citing when each site had the "edge" over the other. South Carolina's No. 5 had a construction advantage, while the Texas site was considered to have better population support. The availability of skilled labor was scarce at both venues and the report notes that the South Carolina population, both white and African-American, was rural and lacking in industrial experience. The Texas site was composed of more productive and fertile land than its South Carolina counterpart, whose land was described as marginal. The bottom line stressed by the survey was that both sites met the general criteria upon which the site survey was based.[19]

A second round of study and evaluation began in which the four sites were vigorously reevaluated. In addition to the physical comparisons drawn from the field surveys, economic comparisons were made based on an arbitrary plant design. The team worked diligently, almost like devil's advocates, to show what advantages or disadvantages each site possessed in comparison to the others. The study of cost differentials, with the assumption of a fixed reactor design and an average productivity, did not elicit any clear-cut winners.

For waste disposal and contamination, the Savannah River location appeared to be the most desirable for "normal operation or catastrophe." The high percolation rate of the area's soils could facilitate locating and correcting an unintentional spill. Also, the only public water intakes were 160 miles downstream, a distance thought sufficient to dissipate any possible contamination.

The four candidate sites were considered comparable in terms of population support, with operating labor and housing conditions judged inadequate at all four sites. However it was perceived that the Savannah River communities could better absorb the impact of the project. Community data was collected and presented in tabular form noting populations, housing and transportation services available, and numbers of hotels, banks, schools, and hospitals. Savannah River was estimated to have the lowest construction labor rate, best met the isolation criteria, and was composed of lands that were not extensively cultivated in food crops.

Other favorable attributes included good topography with easily accessible rail and highway links, no bridges needed to be constructed, little clearing was needed, and the land needed for the manufacturing core was well above the maximum flood level. The Savannah River had a seven-foot-deep navigable channel, making delivery of materials by barge or boat possible. Some subsoil testing was undertaken, and exploratory drilling conducted in September showed that some corrective measures needed to be taken. However, the costs involved would be offset by the better excavation and drainage conditions the site offered. Climate and the frequency of natural disasters such as earthquakes, hurricanes, and tornadoes were considered.

A second field inspection of the South Carolina site occurred on October 17. The South Atlantic Division, under orders of Colonel A. G. Kirchoff, provided military aircraft for an aerial inspection. H. A. Robinson of the Corps and George Dutcher, Andrew McCullin, and Robert Mason from Du Pont were invited as technical advisors. Mason summarized the three-day "close field investigation of Site 5 by land, air, and by boat in a report titled *Plant Investigation—Project 8980, Site #5*.[20] Oral interviews with descendants of the survey crew note that the work was done in secrecy with participants using assumed names for work done prior to the site selection.[21]

The technical advisors, who were in Du Pont's Construction and Design Division, tentatively identified twelve sites as building areas. A heavy-water production area (400 Area), five chemical separations and fabrication facilities (200 areas), and six reactor areas (100 areas) were marked on a map and photographed. This number and types of proposed building areas clearly shows that Du Pont was working with preliminary data at this juncture.

Area A - 400 Area (Building 405)
Area B - 200 Area (Building 221)
Area C - 200 Area (Building 221)
Area D - 200 Area (Building 231)
Area E - 200 Area (Building 221)
Area F - 200 Area (Building 232)
Area G - 100 Area (Building 105)
Area H - 100 Area (Building 105)
Area J - 100 Area (Building 105)
Area K - 100 Area (Building 105)
Area L - 100 Area (Building 105)
Area M - 100 Area (Building 105)

No identification was made for a 300 area because Mason felt there was sufficient area that it could be located with ease. A temporary construction area and camp could be set up two miles west of Dunbarton on the north side of then State Road 64. A plant siding was also tentatively located. In general, the proposed manufacturing area looked very acceptable from a construction standpoint.

The survey team flew from Bush Field to Clarks Hill Dam, then to the proposed site area. The detour to Clarks Hill was to inspect progress on the project, which had eight months of work left until completion, according to Robinson. The presence of a completed Clarks Hill Project was initially considered a major factor in the selection process, and

What's Coming?

In the fall of 1950, an air of excitement pervaded the sleepy little town of Ellenton nestled contentedly in South Carolina's historical lowlands near the Savannah River. For several months its easygoing folk had noticed unusual events happening in and around their community; and they knew they were significant: Why were boring crews circulating the town? Why were soil samples needed? Why were strangers continually coming and going? Since no one seemed to understand these mysterious missions, speculations flew over the community like migrant birds. The most likely conclusions were: either oil had been discovered or useful materials found in the soil.

But regardless of what might come, the people would welcome it to spur their lagging economy and increase the population. Since this agricultural community had few natural resources to attract newcomers, it suffered from a stunted growth. And even though industry was slowly moving in, it wasn't sufficient to give the impetus needed for the progress the people longed for. Now after all these years Ellenton was fast becoming a nonagenarian; the population had barely reached a thousand. So, like excited and impatient children waiting for Santa on Christmas Eve, the people waited for developments.

Quoted from Louise Cassels, T*he Unexpected Exodus*, (Aiken, SC: Sand Hill Press, 1971), 1.

there is no doubt that Lester Moody, Augusta's Chamber of Commerce secretary, and Barnwell's Edgar Brown were consulted. The possibility of the atomic energy plant would help fuel the completion of the dam, much to their liking. The survey team also toured the area by boat, looking at soil types, and exploring the extent of the swamp along the river, to investigate the need for cofferdams for the pumphouses and to assess the principal drainages.

From the tone of Robert Mason's conclusions, it appears that Site 5 was the leading candidate. After pointing out the site's many physical advantages from a construction man's perspective, he noted that the low pay scales (the average in Atlanta was then $1.95 per hour) would make it difficult to attract the number of experienced mechanics needed for the job. In pragmatic terms he also advised that racial discrimination could be a problem at the South Carolina site. Du Pont had already faced the segregation issue by constructing and operating its private Orlon plant near Camden, South Carolina, in 1950. The documentary record suggests that Du Pont was already considering how to uphold the nation's law while working within a milieu that did not. Unlike their Camden plant, the new plant was a federal project. Mason astutely noted how the other large federal property in the site area was handling segregation. "A check of Camp Gordon reveals that within the reservation the Military practice is no segregation; however, on bus lines leaving the reservation, there prevails the practice of segregation. On a project such as we expect to construct, it appears that the no-segregation law would be impractical to administer."[22] Later studies show that Du Pont explored this issue at the state's other federal reservations, seeking information not only on the "official" policy but also on how that policy was actually implemented. Notably, race would not surface in subsequent reports as an issue.

SOUTH CAROLINA SITE NO. 5

The recommended site was located in South Carolina's western Aiken and Barnwell counties, situated within two subdivisions of the Atlantic Coastal plain: the Aiken Plateau and the Alluvial terraces that lie along the river. Eighty percent of the site was situated within the Aiken Plateau, where elevations ranged between 300 and 385 feet. The terraces were composed of three tiers of varying widths banding the river. From north to south, six streams dissected the tract: Upper Three Runs Creek, Four Mile Creek, Pen Branch Creek, Steel Creek, Hattie Creek, and Lower Three Runs Creek. Five streams emptied into the river in a southwesterly direction; the sixth, Lower Three Runs, flowed to the southeast and drained the eastern portion of the proposed site.

Reconnaissance of the proposed site by the Site Survey Committee revealed its agricultural economy, and community data gathered during the site-selection process underscored that fact. Sixty-seven percent of the proposed site's acreage was wooded, while thirty-three percent was either cultivated or used for pasture. Corn, grains, cotton, and peanuts were grown along with watermelon, soybeans, seed lupine, and grain sorghum. The farm operations encountered ranged from one-mule tracts to machine-operated multi-tractor farms. Small farms predominated, with larger farms operating on a sharecrop or tenant basis. Appraisers would later verify what Du Pont saw from its field inspections, that most of the farms were tenant-operated and the majority of the agricultural work force was African-American.

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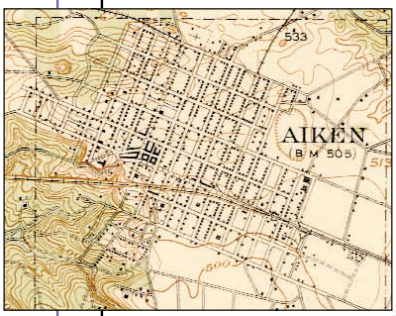
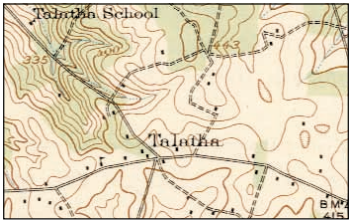
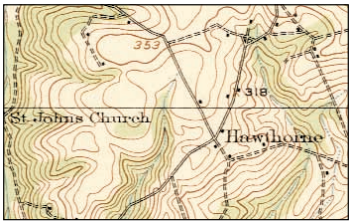


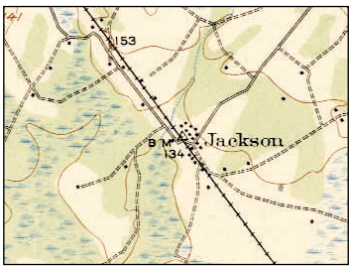
AIKEN, 1919
USGS Quadrangle Aiken, S.C., 1921.



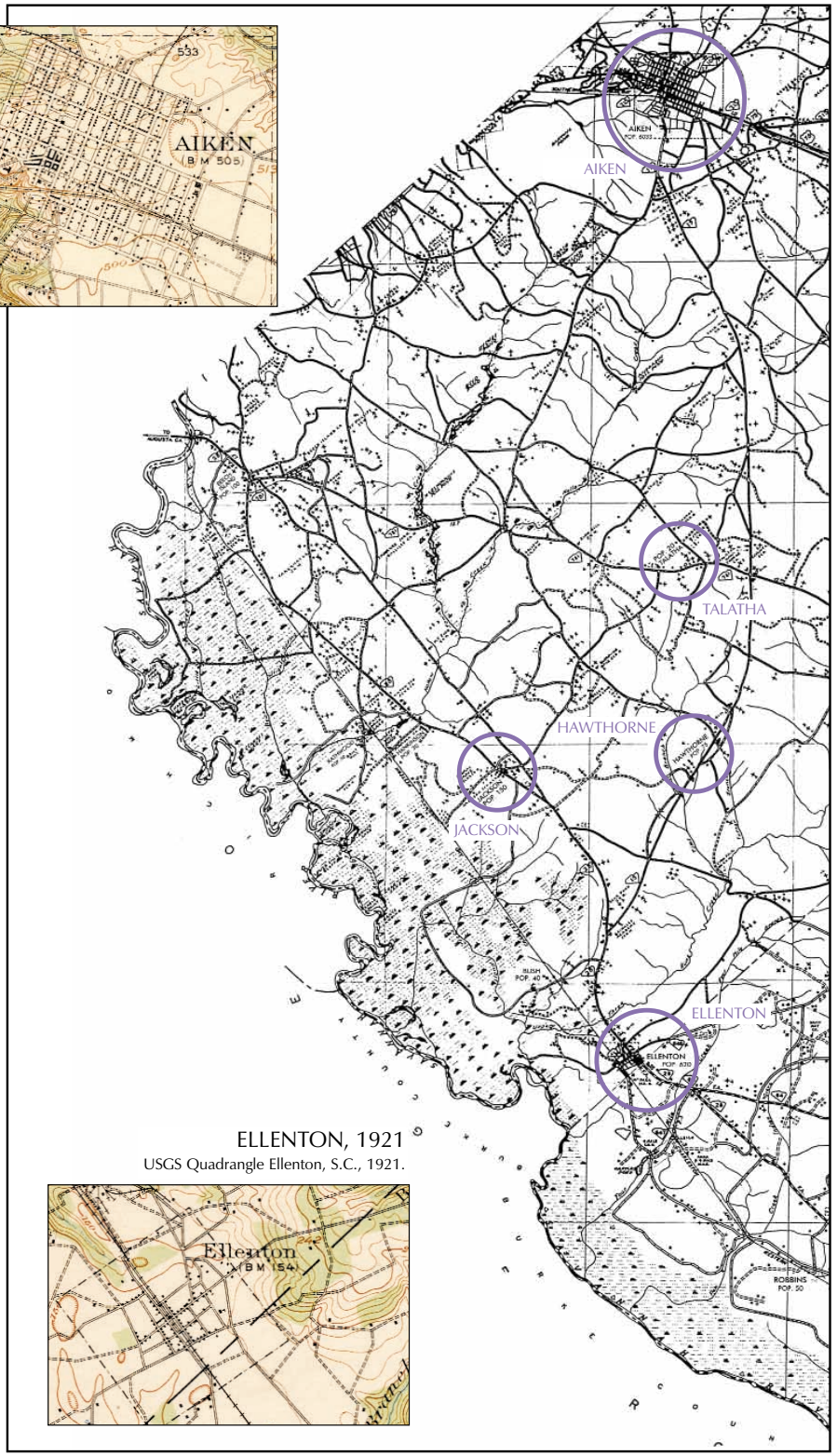
TALATHA, 1921
USGS Quadrangle Talatha, S.C., 1921.



HAWTHORNE, 1921
USGS Quadrangle Talatha, S.C., 1921.

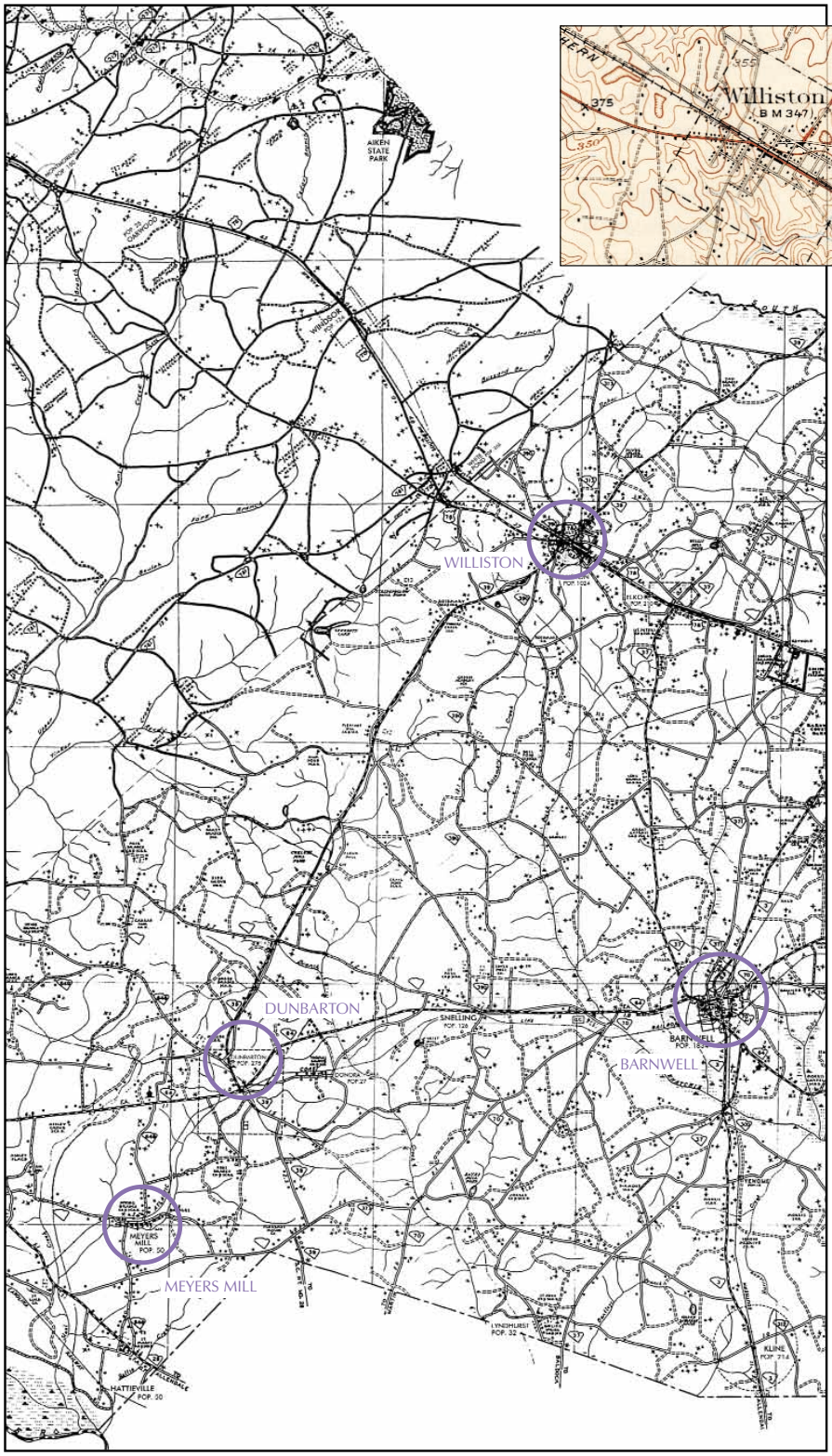


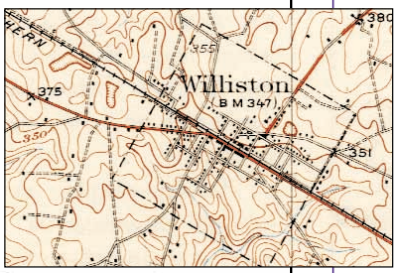
JACKSON, 1921
USGS Quadrangle Augusta, S.C.-GA., 1921.



ELLENTON, 1921
USGS Quadrangle Ellenton, S.C., 1921.

Savannah River Site Area and Environs. Compiled Map of Site Area Showing Communities, 1939. Base Source: Barnwell County Highway Map and Aiken County Highway Map, 1939. Courtesy of University of South Carolina, Cooper Library, Columbia, SC.

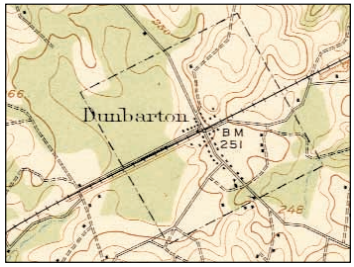




WILLISTON, 1927
USGS Quadrangle Williston, S.C., 1927.

Source: USGS Topographic maps from 1919, 1921, and 1927 are courtesy of New South Associates, Stone Mountain, GA.

BARNWELL, 1919
USGS Quadrangle Allendale, S.C., 1919.



DUNBARTON, 1921
USGS Quadrangle Ellenton, S.C., 1921.

MEYERS MILL, 1921
USGS Quadrangle Ellenton, S.C., 1921.

Community statistics were gathered for each candidate site that contained necessary data on the availability of housing, schools, medical facilities, infrastructure, as well as the presence of cultural and religious advantages. The assessment of available housing if Site 5 was to be selected was of primary importance. When this data was gathered only Barnwell, Aiken, Allendale and Augusta had available housing.

The proposed site was rural but not isolated. The nearest large urban centers were Augusta (20 miles northwest), Atlanta (155 miles west and north), and Savannah, Georgia (85 miles to the southeast) and Columbia, South Carolina (65 miles northeast). Community data was gathered on 21 towns with populations of over 1,000 individuals within a 50-mile radius of the site. The area under investigation contained a number of communities: Ellenton, Jackson, and Hawthorne in Aiken County; and Dunbarton, Meyers Mill, Robbins, Leigh, Snelling, and Hattieville in Barnwell County. Ellenton, a post-Civil War railroad community and local trading center, was the largest with a population of 600. Dunbarton, also a railroad town, had a population of 231 individuals. The remaining communities were smaller. Meyers Mill possessed some stores and a cotton gin, while Leigh

Community Data Collected by During Site Selection Process, Extracted.

Town	App. Miles from Center of town to edge of MFG Area	Population	Transportation	Hotels	Banks	Schools	Hospitals
Williston, SC	14 mi	1,107	State hwy, RR, Bus	1	0	consolidated high and grammar	0
Barnwell, SC	18 mi	1,922	State hwy, RR(2), Bus(2)	1(45 Rms)	1	high, grammar, African American school	emerg. ctr
Aiken, SC	19 mi.	7,067	U.S., State hwy, RR(1), bus(3)	5	2	high(2), elementary(2), private	3
Langley, SC	21 mi.	2,500	U.S., State hwy, RR(1), bus(1)	0	0	high, grade	0
Bath, SC	21 mi.	1,000	U.S., State hwy, RR(1), bus(3)	0	0	grade	0
Graniteville, SC	22 mi.	2,000	U.S., State hwy, RR(1), bus(1)	1	1	high, grade(2)	0
Blackville, SC	28 mi.	1,456	U.S., State hwy, RR(1), bus(2)	1	1	high, grade	0
Augusta, GA	24 mi.	71,000	U.S., State hwy, RR(6), bus(6)	6	6	high(5), jr. high (2), African American school	4
Allendale, SC	34 mi.	2,217	U.S., State hwy, RR(2), bus(2)	6	1	high, grade	0
Denmark, SC	33 mi.	2,810	U.S., State hwy, RR(2), bus(2)	1	1	high, grade	0
Fairfax, SC	39 mi.	1,500	U.S., State hwy, RR(1), bus(2)	2	1	high, grade	1
Edgefield, SC	41 mi	2,502	U.S., State hwy, RR(2), bus(1)	1	1	high(2), grade(2)	1
Johnston, SC	51 mi.	1,385	U.S., State hwy, RR(1), bus(3)	2	1	high, grade(4)	health ctr.
Batesburg, SC	35 mi.	3,188	U.S., State hwy, RR(1), bus(2)	2	2	high (2), grade(2)	1
Hampton, SC	48 mi.	2,000	U.S., State hwy, RR(1), bus(1)	1	1	high, grade	1
Estill, SC	50 mi.	1,661	U.S., State hwy, RR(1), bus(1)	1	1	high, grade(2)	0
Orangeburg, SC	50 mi.	10,275	U.S., State hwy, RR(2), bus(2)	3	3	high, jr. high, grade(10)	2
Varnville, SC	50 mi.	1,200	State hwy, RR(1), bus(1)	0	1	high, grade(2)	1
Branchville, SC	50 mi.	1,650	U.S.,State hwy, RR(1), bus(1)	1	1	high, grade	1
Bamberg, SC	40 mi.	3,000	U.S.,State hwy, RR(1), bus(3)	1	1	high, grade	0
Saluda, SC	51 mi.	1,590	U.S.,State hwy, RR(0), bus(2)	1	1	high, grade	health ctr.

was synonymous with a box and crate manufactory, the Leigh Banana Case Company, that operated at that site between 1904 and 1954, employing about 300 people in 1950.

Camp Gordon, Oliver General Hospital, Daniel Field, and the Augusta Arsenal were military installations less than 26 miles from the proposed site. Six airports—five municipal fields on which there was a recapture clause in case of war, and one USAF inactive airfield—were within 40 miles.[23] The existing road system was composed of state highways that intersected with U.S. highways and, in addition, there was a well-defined network of unpaved farm-to-market dirt roads. Rail service was already in place. The Charleston and Western Carolina (CWC) Railroad paralleled the river, providing service from Savannah to Augusta, and the Atlantic Coast Line Railroad ran from Barnwell to

Source: Charles Topping, *Plant 124–Site Survey*. (Wilmington: E. I. Du Pont De Nemours & Co., 1950).

Town	Recreation	Available Housing	Housing Under Construction	Electricity	Gas	Churches
Williston, SC	Movie, pool	limited	limited	yes	0	3
Barnwell, SC	movies(2), golf, state park, pool	0 houses, 40 apts plenty of capital	0	yes	0	4
Aiken, SC	movies(2), polo, golf(2) horseriding	100 (mostly apts) plenty of capital	mostly homes	yes	yes	15
Langley, SC	0	0	0	yes	0	5
Bath, SC	Park	0	0	yes	0	3
Graniteville, SC	park,pool, baseball	0	0	yes	0	6
Blackville, SC	movie, baseball, pool	0	0	yes	0	5
Augusta, GA	movies (10), parks, golf, baseball	many apts avail just built, plenty of capital		yes	yes	130
Allendale, SC	movie, park	12 houses	0	Yes	0	5
Denmark, SC	movies(2). parks(2)	0	0	yes	0	4
Fairfax, SC	movie, pool	0	0	yes	0	5
Edgefield, SC	movie. pools(2)	10	0	Yes	0	10
Johnston, SC	movie, park	0	0	Yes	0	5
Batesburg, SC	golf, movie, pool	16	24	Yes	0	6
Hampton, SC	movie, pool	4	8	Yes	0	4
Estill, SC	movie, pool	0	0	Yes	0	6
Orangeburg, SC	movies (6), stadium, parks(8), rec ctr	70	100	yes	0	7
Varnville, SC	movie, pool	3	0	yes	0	4
Branchville, SC	movie, pool	0	0	yes	0	3
Bamberg, SC	movies(2), pool, baseball	capital available		not given	not given	not given
Saluda, SC	movie, baseball	0	0	yes	0	4

Robbins where it joined the CWC line. The CWC ran through Ellenton and Dunbarton, and the smaller communities were railroad stops on the line.

Three companies provided power to area residents and businesses: South Carolina Electric and Gas Company, Aiken Electric Cooperative, and Salkahatchie Electric Cooperative. Two phone companies, Southern Bell and Cassels Telephone Company, were communications providers, and there were telegraph offices in Ellenton and Dunbarton. U.S. post offices were located in Meyers Mill, Ellenton, and Dunbarton.[24]

DU PONT'S RECOMMENDATION

On November 10, 1950, Du Pont advised Walter J. Williams, the Commission's Director of Production Division, that the plant be located on the Savannah River. Five reasons were given for the choice:

1 - It met the basic criteria for isolation from centers of population. There was sufficient room to locate six reactors no less than two miles apart with minimum air-line distance from reactors to Aiken, South Carolina, and Augusta, Georgia, of nearly 20 and 25 miles, respectively.
2 - Savannah River water was considered chemically excellent.
3 - The land to be acquired was considered marginal for agricultural use, producing mainly non-food crops such as cotton.
4 - The soil was characterized as sandy and well drained. The climate was favorable to construction.
5 - Based on generic estimates, lower construction costs were expected in South Carolina.[25]

The Texas site was eliminated due to its poor water quality, while the Midwest site was not sufficiently isolated and the plant would be placed in a farming environment devoted to subsistence (food) farming. The Wisconsin site did not possess sufficient advantages that would make the survey team consider choosing a site out of the preferred region. Evans pointed out that the evaluation of sites was predicated on minimum requirements. With the site selection complete, Du Pont moved forward to a more detailed study to recommend specific property boundaries. "This recommendation will give consideration to efficient plant layout, natural boundaries, principal traffic arteries, topography, efforts to restrict growth of nearby population centers, provision for adequate safety distances required for reactors of potentially higher power level, and possible future expansion."[26]

The search had lasted from mid-June through early November. Using the Du Pont method, the site-selection team had scoured about one-third of the United States. Twenty-nine copies of Topping's compiled *Plant 124–Site Survey*, replete with maps and supporting data, were prepared for submission to the AEC. The Site Review Committee met on November 20 to discuss Du Pont's findings. The committee had been advised by the Commission to look hard at the survey criteria, which would be the basis for the final Du Pont recommendation. This suggests that the Commission felt that Du Pont's recommendation would naturally reflect a "technical point of view."[27] The commission would be

responsible for explaining to the American public all of the variables involved in the site selection; an explanation that could be difficult to muster if non-engineering considerations in the public's interest had received short shrift. Despite this caution, the Site Review Committee unanimously concurred with the Du Pont recommendation.[28] A meeting was set for November 22 between Commission officials and Du Pont to give the site-selection team a forum in which to fully disclose their findings.

BOUNDARY DEFINITION AND REACTOR SAFETY

Seven Du Pont engineers were present at the morning meeting on November 22, 1950, in Washington to present the results of the site selection and their recommendation on site boundaries. The engineering manpower was needed as the AEC learned that Du Pont was recommending the acquisition of 240,000 acres rather than the 160,000 first projected. This increase was based on developing design issues, specifically that the proposed reactors' operating power could be increased by 25 percent several months of the year. The size of the exclusion area around each reactor was calculated on the basis of thermal power, and the power increase expanded the exclusion zone from 5.5 miles wide to 6 miles. Du Pont also felt it prudent to create a wider buffer zone between the reactors, preferring a 2.5-mile area between any two, to ensure more security against collateral damage from "strategically placed missiles." Traditionally, the distance was 1 to 2 miles. In addition to expanding the site perimeter to accommodate the larger exclusion area, Du Pont wanted possession of the area along the river to shorten the distance needed to pump water to the reactor areas. Finally, they requested acquiring more property on the northwest side of the proposed site that adjoined the highway and railroad. The motivation for this increase was to regulate anticipated private development there.[29]

The increased acreage requirements and the concomitant increase in the number of individuals who would be displaced were grave concerns to the Commission. The closing of the through highway seemed untoward, and the proposed evacuation of existing communities such as Jackson and Ellenton was not well received. It was pointed out to Du Pont that problems of unrestricted growth adjacent to the plant boundaries could, and would, occur regardless of where the boundaries were set.

Granville M. Read, Monte Evans, and Charles Topping rebutted. First, the additional acreage required was composed of two small triangles of land on the riverfront plus the town of Ellenton. This additional river frontage and the town site were needed to provide security for the vital water supply lines, to allow engineers flexibility in locating river pumphouses, and as a natural boundary. Dunbarton was too close to the manufacturing area, so it needed to be evacuated, and the remainder of the newly requested land was the result of the new exclusion area that was specified by formulae produced by the Reactor Safeguard Committee of the AEC. The commissioners offered some comment, noting that the existing community of Jackson might be better left out of the site boundary as workers could find housing there, and that it might be easier to control development in an existing community than in an unzoned undeveloped area.

No formal decision was made to approve the site, but November 28 was decided as the date for the public announcement, and the official name for the site, the "Savannah River Plant," was designated. On November 26, Commissioners Henry D. Smyth and T.

Keith Glennan visited the proposed site, touring it by air and by car. They met the next day at Brookhaven National Laboratory with their fellow commissioners to approve the selection of Site No. 5 with the expanded boundaries. Within a week, the Site Review Committee, the Joint Chiefs of Staff, and the AEC's Reactor Safeguard Committee had reviewed the proposal and all agreed with the choice. The commissioners then passed a resolution that allowed the acquisition of 240,000 acres, more or less, in Aiken and Barnwell counties in South Carolina and requested that the Corps of Engineers handle the acquisition of land. The public announcement remained on schedule for the next day.[30]

FIRST HURDLE - THE EVALUATION OF HAZARDS

While the resolution passed, the records of the November 27th meeting show uneasiness on the part of the Commission at the new boundaries. The inclusion of towns such as Jackson, Snelling, and Ellenton was troublesome, and Commissioners Glennan and Smyth's field inspection indicated that each, along with good farm land, was located at the periphery of the recommended site boundary. In their opinion, a slight adjustment in the proposed boundaries would dramatically decrease the number of individuals who would be affected by the plant. Seeking a less intrusive solution, they would argue that the perimeter towns, including Ellenton, be left alone.

The Du Pont position was clearly based on technical concerns. On one hand, the commissioners were impressed by the importance of the evaluation of hazards associated with the operation of production facilities for fissionable materials that had been conducted by Du Pont. The firm had rigorously followed the Reactor Safeguard Committee's formulae in proposing locations for the reactors and the dimension of the exclusion area around the manufacturing area. The commissioners further recognized that the evaluation of hazards would shape the final boundaries of the site and also would influence the type of control that would have to be exercised over lands within that area to assure the security and safety of operations. However, had the Commission's objective of minimizing the dislocation of people been upheld in the site-selection process? [31]

The Commission requested that Du Pont formally review its suggested layout and site boundaries. Commissioners Smyth and Dean went further, stating that the reevaluation should be conducted independent of the guidelines given by the Reactor Safeguard Committee. The Commission apparently considered the guidelines too conservative.

Monte Evans, Du Pont's General Manager, in a letter to Walter Williams restated his position this time with vehemence:

> …. unwarranted importance is given to protecting the several small towns in the area, some of which must be absorbed to insure safe and efficient development of the site and to allow for possible future growth. Further study has already indicated the desirability

Reactor Safeguards Committee and the Rule of Thumb

This group, established in 1947, was founded to evaluate the safety of nuclear reactors and to advise the AEC on reactor safety matters. Experts in appropriate fields typically from academic backgrounds were asked to participate on the committee that reported directly to the AEC's general manager. In 1950 they prepared a report that contained the first guidance on reactor siting, providing formulae to calculate an exclusion radius for a reactor site. Residential land use would be prohibited in that area. The size of the exclusion area was directly proportional to the proposed reactor's wattage.

Figuring exclusion radius calculations:
1 MW = 1000 KW
$\sqrt{3} = 1.73205$

For 30-MW reactor
$R = 0.01 \sqrt{30{,}000}$
$R = 0.01 \times 173.2$
$R = 1.732$ mi.

For 3000-MW reactor
$R = 0.01 \sqrt{3{,}000{,}000}$
$R = 0.01 \times 17329$
$R = 17.320$ mi.

Unhappy with the conservatism of their guidance, the commission established an Industrial Committee on Reactor Location Problems in 1951. It is likely that the problems that occurred with the boundary definition of the Savannah River Plant played a role in its establishment. The new group was given the responsibility of advising on the location of nuclear reactors. Their advice, arrived independently of their predecessors, was the same, so the two were combined into the Advisory Committee on Reactor Safeguards (ACRS) in 1953.

Source: David Okrent, *Nuclear Reactor Safety On the History of the Regulatory Process*. (Wisconsin: The University of Wisconsin, 1981), 4.

> of shifting the manufacturing area slightly to the South. A shift toward the river would have obvious advantages. Of the small communities, Ellenton, which lies in a likely path for water supply lines, and to a lesser extent Dunbarton, present the most serious problems. To permit them to remain as uncontrolled communities would, in our judgement, create an almost intolerable situation. As islands of uncontrolled population they would present serious safety and security problems. It is inconceivable that they could retain their present character in the changing environment and, deprived of their surrounding agricultural areas, it is unlikely that they would retain their present means of livelihood. Not only would the towns represent a continuing problem to the Commission and the Company, but also we would expect them to become increasingly unattractive places of residence to many of the present inhabitants. We feel that this problem should be attacked positively when public-mindedness can be expected to be highest. Temporizing with the problem can be expected to aggravate it.[32]

The boundary dispute continued through December. Beside contract negotiations, it was the first project-related hurdle between the Commission and its contractor and it was not officially solved until one month after the public announcement. Essentially, there was a compromise rather than a solution. By moving the manufacturing area slightly, Du Pont was able to shift perimeter boundaries to exclude the towns of Jackson and Snelling. Ellenton and Dunbarton, because of their geography within the proposed layout, remained inside the proposed boundary. This change would placate the "dissenting commissioners" but retain the majority of the layout that Du Pont had proposed earlier without sacrificing any security or safety issues. South Carolina State Highways Nos. 28, 64, 19, and possibly 781 were to be closed to the public at the site boundary.

The proposed layout allowed for five reactors, with two potential areas left for expansion. A safety distance of 2.5 miles between any two major manufacturing areas remained. While this remained in accordance with the guidance provided by the Reactor Safeguard Committee, Du Pont shifted the emphasis of their argument, pointing out that the layout satisfied strategic military concerns. Professor Harry L. Bowman, a consultant on structural design, and the U.S. Air Force confirmed the need for this separation interval to reduce the chances of multiple damage to critical facilities as a result of enemy action or sabotage.[33] It was also considered necessary to confine the effects of a possible accident without interrupting production at the other reactors. While the commissioners were correct in characterizing Du Pont's approach to the site-selection process as technically driven, they had underestimated the chemical firm's almost religious adherence to safety. In a final rejoinder, Monte Evans stated, "We are confident the factors of safety are not extravagant under the circumstances."[34] The AEC agreed.

With these changes, the new site finally came into being. On December 28, the Corps of Engineers received the final go-ahead to acquire the needed land.[35] The legal basis for the acquisition had already been established on September 27 with the passage of Public Law No. 843, giving the AEC the authority to acquire land for a plant to produce radioactive products.[36]