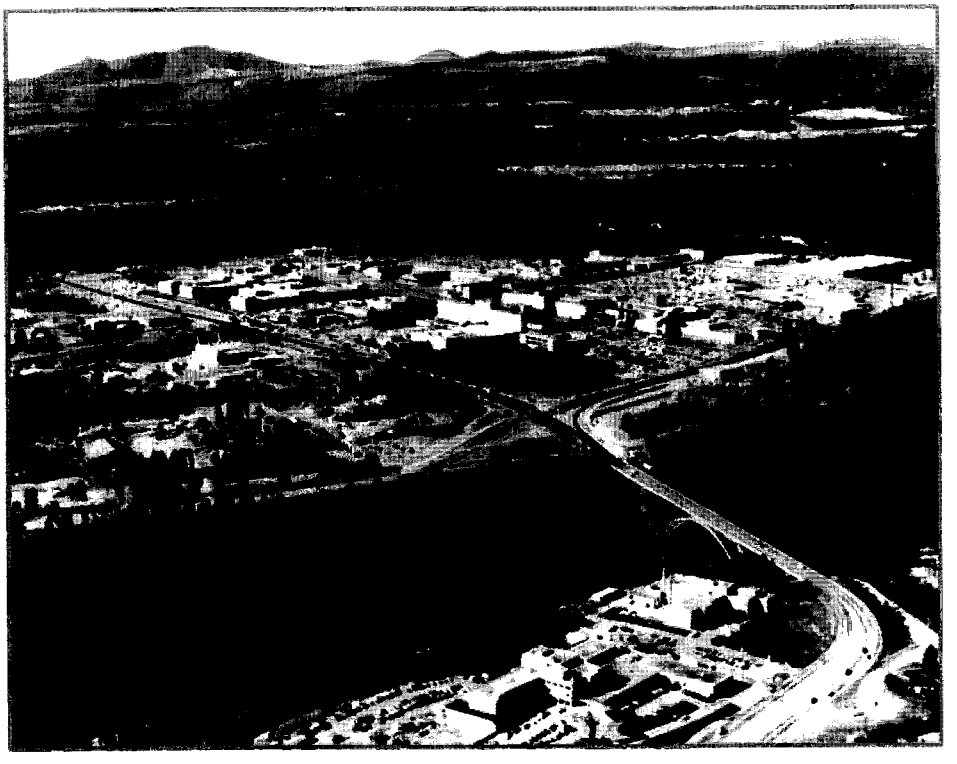
APPENDICES

The Y-12 Plant was established in 1943 as part of the Manhattan Project with a mission to separate uranium-235 from natural uranium using the electromagnetic separation process. Pictured is a view of the Y-12 Plant looking east in 1944.



The Los Alamos National Laboratory was established as a nuclear weapons design laboratory as part of the Manhattan Project in 1943. Pictured is an aerial view of the Laboratory.

APPENDIX A
CHRONOLOGY OF SIGNIFICANT NUCLEAR EVENTS

1930s

1938 Otto Hahn and Fritz Strassmann discover the process of fission in uranium.

1939 Albert Einstein writes President Franklin D. Roosevelt, alerting the President to the importance of research on chain reactions and the possibility that research might lead to developing powerful bombs.

1940s

1940 Alfred Nier completes isotopic separation of uranium-235 and uranium-238 using electromagnetic methods.

1942 President Roosevelt approves production of the atomic bomb, the Manhattan Engineer District is established in New York City, and scientists led by Enrico Fermi achieve the first self-sustained nuclear chain reaction.

1943 Construction starts on the Y-12 Plant and Oak Ridge Gaseous Diffusion Plant in Oak Ridge, Tennessee. Los Alamos National Laboratory is established as a nuclear weapons design laboratory in Los Alamos, New Mexico.

1944 First electromagnetic uranium separation operations begin at the Y-12 Plant.

1945 U.S. conducts first nuclear weapon test, code named "Trinity." First unit of the Oak Ridge Gaseous Diffusion Plant begins initial operation and the first uranium bomb, called "Little Boy," is dropped on Hiroshima. Sandia National Laboratory is established as a nuclear weapons design laboratory in Albuquerque, New Mexico.

1946 President Truman signs the Atomic Energy Act of 1946 to ensure that the development of nuclear energy is conducted in a manner consistent with the security of the United States.

1947 In accordance with the Atomic Energy Act of 1946, all atomic energy activities are transferred from the Manhattan Engineer District to the newly created Atomic Energy Commission (AEC). Brookhaven National Laboratory is established in Upton, New York. Knolls Atomic Power Laboratory is established to conduct research and development for the design and operation of naval nuclear propulsion plants.

1948 The U.S. Navy creates the new Nuclear Power Branch within the Bureau of Ships for the purpose of establishing the Naval Nuclear Propulsion Program.

1949 The Idaho National Engineering and Environmental Laboratory is established near Idaho Falls, Idaho, as the National Reactor Testing Station to provide an isolated location where prototype nuclear reactors could be designed, built, and tested.

1950s

1950 Expansion program to develop thermonuclear weapons is announced by President Truman.

1951 Construction starts on the Paducah Gaseous Diffusion Plant in Kentucky. Nevada Test Site is established near Las Vegas, Nevada, with a primary mission to ensure the safety

and reliability of the Nation's nuclear weapons stockpile. AEC begins rehabilitating the Pantex Plant near Amarillo, Texas, for nuclear weapons operations. Rocky Flats Plant is established near Golden, Colorado, for nuclear weapon component fabrication.

1952 Construction starts on the Portsmouth Gaseous Diffusion Plant in Ohio. Lawrence Livermore National Laboratory is established as a nuclear weapons design laboratory near Livermore, California.

1953 First unit of the Paducah Gaseous Diffusion Plant begins operation and construction is completed of the first pressurized-water naval nuclear propulsion plant.

1954 First unit of the Portsmouth Gaseous Diffusion Plant begins operation and the Atomic Energy Act of 1946 is amended to authorize distribution of special nuclear (enriched uranium and plutonium) materials for domestic and foreign programs.

1955 U.S.S. *Nautilus* (SSN 571), first nuclear powered submarine, becomes operational.

1956 Project Rover is initiated to determine feasibility of utilizing nuclear energy for rocket vehicle propulsion.

1957 The International Atomic Energy Agency (IAEA) is established.

1960s

1963 The Portsmouth Gaseous Diffusion Plant starts producing very highly enriched uranium for naval reactors.

1964 Curtailment in the production of enriched uranium and plutonium is announced by President Johnson. Four reactors (one at Savannah River and three at Hanford) were to be shut down. K-25 and K-27 buildings were shut down at the K-25 Site, while the K-29, K-31 and K-33 buildings continued to operate, producing low enriched uranium.

1968 The B-Reactor at Hanford and the L-Reactor at Savannah River are shut down. The Hanford F and H Reactors, formerly in standby mode, were abandoned for future production use.

1970s

1970 Nuclear Nonproliferation Treaty (NPT) entered into force.

1971 The KE reactor at Hanford is shut down.

1975 Energy Reorganization Act of 1974 abolishes the Atomic Energy Commission and creates the Energy Research and Development Administration (ERDA).

1977 ERDA and NRC release a comprehensive report on strategic special nuclear material inventory differences. The Department of Energy Organization Act creates the Department of Energy (DOE) to develop a strong national energy program to meet future energy needs.

1978 Nuclear Non-Proliferation Act of 1978 is enacted.

1980s

1985 K-25 Site placed in standby mode.

1987 K-25 Site placed in shutdown mode.

1988 C, K, L and P-reactors at Savannah River are shut down.

1990s

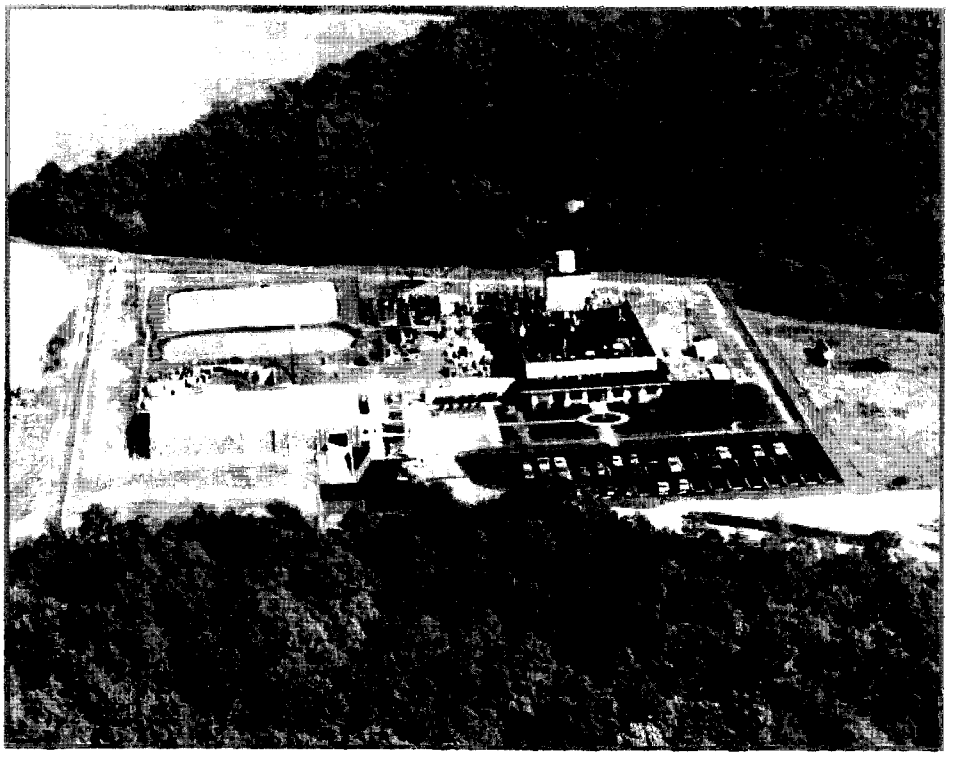
1992 Production of HEU is terminated. Public Law 102-486 is enacted to establish the U.S. Enrichment Corporation (USEC) to lease/run the Paducah and Portsmouth Gaseous Diffusion Plants. The last U.S. nuclear weapons test, called "Divider," is conducted at the Nevada Test Site. Presidents Bush and Yeltsin announce plans to reduce the U.S. and former Soviet strategic arsenals.

1993 K-Reactor at the Savannah River Site is restarted and shut down. President Clinton signs Presidential Directive on Nonproliferation and Exports Controls to accelerate the return of U.S.-origin spent nuclear fuel. On December 7, 1993, the first Openness Press Conference is held with a primary focus on the plutonium inventory and weapon test information.

1994 June 27, 1994 - Openness Press Conference held. Primary focus is on classified issues, nuclear material inventories and additional weapons testing information. U.S. acquires HEU from the former Soviet Republic of Kazakhstan under the code name "Project Sapphire."

1995 President Clinton declares 200 metric tons of HEU and plutonium as excess to national security needs.

1996 February 6, 1996 - Openness Press Conference held. The DOE releases a report on plutonium inventories entitled *Plutonium: The First 50 Years*, and a report on fundamental classification policy review; updated Departmental declassification efforts; and releases the location, form, and quantity of plutonium and HEU declared surplus to national security needs.



In the 1960s and 1970s, several commercial companies were involved in processing and fabricating HEU. The United Nuclear Corporation Recovery Systems facility, located in Wood River Junction, Rhode Island, was engaged primarily in processing scrap material to recover enriched uranium. Processing operations continued until 1980, when United Nuclear Corporation terminated operations and initiated decommissioning.

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