WE ARE SAVANNAH RIVER NUCLEAR SOLUTIONS

safety

security

technology

environment

leadership for America's future

Savannah River
Nuclear Solutions, LLC
A Fluor Daniel Partnership℠

The Savannah River Site

We take pride

in our historic role
in America's defense.

We actively engage

in our environmental
management mission.

We work toward the future

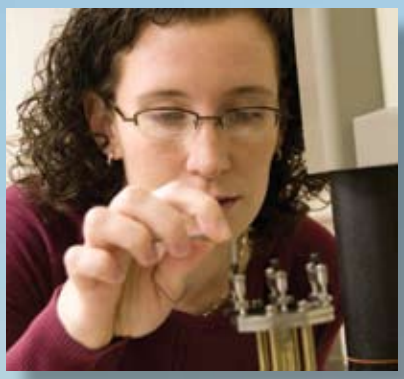
by using applied science
to meet the nation's need
for homeland security
and energy independence.

The Savannah River Site is a dynamic partner

in helping to shape the nuclear future of the United States.

Savannah River Nuclear Solutions looks forward

to our continuing role in transforming challenges into solutions.



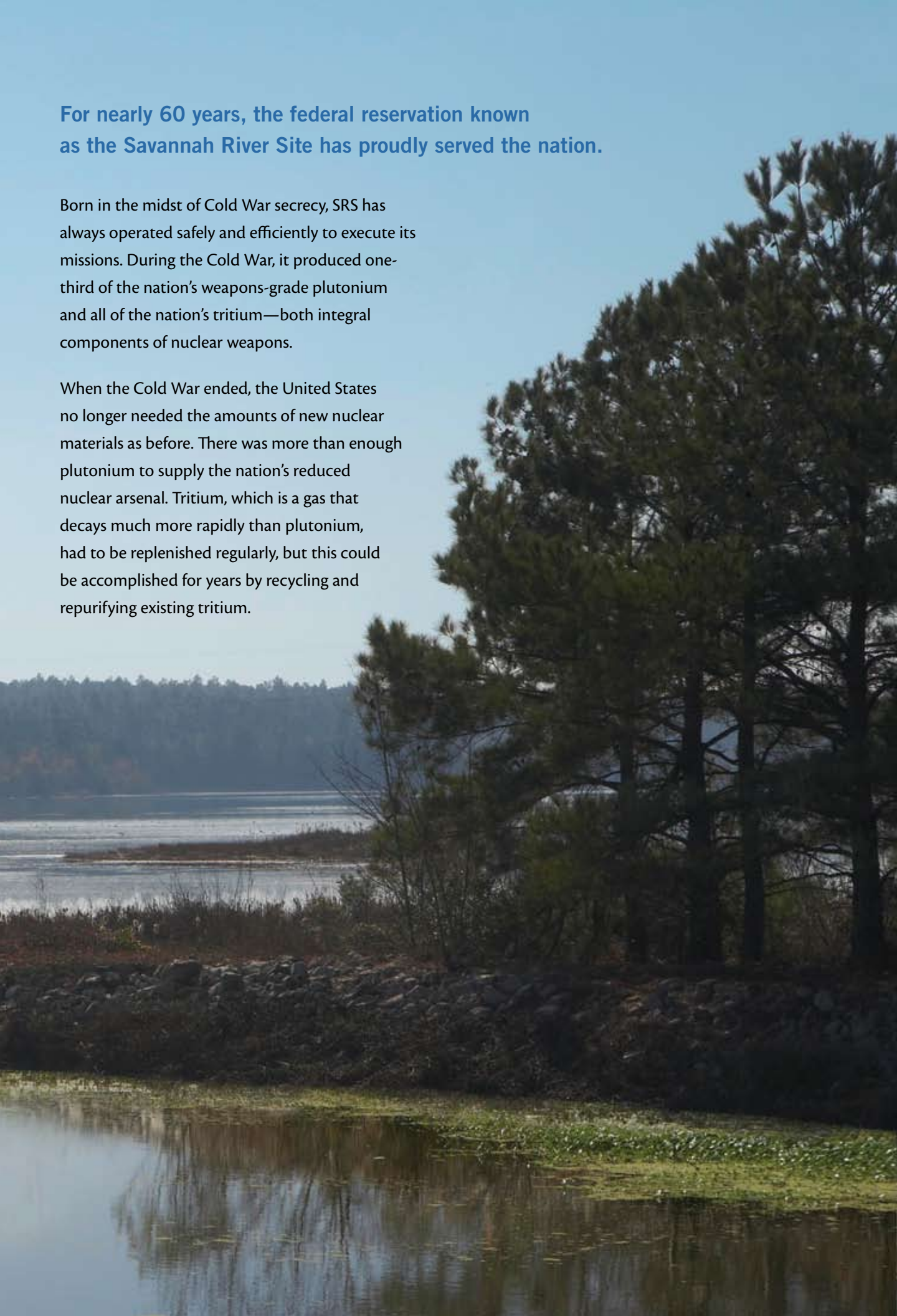
Savannah River Nuclear Solutions

We are defined by our commitment to safety, service to our nation, exploration and use of technology, and conservation of the environment.

For nearly 60 years, the federal reservation known as the Savannah River Site has proudly served the nation.

Born in the midst of Cold War secrecy, SRS has always operated safely and efficiently to execute its missions. During the Cold War, it produced one-third of the nation's weapons-grade plutonium and all of the nation's tritium—both integral components of nuclear weapons.

When the Cold War ended, the United States no longer needed the amounts of new nuclear materials as before. There was more than enough plutonium to supply the nation's reduced nuclear arsenal. Tritium, which is a gas that decays much more rapidly than plutonium, had to be replenished regularly, but this could be accomplished for years by recycling and repurifying existing tritium.



SRS is located in south-central South Carolina and occupies an area of about 310 square miles in Aiken, Barnwell and Allendale counties. It is owned by the Department of Energy (DOE), and the management and operating contract is held by Savannah River Nuclear Solutions, LLC, (SRNS) a Fluor Daniel partnership. Northrop Grumman and Honeywell are other partners.

SRNS employs about 6,000 people. Another 4,000 are employed by other companies and federal agencies. Overall, SRS is a prime contributor to the local economy, generating over $200 million each year in procurements, over $250 million in federal and state payroll taxes, and more than $97 million in routine medical claims.

One of the foundation sites for U.S. nuclear weapons production, the Savannah River Site is now a key player in our country's nuclear future.

A new focus began—on cleaning up the Cold War legacy and downsizing the nation's nuclear complex.

For the next years, the men and women of SRS did those things as safely and proudly as they had worked for the national security. Along the way, other nuclear sites across the nation closed down, and their materials were sent to South Carolina for safekeeping because of the security excellence and unparalleled history of safety performance that existed there. Finally, there existed a mere handful of operating sites, and those sites became the bedrock of the United States' nuclear future.

Processing R&D test cells
in the Sample Assay Station
in one of the tritium facilities

Today, SRS is an interesting contrast. Of its 198,000 acres, about 90 percent is pine forest and teeming swampland. The property is a National Environmental Research Park and is home to several endangered species. Waterfowl and other wildlife are plentiful. Entire areas have been razed, as they were home to buildings and operations that were no longer needed. Nature has begun to take those areas back.

On the other 10 percent, however, the business of serving the nation is still very real. In a reduced, centralized core, operations continue, some in refurbished, robust buildings that were part of the original construction in the early 1950s. Other work takes place in modern facilities that were designed and built to be an enduring part of the nation's nuclear future. This work includes conducting research and development at one of the United States' national laboratories; converting highly enriched uranium into materials suitable for use in commercial nuclear reactors; producing new tritium for national security; receiving and storing spent nuclear fuel from across the nation and around the world; consolidating the nation's plutonium and uranium; managing wastes; cleaning up and removing excess buildings; and remediating soil and groundwater.

Cleanup efforts were intensified in 2009 when the American Recovery and Reinvestment Act sent more than $1.6 billion to SRS, to be used to put Americans to work and accelerate cleanup on specific jobs to be completed by September 2011.

A key part of SRS's success is its unflagging community support. SRS's three managing contractors have always taken seriously their responsibility to their neighbors and stakeholders. Since 1989, SRS employees have contributed over $25 million to United Way agencies, and employees give back on their own time through community service at non-profit organizations and by holding elected and non-elected offices in local churches, organizations and governments. Food drives, toy drives and blood drives consistently net more at SRS than at any other employer in the area. Educational programs are in place to employ students, encourage middle schoolers to choose scientific careers, award grants to teachers for classroom programs, and educate elementary school kids on the environment. Community outreach programs donate cash to organizations and educational institutions.

SRS employees enthusiastically support community service and educational outreach programs.

Tritium Facilities

a vital part of the nation's arsenal

Installing a test fixture into the environmental conditioning centrifuge chamber

Tritium facilities have operated at SRS since the site began production. Historically, tritium is one of SRS's major products. It is a radioactive hydrogen gas that is an integral part of nuclear weapon design.

SRS has been recognized as the nation's center of excellence for tritium, and it is the only place in the United States where tritium extraction and purification now occurs.

Tritium has a half-life of 12.3 years, which means that in 12.3 years, half of the tritium turns to helium. So, it must be continually replenished or recycled to keep the nation's nuclear arsenal viable. SRS's tritium facilities accomplish both these missions.

The Tritium Extraction Facility, which became fully operational in 2007, extracts tritium from fuel targets irradiated in Tennessee Valley Authority reactors. Here, the gas is extracted, purified, and sent to the H Area New Manufacturing Facility (HANM).

At HANM, which became operational in 1994 and received a comprehensive upgrade in 2004, existing reservoirs are received from the Department of Defense (DoD). These reservoirs contain three gases—tritium, non-radioactive deuterium, and helium—and these gases are removed and pumped through a series of hydride beds to separate them. Then, tritium and deuterium are mixed to an exact ratio, and new reservoirs are loaded.

The last step in the process is performed at the H Area Old Manufacturing Facility, which was built in the late 1950s. Here, workers ensure loaded reservoirs are safe and meet specifications. In some cases, non-radioactive insert gases must be added to reservoirs, and this work is done in non-radiological areas at HAOM.

When all work is completed and reservoirs have met all specifications, they are shipped to DoD. SRS's tritium facilities have a proud tradition of excellence and exacting perfection. In more than 50 years of operations, they have never missed a shipment to DOD.

Assembling
test fixtures
in a glovebox

K Area Complex

not your ordinary storage building

Checking one of the control panels in the K Area Complex control room

The K Area Complex (KAC) is home to K Reactor, one of SRS's five original full-scale nuclear production reactors. All five ran for nearly 10 years, and eventually R Reactor – the first to start up – also became the first to shut down in 1964 because the nation no longer needed all five reactors. L Reactor was the next to shut down, but it was restarted when C Reactor shut down due to an irreparable crack in its tank.

K, L and P reactors ran safely until 1988, when they were shut down. The shutdown became permanent for P and L, and K was identified as the one reactor that would be restarted. It underwent numerous renovations, including seismic and structural upgrades and the construction of a cooling tower.

K Reactor restarted in late 1991, completed a successful demonstration run, then shut down in 1992 when the Cold War ended. It was the United States' last operating production reactor. In the late 1990s, the reactor building was refurbished to become a nuclear materials receipt and storage facility. All nuclear materials from the Rocky Flats Environmental Technology Site were shipped here, enabling the early closure of RFETS and the saving of billions of taxpayer dollars.

Today, KAC provides for the handling and interim storage of excess plutonium and other special nuclear materials (SNM) in a safe and environmentally sound manner. It is the only DOE facility that meets all current requirements for safe, secure storage of SNM. Plutonium, uranium and other materials from other DOE sites such as the Hanford Site, the Los Alamos National Laboratory, the Lawrence Livermore National Laboratory and Y-12 are being consolidated here.

Uranium is being processed through nearby H Canyon to produce material suitable for use in commercial power reactors. Plutonium is stored inside special welded containers until the Mixed Oxide Fuel Fabrication Facility, now under construction in F Area, is operational. Some of this plutonium will also be processed through H Canyon.

Performing
a survey
on shipping
containers
stored at the
K Area Complex

L Area Complex

a processing point for peace

Setting radiation rates while handling fuel on a tilt table in the L Area Complex

The L Area Complex (LAC) is the consolidation point for all aluminum-clad spent nuclear fuel from research reactors across the United States and around the world. Offsite fuel has been received at SRS since 1964 as a part of the Atoms for Peace program, under which the United States loaned uranium for research purposes, with the understanding that it would take the materials back again. Now, these receipts are done for nonproliferation purposes as well.

Since 1964, SRS has safely received over 2,290 casks containing over 45,000 SNF assemblies. This work has been accomplished with no lost time injuries since 1992.

LAC is the home of L Reactor, another of SRS's five original production reactors. The reactor itself ceased operations in 1988. The area of the building known as the disassembly basin, an underwater storage facility that served as a cooling facility for L Reactor's fuel during the facility's operational years, was refurbished to accommodate all the fuel destined for L Area during its operational lifetime.

SRS had fuels in all five reactor disassembly basins, as well as in a test reactor and an additional facility called the Receiving Basin for Offsite Fuels, also known as RBOF, which was built specifically to accommodate foreign and domestic research reactor fuel. For years, these assemblies were sent to RBOF and processed through H Canyon.

In 1996, L Basin's equipment was reconfigured to safely handle and store SNF from off-site reactors. To avoid the cost of operating multiple facilities, SRS decided in 1998 to consolidate all the stored spent fuel at SRS into L Basin. By October 2003, all fuel previously stored in K Basin and RBOF had been moved either to H Canyon for processing or L Basin for storage, leaving L Basin as the only remaining SRS fuel receipt and storage facility.

DOE plans to continue to process most of these fuels through H Canyon until its planned shutdown in 2019.

Transporting a fuel bundle
to its storage location
in the L Area Complex

H Canyon

a long, lean separations machine

H Canyon, part of the original construction of the early 1950s, began operations in 1955. It is a chemical separations facility, designed and built to accept irradiated materials from site reactors and chemically separate the useful nuclear products. Flexibility was built into the design, and that flexibility has proven invaluable as the facility has safely and successfully stabilized key plutonium, uranium and neptunium materials. The building's interior is called a canyon because the processing areas resembles a deep valley between steeply vertical concrete cliffs. It is 835 feet long with several levels

to accommodate the various stages of material stabilization, including control rooms to monitor processes; equipment and piping corridors for transport, storage and disposition of solutions; and unique overhead bridge cranes to support overall operations. Today, H Canyon is the only facility of its kind still operating in the U.S. It is an integral part of DOE's nation-wide uranium disposition strategy. Many of the nuclear materials being consolidated in K Area and L Area are destined for final stabilization and disposition here. Current plans are for the canyon to operate until 2019.

HB Line

a powerful path for home and in space

Operating the Hot Canyon Crane to insert uranium material into the 6.4D dissolver

H Canyon and its adjoined sister, HB Line, have safely served both the national defense and the United States' space exploration program for decades. Since the shutdown and deactivation of F Canyon and FB Line in 2006, the H Area facilities are the only ones of their kind still operating in the nation.

H Canyon and HB Line historically recovered plutonium-238, uranium-235 and neptunium-237 from spent nuclear fuel (SNF) that had been irradiated either in SRS reactors or in domestic and foreign research reactors. Since the 1960s, H Area plutonium has provided power for 30 of NASA's deep-space missions.

Unloading a chemical shipment from a tanker truck into a storage tank in the H Canyon Outside Facilities

When the Cold War ended in 1992, DOE concluded that recovery of uranium for reuse in nuclear weapons was no longer necessary. However, there was a significant inventory of material in various stages of the intricate SRS process, which includes many different facilities throughout the Site. DOE decided to resume operations in both F and H areas to stabilize and manage these materials. These operations produced highly-enriched uranium (HEU) and neptunium solutions, which were stored until a disposition path could be determined.

The HEU found a disposition path through the HEU Blend Down program, a weapons-to-plowshares process that began operating in 2003. HEU is blended with natural uranium to form a low-enriched uranium (LEU) solution that is ultimately used to produce power in Tennessee Valley Authority (TVA) reactors. SRS uranium now provides power for homes throughout the Southeast and has resulted in cost savings to taxpayers totaling nearly $250 million to date.

The neptunium, which represented the last of the nation's inventory, was stabilized in HB Line and shipped to Idaho and Oak Ridge. The solutions will be loaded as targets into reactors to produce plutonium-238, which will be used in NASA's deep space probes.

In May 2006, DOE approved the Enriched Uranium Disposition Mission, which uses H Area facilities to dispose of SNF from foreign and domestic research reactors and enriched uranium and plutonium-bearing solutions across the DOE complex. These materials will create more HEU solution, which will in turn be blended and sent to TVA, generating more taxpayer savings.

Reviewing process roundsheet readings in the H Canyon control room

Infrastructure

site services support success

Shipments of transuranic waste leaving SRS, bound for the Waste Isolation Pilot Plant in New Mexico

Support services are absolutely essential to successful day-to-day operations. Financial and administrative support, analytical laboratories, waste management and infrastructure maintenance all are critical to success.

Across SRS's 310 square miles sprawls a vast infrastructure system that includes hundreds of buildings; 1,400 miles of roads; 63 miles of railroad track; untold miles of steam lines; an operating power plant, a new energy-efficient biomass plant; two dams; and numerous bridges and other infrastructure—all of which must be safely maintained.

SRS produces waste that cannot be sent to public landfills. Liquid wastes are stored in million-gallon holding tanks and ultimately are sent to the Defense Waste Processing Facility or the Saltstone facility. Solid wastes are shipped to a disposal area near the center of SRS. There, depending on the content of the waste, it is either disposed of or sent off site for disposal.

Transuranic waste is contaminated with alpha-emitting transuranic isotopes (those with an atomic number greater than uranium, such as plutonium). This waste consists of clothing, tools, rags, residues and other items. It is characterized, packaged, and sent to the Waste Isolation Pilot Plant in New Mexico. More than 30,000 containers have been shipped to WIPP since 2001. TRU disposition is a major emphasis under the American Recovery and Reinvestment Act. By the end of September 2011, a significant portion of TRU waste stored at SRS will be gone.

Much of SRS's solid waste is low-level, which means it can safely be disposed on site. Low-level waste is disposed of either in engineered vaults or, if minimally contaminated, in earthen trenches. Some is sent to off-site facilities in Nevada and Utah.

Also necessary to daily operations are analytical laboratories, which analyze materials throughout the process to ensure they are as expected and required. The laboratories also conduct monitoring to ensure environmental, radiological and industrial safety. Thousands of samples are collected each year, both on and off SRS property, to ensure site operations are not impacting the public or the environment. Other laboratories are dedicated to keeping the site population safe, collecting annual samples from workers, measuring annual doses and analyzing dosimeters worn by radiological workers.

Performing technical oversight
of an Inductively Coupled Plasma-Mass
Spectrometer in radiological containment

Recovery Act at Work

clean it up, close it down, reduce costs

Sorting through waste for repackaging in work funded by the American Recovery and Reinvestment Act

Since about 2003, extensive cleanup and closure work have been completed at SRS under a concept known as Area Completion, which streamlines and accelerates the cleanup process. Excess facilities are removed and soil and groundwater remediation work is performed in an integrated fashion with the full support of DOE, the United States Environmental Protection Agency and the South Carolina Department of Health and Environmental Control. Complete geographic areas that once housed industrial facilities are closed one by one.

SRS marked its first area closure in 2006 when T Area, the site's first operational industrial area, was closed. Demolition work and substantial soil and groundwater remediation have also been completed in M Area, the No. 2 priority area, scheduled for completion in 2011. The SRS goal is to complete all areas within three to five years after liquid waste operations are complete.

In February 2009, over $1 billion was funneled to Area Completion through the American Recovery and Reinvestment Act. The goal was to accelerate cleanup and put Americans to work to achieve tangible cleanup progress over a 30-month period. Through this money, about 2,500 jobs were created or retained, and millions of dollars worth of contracts were issued to outside businesses, most of them local.

Most ARRA work is related to SRNS's safe and permanent closure of over 100 structures. Plans also include cleanup of over 50 contaminated areas. Projects include closure of four geographic areas—D, M, P and R—by the end of September 2011.

Soil and groundwater remediation is closely integrated with deactivation and decommissioning work, often beginning while facility disposition is still taking place. From capping waste sites to installing and operating groundwater treatment units, field remediation work is a top priority. Field work includes closure of inactive seepage basins, rubble pits and disposal facilities. Groundwater cleanup systems operate in nearly every site area.

To date, over 260 buildings, covering more than 2.5 million square feet, have been demolished, significantly reducing the site's footprint and eliminating expensive maintenance costs. And, more than 360 of SRS's 515 waste units have been completed, with more than 2,000 cleanup milestones safely met.

Cutting apart the massive shield door leading into the P Reactor process room

Savannah River National Laboratory

we put science to work

A crucible containing a plutonium and glass melt is removed from a furnace in SRNL's Shielded Cells. SRNL has been exploring various glass forms for the disposal of excess plutonium.

Savannah River National Laboratory is DOE's applied research and development (R&D) laboratory at SRS. By focusing on applied R&D, SRNL puts science to work to develop and deploy technology solutions that address specific problems: the need for new sources of energy, the need to keep nuclear materials safe and secure, the need to clean up and protect our environment.

From the earliest days of the Site, the Savannah River Laboratory (as it was then called) developed the processes and provided the technologies that enabled SRS to start up and operate. Over the years, the Laboratory's applied research and development proved to have usefulness for customers beyond SRS, especially other DOE sites, DOE Headquarters offices and other federal agencies.

In time, increasing awareness of the Laboratory's value to the nation brought the ultimate recognition. In 2004, the Secretary of Energy bestowed the designation of National Laboratory, giving the newly renamed SRNL its rightful place among the elite DOE National Laboratory system, which is recognized as the most comprehensive research system of its kind in the world.

Today, SRNL serves SRS, DOE and the nation in three major program areas: environmental management, national and homeland security, and energy security.

Environmental Management SRNL is the DOE Office of Environmental Management's corporate laboratory. That means that, in addition to developing, testing and deploying technologies and processes to help DOE sites address environmental needs across the nationwide DOE complex, the Laboratory helps EM develop and implement strategies for using engineering and technology to meet their national goals.

Environmental management R&D is a very large umbrella, covering technologies to safely stabilize, immobilize, store, transport and permanently dispose of all types of legacy materials, including low- and high-level radioactive waste and plutonium, uranium and other actinide materials. It also covers chemical and radiological contaminants in the environment and technologies for removing them from the soil and water.

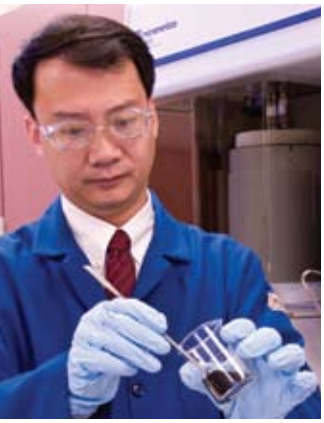
Many biotechnologies developed for cleaning up contaminants in soil or ground water are also being used to understand and apply the most effective ways to convert biomass for energy production. An SRNL scientist tests various organisms for their effectiveness in converting cellulose to ethanol.

Performing research and development on novel trace gas optical sensors to determine impurities in hydrogen process streams

National and Homeland Security SRNL has contributed to national security since the earliest days of the Site, developing technologies used in the SRS tritium mission. SRNL continues to support this important mission, with new developments to enhance safety and performance, including new, simpler, more flexible methods to separate tritium from other hydrogen isotopes.

SRNL also performs important research and development for the safe handling and disposition of plutonium and spent nuclear fuel to advance the nation's nuclear nonproliferation goals.

SRNL's expertise in highly sensitive radiological measurements, analytical chemistry, and microbiology has proven valuable for a variety of homeland security and law enforcement needs. In addition to developing technologies for material collection, detection and analysis, the Laboratory provides training, consultation and support activities for national, regional and local homeland security and law enforcement agencies. The FBI's laboratory facilities for forensic examination of radiologically contaminated evidence are located at SRNL.



Examining an activated carbon substrate to be used to support a platinum catalyst for a fuel cell electrode

Energy Security Meeting the nation's ever-growing energy needs will require a mixture of many approaches, and SRNL is contributing to the R&D for several of them.

SRNL's long history with tritium – a radioactive isotope of hydrogen – has made SRNL an important contributor to the drive for a hydrogen economy, to reduce America's dependence on fossil-based, foreign-produced oil by powering our vehicles with clean, domestically produced hydrogen. The Laboratory is working on technologies and systems for storing hydrogen on-board a vehicle that will be as simple and convenient as your current gas tank, along with technologies for producing the large quantities of hydrogen needed, and for establishing an effective infrastructure for the use and delivery of hydrogen fuel.

At the same time, SRNL is applying its skills in other disciplines to developing and enhancing other environmentally responsible forms of energy, including nuclear, wind, biofuels, as well as clean coal technologies. The Laboratory is a key player in ITER, the international fusion experiment.

A member of the Aiken, S.C., Department of Public Safety demonstrating the use of BritePrint™, a fingerprint detection device invented by SRNL

From its beginnings in 1950,

when President Truman asked E.I. du Pont and Nemours to build pioneering nuclear facilities, to today, when SRS stands as one of few DOE sites chosen to lead the nation into the future, the Site and its people have served the United States safely and well.

SRS traces its roots through nearly 60 years

of history. Each significant event has had dramatic impacts on the Site, its people, and its operations. The employees at SRS have always demonstrated flexibility, patriotism and an unbending can-do attitude. As the budget and the workforce have shrunk, the amount of work that has been safely accomplished has actually increased—which makes a significant statement about the SRS workforce and leadership.

SRS continues to make its mark

on history with innovative research and creative initiatives. Success comes down to one thing—people. The workforce of the future is being built today, with a specific eye on retaining the capabilities and expertise that make SRS's people so valuable, while building on past accomplishments for future success.

For more information
on the Savannah River Site,
visit our website at www.srs.gov.

For more information
on Savannah River Nuclear Solutions, LLC,
contact Will Callicott at will.callicott@srs.gov.

Savannah River
Nuclear Solutions, LLC
A Fluor Daniel Partnership℠

The Savannah River Site is owned by the U.S. Department of Energy.
The management and operating contract is held by Savannah River Nuclear Solutions, LLC.

MEDIASERVICES08N001326KP