

## NEW JOHNSONVILLE, TENNESSEE REVISITED: CASE STUDY OF AN INDUSTRIAL AREA

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### ABSTRACT

New Johnsonville, Tennessee is one of the youngest towns in Tennessee and also a rapidly growing industrial site. This is due to the favorable locational factors of labor, power, water, raw materials, transportation and recreation.

Most of the industries of the area are classified as heavy industry. E. I. Dupont, Foote Mineral, Consolidated Aluminum, and Inland Container Corporation are a few of the industries of the area.

All in all, these industrial plants, as indicated by numerous field surveys concerning industrial employment, production, distribution and marketing variables, contribute significantly to the economic climate of the state.

### INTRODUCTION

Located on the east side of the Tennessee-Kentucky Lake and approximately 75 miles west of Nashville, New Johnsonville, Tennessee, is the youngest town in Humphreys County. The town derived its name from the old town of Johnsonville, which was formerly located a few miles downstream and existed for nearly a century without appreciable growth. When Kentucky Reservoir, impounded by the dam at Gilbertsville, Kentucky, inundated Johnsonville in 1945, the town was relocated at what is now New Johnsonville and a new railroad and highway bridge were constructed.

Characterized by a small collection of residences and a population of approximately 600, New Johnsonville is a rapidly growing industrial area. Thus the purpose of this paper is to analyze the industrial growth in the New Johnsonville area between 1966 and 1976. Actually, the analysis updates the author's study made in 1966 (Chester, 1966).

### FACTORS OF INDUSTRIAL LOCATION

Complex factors determine the location of manufacturing. Modern industrial corporations, in analyzing new locations for plants, should consider five main factors—power, labor, transportation facilities, land, water, and recreational facilities. Other less significant factors, depending on the type of secondary activity, are industrial linkage, infrastructure, internal and external economies. Most of these factors are industrially favorable in the New Johnsonville area.

*Power.* Covering 575 acres and employing 588 people, the Tennessee Valley Authority steam plant at New Johnsonville was the first large, modern, and economical thermoelectric power plant. It was originally constructed as a six unit operating establishment and began operations October 27, 1951. The six units have

a capacity of 794,000 kilowatts. Four additional units were completed on August 20, 1959, with a capacity of 691,000 kilowatts or a combined total capacity of 1,485,000 kilowatts.

Coal, obtained from Western Kentucky coal fields by barge, is used as a source of energy to operate the boilers. The consumption of coal is approximately 3,500,000 tons a year. The boilers can produce 11,600 BTU's per pound of coal, and the stacks are being equipped with electrostatic precipitators.

The cost of power as part of the total costs is usually not significant (Miller, 1970). Therefore, plants are not located at a particular place because of a power cost differential. However, power reliability is an important locating factor for such industries as those in the New Johnsonville area.

*Labor.* There is an abundance of potentially skilled labor in Humphreys and surrounding counties. In fact, the unemployment rate of this area is approximately six percent. Therefore, the availability of potentially skilled labor in the surrounding counties is an important factor accounting for industrial growth of the area.

Industries that do not have well developed internal economies find the area lacking in skilled labor, especially electricians and plumbers. However, a technical trade school has recently been established approximately 35 miles east of New Johnsonville, which may mitigate the present situation. All in all, the labor force has been an advantageous factor for industrial development.

*Transportation.* In many cases, high wage-labor extensive industries demand specialized transportation such as rail or water. Contrarily, "footloose" or low wage plants rely greatly on trucking companies or their own private trucks for the transportation of both raw materials and finished products (Lineback, 1972).

New Johnsonville is not located near the center of the nation's industrial activity. However, federal highway 70 and the Louisville and Nashville Railroad, connecting Memphis and Nashville, run parallel through the area. Also, interstate 40, an east-west route, is located 10 miles to the south of the study area, and the Tennessee-Kentucky Lake provides a navigable waterway for transporting coal, other bulky raw materials, and finished products by barge. In addition, a small airport is located five miles east of New Johnsonville.

Located on these transportation routes, the site of New Johnsonville is readily accessible in respect to sources of raw materials and markets.

*Land.* Abundant level land along the reservoir is available at premium prices for industrial development.

Many industries require large acreage for initial location and possible expansion; therefore, the favorable land availability factor of the area is a great asset. Related to this factor is the equalized tax assessment on industrial property as assessed by Humphreys County. Obviously, this is another factor favoring industrial growth.

**Recreation.** The area is well endowed with a wide variety of recreational activity. However, most of it is associated with the Tennessee-Kentucky Reservoir which allows the people of the area to enjoy fishing, boating, hunting, and camping as part of their regular recreational activity. In addition, five parks—three state and two national—are located within a 50 mile radius of New Johnsonville.

#### INDUSTRIAL GROWTH

A recent field survey at the study area revealed that older industrial establishments, located outside the city

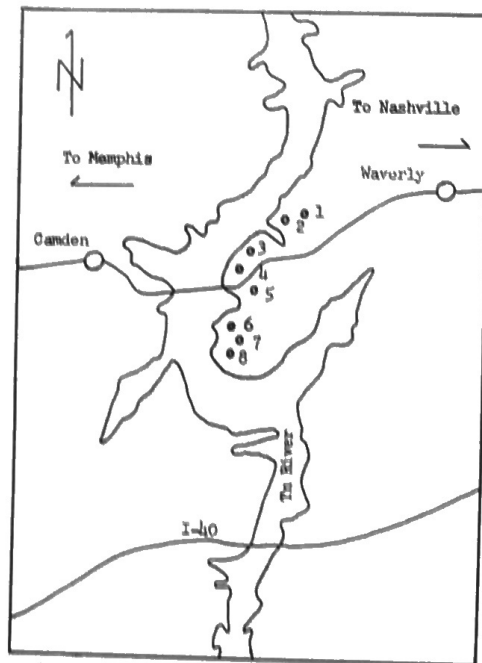


FIG. 1. Location of Industries in the New Johnsonville Area.

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|----------------------|----------------------|
| 1. Inland Container  | 5. New Johnsonville  |
| 2. Consolidated Alu. | 6. Foote Mineral Co. |
| 3. Dupont            | 7. Vanguard Industry |
| 4. TVA Steam Plant   | 8. Charmin Paper Co. |

limits, have shown tremendous growth between 1966 and the present, and during the same time frame new industries, as shown in Figure 1, either developed or purchased building sites.

**E. I. Dupont.** E. I. Dupont was the first large industry to enter the area. In 1952, the company acquired a 1,500 acre site for \$225,000. In March, 1957, plant construction began on 160 acres and in January, 1959, the plant began production of pigment. Since 1959, the installation has experienced seven expansions.

The pigment plant is the world's largest single producer of titanium dioxide, which is a fine, dry, white powder. The  $TiO_2$  is obtained from ilmenite ore, mined from sand deposits near Starke in north Florida. It is also imported from Australia, India, and Malaysia. The domestic production is shipped to New Johnsonville by rail.

The pigment is made by a process involving the chlorination of titanium ore at a high temperature. Such a process requires vast amounts of treated water. In fact, the company's water treatment plant filters 2,000 gallons of water per minute and an additional 18,000 gallons of raw river water per minute is required in the process.

The waste product,  $FeCl_3$ , is pumped into four wells which are at least one mile in depth. These wells are monitored very closely and the company plans to use them until 1977. In the meantime, a pilot project is under operation for one year at a cost of 25 million dollars to determine the economic feasibility of converting the  $FeCl_3$  to  $Cl_2$  and recycling it in the chlorination process.

Production capacity of the  $TiO_2$  is approximately 228,000 tons per year and more than half of this is utilized by various industries manufacturing paint, varnish, and lacquer. The next largest demand is for delustering and opaquening in the paper industry. Therefore, the product goes in bulk or 50-pound bags to industrial use rather than directly to the consumer.

Since 1964, employment has increased from 425 to 860, and many of these are semi-skilled to skilled non-union employees. The annual payroll is obviously a great asset to the area.

**Conalco.** Construction of Consolidated Aluminum Corporation's first primary aluminum reduction plant was completed near New Johnsonville, Tennessee in September, 1963. According to Conalco officials, various sites were considered before the final decision was made to locate at New Johnsonville. Apparently, the present site became the most favorable when the Tennessee Valley Authority made 240 acres of land available for purchase at an extremely low price.

Conalco, with headquarters in St. Louis, Missouri, was formed through the merger of Consolidated Aluminum—a subsidiary of Swiss aluminum, Ltd.—with Phelps-Dodge Aluminum Products Corporation in April, 1971. In January, 1974, the Corporation purchased the aluminum assets of the Olin Corporation for \$126 million. Operating a total of 21 plants, the company is the fourth largest producer of aluminum in the United States.

Alumina is refined from bauxite in Jamaica and Guyana and transported by barge by way of the Mississippi, Ohio, and Tennessee Rivers to Conalco's own dock facilities. The alumina is unloaded by a pneumatic

system and stored in five silos that have a total storage capacity of 65,000 tons.

Employing 625 people, the corporation produces 140,000 tons of aluminum from four potlines. Power is a very important factor in this output since approximately 20,000 kilowatt hours of electric energy are required to produce one short ton of metal. The New Johnsonville thermoelectric plant provides the required energy at premium rates.

The 1973 local plant payroll plus fringe expenses totaled \$6,075,000. It is axiomatic that this establishment is economically significant to New Johnsonville and the peripheral areas.

**Foote Mineral Company.** Foote Mineral Company of Exton, Pennsylvania has facilities in five states and one of these is an electrolytic manganese plant in New Johnsonville. The \$10.5 million facility on a 650-acre site has the distinction of being one of only six such plants in the world—three of them in the United States.

There were many factors that influenced the company to locate in the study area. However, the basic requirements of electricity and water were met by the TVA steam plant and the Tennessee River. A less significant factor was the availability of a good supply of man power, which could be easily trained "on-the-job" for a "heavy industry."

The company obtains ore mainly from Australia and the Soviet Union. Total imports amount to approximately 22 million pounds a year. From this ore, which is about 50 percent Mn, electromanganese is produced. This is the purest form of manganese commercially available, and it is in great demand by steel, aluminum, copper, and chemical industries. (The New Johnsonville Conalco plant is a major customer.)

The plant has various operational aspects, but ore storage, chemical processing/recycling, and water treatment are the most significant ones. The total operation is as fully mechanized and automated as possible. Therefore, only 160 employees are required to produce 20 million pounds of electromanganese per year.

The economy of the area receives a boost of \$1.6 million a year from the payroll of Foote Mineral Company employees.

**Inland Container Corporation.** The most recent industry to locate in the study area is Inland Container Corporation with headquarters in Indianapolis, Indiana. In 1970 the corporation began producing corrugated medium utilizing an ammonia base cooking process (Chester, 1971).

According to a recent field survey, the corporation located at New Johnsonville due to the daily demand of approximately 1,000 tons of raw materials which could be obtained from local forests and farms. Secondly, water was available from Kentucky Lake. In addition, other industrial climatic factors such as labor and transportation were favorable.

The corporation is significantly dedicated to maintaining a high status of environmental quality throughout all production phases. For example, the plant is equipped with primary and secondary treatment facili-

ties for all process water discharged from the plant. These facilities recycle 3½ million gallons of water daily. Also, special cooling towers have been added to prevent thermal pollution of the water in Kentucky Lake. In addition, wood waste products are sold to National Molasses Company to be processed into cattle feed.

Producing 500 tons of corrugated medium daily, Inland employs 185 people with an annual payroll of \$2,275,000. Also, purchases of ammonia, sulfur, machine wire, wet felts and dryer felts, other materials and services, combined with state and local taxes, account for an annual company output that exceeds \$10 million, which is highly significant to the local and regional economy.

**New and Future Industries.** A few industries that have ideas of future expansion have purchased large areas of land in proximity to present industrial plants. One of the most significant of these is Vanguard Industries which will manufacture heavy bridge and barge equipment, plus large steel tanks.

The Charmin Paper Company is also a significant landowner in the area. In addition, a few industrial contractors are beginning to locate in the area. The Tennessee Pipe Company is an example of this type activity.

It is the opinion of the writer that the recent location of these industries is another indication that the study area has a sound industrial climate.

#### CONCLUSION

After examining the New Johnsonville area, it is readily understood that this industrial site is ideal for certain specific industries such as those previously mentioned. Industries that require vast amounts of low rate electrical power should continue to locate in the area. Other industries that consume thousands of gallons of water and demand a site on a navigable waterway for the shipment of bulky raw materials and finished products should be attracted to the area.

Due to well developed transportation, the great distance to population centers does not present a market disadvantage. However, with the continuing development of Southern industries, future industries of the area will have more accessible markets.

All in all, it is the opinion of the writer that New Johnsonville will continue its industrial growth as it seeks those industries with high value-added and high wage characteristics.

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