Chapter 2: **Environmental Management System**

The Savannah River Site (SRS) Environmental Management System (EMS) supports the U.S. Department of Energy (DOE) commitment to implement sound stewardship policy and practices. These safeguards protect the air, water, land, and other natural, archaeological, and cultural resources that SRS construction, operations, maintenance, and decommissioning potentially affect.

The EMS plans and evaluates SRS activities to protect public health and the environment, prevent pollution, and comply with applicable environmental and cultural resource protection requirements. SRS activities demonstrate the Site's commitment to minimize waste, manage water, foster renewable energy, reduce greenhouse gases, acquire sustainable services, remediate with a focus on sustainability, and observe best management practices, all vital components of environmental management. The SRS Site Sustainability Plan contains more information on DOE and SRS goals and the progress made toward achieving those goals.

2018 Highlights

DOE sets goals for carrying out its mission in an environmentally sustainable manner that supports a policy of national energy security and addresses global environmental challenges. SRS continues to make substantial progress in meeting the goals for the Site. Below are the highlights of the program:

- **Pollution Prevention and Waste Minimization**—SRS recycled 58% (504 metric tons) of nonhazardous solid waste.
- **Greenhouse Gas Reduction**—SRS continued to reduce greenhouse gas emissions. The Site has reduced emissions by 78% since 2008.
- **Transportation and Fleet Management**—More than 98% of the current fleet of light-duty vehicles are hybrid, electric, or vehicles that use E85 (ethanol) fuel.
- **EMS Audit**—SRS had a successful external conformance audit and was declared to be in conformance with the International Organization for Standardization (ISO) 14001:2015 standard. As part of the triennial audit, SRS revised a short environmental policy.

2.1 SRS EMS IMPLEMENTATION

2.1.1 Introduction

DOE has chosen ISO Standard 14001 as the framework to employ its Environmental Management Systems (EMS). The ISO 14001 standard defines an EMS as part of a system that manages an organization's environmental aspects (including activities, products, or services), fulfills compliance obligations, and addresses risks and opportunities. An organization can use an EMS to frame the "Plan-Do-Check-Act" approach to achieve continuous improvement, as depicted in Figure 2-1. The SRS EMS also complies with Executive Order No. 13423, *Strengthening Federal Environmental, Energy, and Transportation Management*; Executive Order No. 13693, *Planning for Federal Sustainability in the Next Decade*; and DOE Order 436.1, *Departmental Sustainability*, which require federal facilities to use environmental management systems. In May 2018, President Trump signed Executive Order No. 13834, *Efficient Federal Operation*, revoking Executive Order No. 13693. This chapter will account for the Executive Order in future Annual Site Environmental Reports, once DOE Headquarters gives SRS guidance on implementing it at the Site. For this year, sustainability reporting will be per the previous Executive Order.

The EMS has two areas of focus: environmental compliance and environmental sustainability. The environmental compliance area consists of regulatory compliance and monitoring programs that implement federal, state, and local requirements, agreements, and permits. The environmental sustainability area promotes and integrates initiatives such as energy and natural resource conservation, waste minimization, green remediation, and the use of sustainable products and services.

SRS trains all employees annually on the EMS policies and requirements. Additionally, the Site generates regular and routine employee communications as a reminder of the SRS commitment to sustainability and the environment.

Chapter 2—Key Terms

Environmental impacts *are any positive or negative changes to the environment caused by an organization's activities, products, or services.*

Environmental objectives *define the organization's environmental goals.*

Environmental sustainability *is interacting responsibly with the environment to conserve natural resources and promote long-term environmental quality. It includes reducing the amount of waste produced, using less energy, and developing processes that maintain the long-term quality of the environment.*

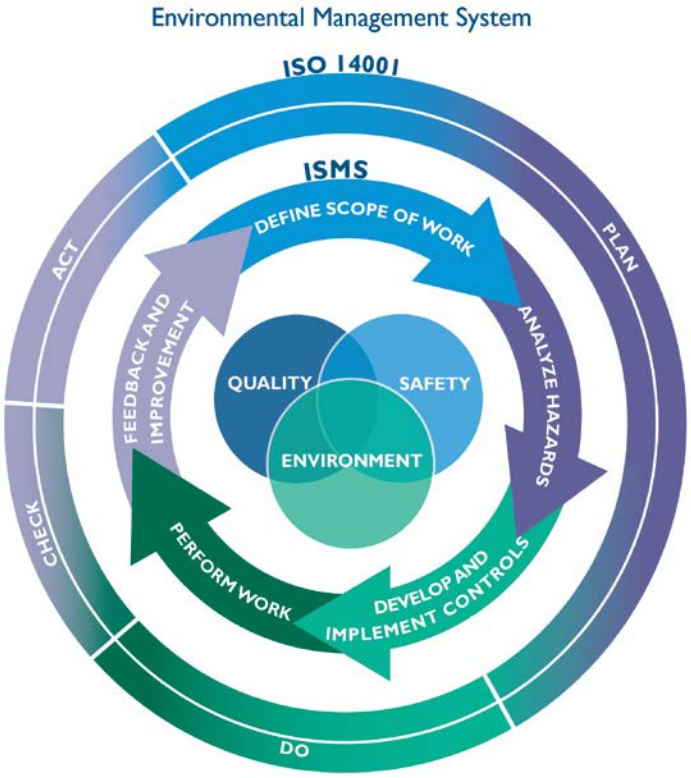

Figure 2-1 Integrated Safety Management System Continual Improvement Framework within the ISO 14001 Environmental Management System

The SRS Integrated Safety Management System (ISMS) is a process that integrates safety into management and work practices at all levels so that the Site accomplishes its missions while protecting the public, the worker, and the environment. The ISMS execution comprises five functions: 1) defining scope of work, 2) analyzing hazards, 3) developing and implementing controls, 4) performing work, and 5) providing feedback and improvement. SRS implements ISO 14001 and accomplishes the EMS goals using the ISMS approach in programs and procedures. As Figure 2-1 shows, the ISO 14001 EMS approach, Plan-Do-Check-Act, is similar to ISMS, which allows SRS to integrate EMS into ISMS.

The EMS integrates environmental protection initiatives—such as identifying safety and health hazards, and the quality processes in place to manage them—into SRS daily operations. This linked approach to planning, executing, evaluating, and modifying ensures that SRS operates with minimal adverse impact on the environment.

SRS also uses the EMS as a platform to implement the Site Sustainability Plan (SSP), as well as carry out programs with environmental goals and objectives that contribute to SRS meeting its sustainability goals. SRS EMS and SSP goals and objectives, along with the status of the Site's progress toward meeting these goals, are available on the SRS website. These documents, combined with Site policies and procedures, ensure SRS remains a leader in protecting the environment and is a steward of conserving energy and water.

Each EMS must have a formal audit performed every three years by a qualified party outside the control or scope of the EMS. Savannah River Nuclear Solutions, LLC (SRNS); Savannah River Remediation LLC (SRR); and CB&I AREVA MOX Services, LLC conform to ISO 14001, and Centerra-SRS is registered to the ISO 14001 standard.

SRS contractors had the following audits for ISO 14001 compliance:

- SRNS and SRR had an external conformance audit in March 2018
- Centerra had an external reregistration audit in January 2018
- MOX Services had an external conformance audit in April 2016

As a result of these successful audits, SRNS and SRR were declared to be in conformance with the ISO 14001 standard. Likewise, Centerra was declared to be in conformance with the ISO 14001 standard following a successful reregistration audit. Since MOX Services had a conformance audit within the specified schedule, it did not need to have one in 2018.

2.1.2 Goals and Objectives

The Site uses the SSP to implement the sustainability goals outlined in DOE's Strategic Sustainability Performance Plan. The goals, which DOE sets annually for all sites, include the following:

- Reducing total energy use
- Increasing renewable energy use
- Reducing water use
- Purchasing environment-friendly, or "green," products and services
- Reducing solid waste generation
- Increasing the number of sustainable buildings
- Reducing fleet and petroleum use
- Using energy-compliant electronic devices

Sustainability Goals

Appendix A presents the sustainability goals as well as environmental compliance goals for 2018, identifies the related environmental objectives and strategies for implementation, and provides the status of SRS's progress toward achieving them. This chapter contains additional information on how SRS is moving forward in supporting DOE objectives.

2.2 SUSTAINABILITY ACCOMPLISHMENTS

The following topics summarize the major accomplishments the SSP discusses. Updated annually, the SSP outlines the strategies in place and the progress made toward accomplishing national goals related to improving energy, water and fuel efficiency, and using sustainable products and services DOE Order 436.1, Executive Order No. 13423, and the DOE Strategic Sustainability Performance Plan require. Executive Order No. 13693, *Planning for Federal Sustainability in the Next Decade*, outlines each of the topics below. Additionally, Appendix A of this document outlines the 2018 EMS goals and objectives related to sustainability.

2.2.1 Greenhouse Gas Reduction

By reducing greenhouse gas (GHG) by 78%, SRS has surpassed the 50% goal to reduce Scope 1 and 2 GHG emissions from a fiscal year (FY) 2008 baseline. Scope 1 GHG emissions consist of direct emissions from sources that DOE owns or controls, such as onsite combustion of fossil-fuels and fleet fuel consumption. Scope 2 GHG emissions consist of indirect emissions from sources that DOE owns or controls, such as emissions from generating electricity, heat, or steam DOE purchased from a utility provider. Scope 3 GHG emissions are from sources DOE does not own or directly control but are related to DOE activities such as employee travel and commuting.

The following inventoried sources at SRS currently generate Scope 1 and 2 emissions:

- Purchased electricity
- Wood (biomass)
- Fuel oil
- Propane
- Gasoline
- Diesel
- E85 (ethanol)
- Jet fuel
- Fugitive emissions

Biomass Cogeneration Facility

SRS continued to substantially reduce Scope 1 and 2 GHGs during FY 2018 due to the Biomass Cogeneration Facility and operating three additional biomass facilities, one each in A Area, L Area, and K Area. DOE tracks GHG data from various impact sources (such as Site energy use, alternative workplace arrangements and space optimization, and vehicle and equipment use). By 2025, DOE must reduce Scope 3 GHG emissions by 25% compared to the FY 2008 baseline. As of 2018, SRS has met that goal by reducing emissions 87%. The Site has accomplished this by such efforts as using webinars and conference calls to reduce business travel and by promoting employee carpooling.

2.2.2 Sustainable Buildings

Using FY 2015 as a baseline, by FY 2025 DOE must reduce by 25% the amount of energy per square foot (energy intensity) used in an identified class of buildings. DOE expects sites to aggressively strive toward the 25% reduction goal when it is cost-effective and prudent to do so. The annual goal is to reduce intensity by 2.5%. As of FY 2018, SRS has reduced its energy intensity by 19% from the FY 2015 baseline.

In FY 2018, SRS conducted many activities that reduced energy intensity. Operating the Biomass Cogeneration Facility had the most impact. The following are some additional notable accomplishments supporting this program:

- Conducted an energy study to identify the buildings that require energy and water audits under Section 432 of the Energy Independence and Security Act of 2007 (EISA)
- Removed 22 unoccupied and aging trailers, reducing energy consumption and reducing footprint
- Continued installing energy-efficient lighting, such as light-emitting diodes (LEDs), as existing fluorescent lighting failed in facilities
- Replaced 22 heating and cooling units with new higher Seasonal Energy Efficiency Ratio (SEER) units
- Replaced roofs on five buildings with cool roof technology, which uses light-colored tiles or shingles to reflect sunlight and heat, decreasing the need for air conditioning

EISA and Executive Order 13693 have been the drivers for many years in the ongoing effort to improve energy efficiency at the Site. Installing energy-efficient lighting, heating and cooling units with a higher SEER (a 2008 efficiency standard defined by the Air Conditioning, Heating, and Refrigeration Institute), and

cool roofs are the types of recommended actions EISA audits identified. SRNS conducted the 2018 energy study to ensure the appropriate facilities meet the energy-reduction goals under EISA. Energy efficiencies have come from a wide variety of strategies including the following:

- Upgrading utility systems
- Minimizing boiler use for winter heating
- Operating the Biomass Cogeneration Facility and the biomass steam plants in A Area, K Area, and L Area
- Deactivating and decommissioning many facilities, including entire areas (TNX), multiple buildings, land, and associated waste disposal areas
- Consolidating employee-occupied building space into fewer buildings
- Using more energy-efficient equipment in facilities (such as lighting timers, lighting sensors, and programmable thermostats)
- Upgrading various small-scale light fixtures to LEDs

SRNS also manages energy efficiency at a facility level through the Peak Alert process, which reduces purchased power. Actions that will reduce the demand for energy include raising the thermostat (summer), lowering the thermostat (winter), and turning off lights when it is safe to do so. SRS used Peak Alerts to manage 22 peak events during FY 2018: 8 during cool months and 14 during warm months.

2.2.3 Renewable Energy

Executive Order No. 13693, *Planning for Federal Sustainability in the Next Decade*, Clean Energy goal requires at least 25% of an agency's total electric and thermal energy come from renewable and alternative energy sources by FY 2025. Additionally, DOE's Renewable Electric Energy goal requires that renewable electric energy account for at least 30% of a total agency electric consumption by FY 2025. SRS has exceeded the clean energy generation goal by generating power from biomass. SRS no longer uses coal to generate energy. SRS meets the Renewable Electric Energy goal with 30% of overall facility electricity use coming from renewable energy in the form of biomass. Using clean and renewable energy at the Site is a high-level priority. The Biomass Cogeneration Facility is in its seventh year of fully operating and has played a significant role in supporting these renewable and alternative energy goals.

2.2.4 Water Use Efficiency and Management

Executive Order No. 13693, *Planning for Federal Sustainability in the Next Decade*, stipulates that by FY 2025, DOE as an agency will reduce the gallons of potable water used per square foot of building area (also known as potable water consumption intensity) by 36%, relative to a FY 2007 baseline. DOE had an FY 2018 target goal to reduce this ratio by 22%.

The Site has been significantly decreasing its potable water use over many years. In 1996, for example, the Site installed a new SRS primary domestic water system. The new system, along with replacing old and leaky piping, saved the Site several hundred million gallons of water annually. SRS also installed water meters on the main supply lines and periodically conducts a water balance to monitor use and help detect leaks.

Compared to the baseline (FY 2007), SRS has reduced potable water consumption intensity through FY 2018 by 17% and has not met the DOE FY 2018 target goal of 22%. The FY 2007 baseline does not account for potable water conservation efforts such as the new primary domestic water system installed prior to 2007. It will be more difficult for SRS to make future decreases to potable water usage since it has already achieved large decreases in the programs that have the biggest impact. Potable water use fluctuates from year-to-year based on various factors, such as the number of employees and the amount of potable water used for nonpotable purposes.

SRS has been using WaterSense® products and other water-conserving products, including low-flow toilet flush valves, low-flow urinal flush valves, and low-flow faucets. In recent years, the Site has replaced several hundred less-efficient faucets and flush valves with more-efficient low-flow units. In FY 2018, SRS continued that process.

DOE as an agency is also required to realize a 30% water consumption reduction of industrial, landscaping, and agricultural (ILA) water by FY 2025 relative to the FY 2010 baseline. SRS has an FY 2018 interim target goal of 16% reduction. SRS's ILA water usage has decreased 43.9% as of FY 2018 as compared to the FY 2010 baseline. Long-term reductions in ILA water have been achieved due to the biomass facility operating, which consumes significantly less water than the prior coal-fired power plant.

2.2.5 Fleet Management

The primary goal for DOE fleet management is to use less petroleum and more alternative fuel, as Figure 2-2 demonstrates. SRS has met and exceeded these goals since FY 2000. Figure 2-3 shows SRS FY 2018 performance in meeting key fleet management goals.

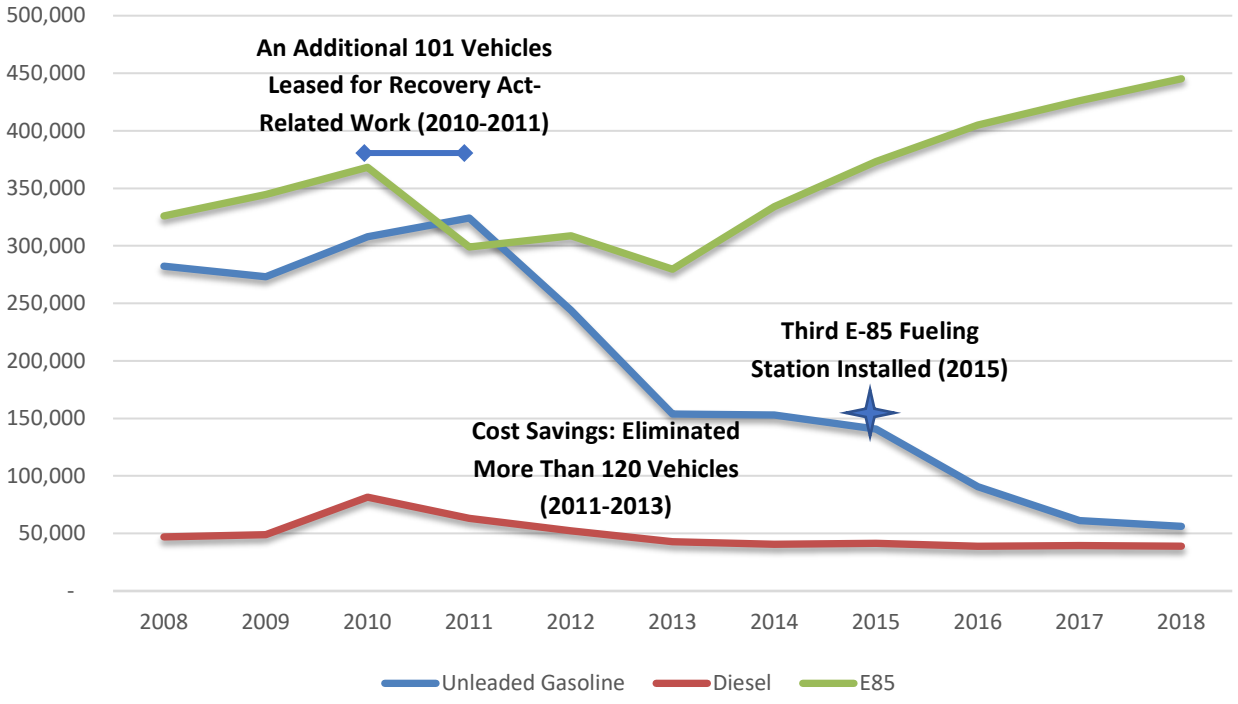

Figure 2-2 GSA Fuel Consumption by Type, FY 2008 to FY 2018

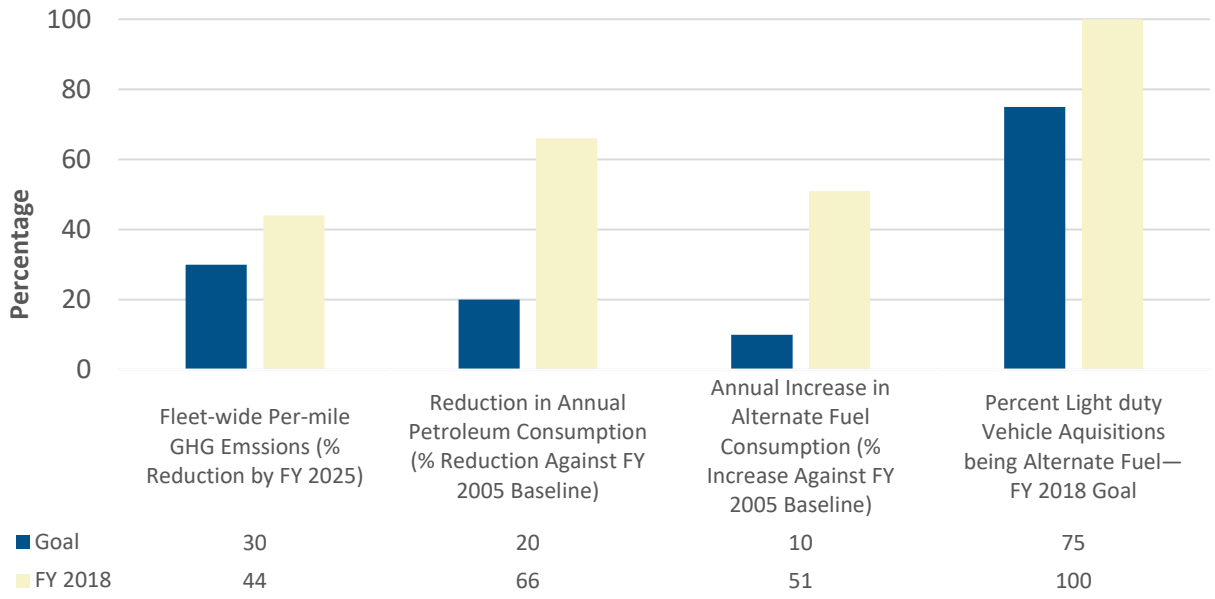

Figure 2-3 SRS Performance in Meeting Fleet Management and Transportation Goals

SRS installed two E85 fueling stations in October 1999 and added a third in FY 2015. In FY 1999, the year prior to installing the fueling stations, the Site consumed more than 700,000 gallons of unleaded gasoline and no E85 alternative fuel. In FY 2018, the Site consumed approximately 56,000 gallons of unleaded gasoline, 39,000 gallons of diesel fuel, and 445,000 gallons of E85 alternative fuel. SRS has reduced its fleet-wide per mile greenhouse gas emissions goal by 44%, exceeding the Executive Order No. 13693, *Planning for Federal Sustainability in the Next Decade*, goal of a 30% reduction by FY 2025. In FY 2018, SRS exceeded the goal of annually maintaining a 20% reduction of petroleum use and a 10% increase in alternative fuel compared to the FY 2005 baseline with a 66% reduction in petroleum and a 51% increase in alternative fuel, respectively.

SRS continues to implement the Site Vehicle Allocation Methodology Plan completed in 2016. The Vehicle Allocation Methodology helps organizations eliminate fleet vehicles that are unnecessary, oversized, or not fuel-efficient. SRS updates its plan at least every five years. In FY 2018, SRS leased 94 new light-duty vehicles, all of which used E-85 alternative fuel, and increased the number of vehicles in the light duty fleet that are either E-85, hybrid, or electric to 546 (98.6%), out of an approximately 552-vehicle fleet. This acquisition of 100% alternative fuel vehicles in FY 2018 exceeded the goal of 75% of the vehicles using alternative fuel. Of the passenger vehicles that are unleaded vehicles, 74% are hybrid fuel and electric vehicles, which exceeds the FY 2025 Executive Order No. 13693, *Planning for Federal Sustainability in the Next Decade*, goal of having 50% of the passenger vehicle acquisitions being zero emission or plug-in hybrid electric vehicles.

2.2.6 Sustainable Acquisition

SRS Procurement has established sustainable practices related to purchasing environmentally preferable products (EPP) to meet the DOE goal of 95% of new contract actions for products and services are to meet sustainability acquisition requirements. The EPP procurements have led to several practices, as outlined below:

- The SRS Chemical Management Center reviews and approves chemical acquisitions. This review monitors using hazardous chemicals and, where appropriate, recommends EPPs.
- Electronic stewardship has led to procuring and leasing desktops, laptops, and monitors that meet Electronic Product Environmental Assessment Tool (EPEAT) standards and copiers that are ENERGY STAR®-compliant.
- EPP substitutions have been procured under various new and existing contracts, including bulk janitorial supplies (for example, cleaners, paper products) and safety items (for example, earplugs, filters).

SRS implemented a system to monitor and track EPP procurements. This new business system will enable SRS to develop an EPP baseline and track spending on EPP items and materials.

For FY 2018, SRS procurement reviewed 96,353 purchase order line descriptions to determine if the product meets the U.S. Department of Agriculture's (USDA's) definition of BioPreferred®. However, the product information available was not adequate to effectively determine bio-based content as described in the USDA biobased-preferred catalog.

2.2.7 Pollution Prevention and Waste Reduction

In accordance with the Pollution Prevention Act of 1990, SRS's primary objective is to prevent or reduce pollution at the source whenever practical. Environmentally safe and cost-effective reuse or recycling will divert pollutants and wastes that source reduction cannot prevent from entering the waste stream. Pollution prevention is the SRS preferred approach to reducing waste, mitigating health risks, and protecting the environment. The Pollution Prevention Program provides SRS a safe, effective, and environmentally responsible strategy to implement specific waste-reduction techniques based on current and projected information on waste generation, waste characteristics, and costs associated with managing waste. Pollution prevention is a key component of the SRS EMS.

The goal for FY 2018 was to divert at least 50% of nonhazardous solid waste, excluding construction and demolition debris, for recycling or reuse. SRS uses the North Augusta Material Recovery Facility (NA-MRF) for typical office and municipal-type waste recycling and another vendor to shred and recycle sensitive office paper. In FY 2018, SRS recycled about 58% of this stream, 504 metric tons of the 872 metric tons of waste that it shipped. Table 2-1 provides a breakdown of recycled amounts from key items in the onsite program.

SRS continues to work with NA-MRF to improve the process to attain and improve upon a 50% recovery rate. In addition, SRS uses NA-MRF to recycle most of the waste from its area cafeterias and building kitchenettes. The Site segregates the main cafeteria's waste due to there being very little material suitable for recycling or composting. SRS continues to monitor this waste stream for opportunities to recycle materials. In FY 2018, SRS successfully implemented concrete and asphalt recovery, recycling more than 21,360 metric tons of rubble from scraping and paving a major road onsite. The Site otherwise would have

Table 2-1 SRNS Recycling and Sustainability in FY 2018 by Amount

Items Recycled Onsite in FY 2018	Amount Recycled
Silver Fixative	75 gallons
Batteries (nickel-cadmium, lithium-ion, mercury)	10,071 pounds
Lead Salvage	0 pounds
Light Bulbs/Mercury-containing Equipment	10,282 pounds
Batteries (lead acid)	99,540 pounds
Furniture	203,720 pounds
Scrap Metal	675,540 pounds
Used Tires	8,000 pounds

Note:
SRS also recycles brass casings that the Site security contractor generates during security activities.

treated the rubble as waste and sent it to the on-site construction and demolition landfill. SRS will use some of this recovered material for beneficial reuse both onsite to improve secondary roads and offsite in nearby Orangeburg, South Carolina, where the Savannah River Site Community Reuse Organization (SRSCRO) will direct more than 13,000 metric tons**.**

2.2.8 Energy Saving Perfomance Contracting

SRS has used Energy Saving Performance Contracting (ESPC) to engage Ameresco Federal Solutions in several projects that conserve energy and water. ESPC funds energy- and water-saving building improvements with future energy savings. Ameresco Federal Solutions, tasked with the DOE's largest-ever ESPC project, operates the Biomass Cogeneration Facility located on SRS. This facility produces steam and electricity on a 24-hour, full-time basis.

The ESPC scope included the following in 2018:

- Ameresco continued operating the Biomass Cogeneration Facility, which includes three biomass boilers for steam and electricity
- Ameresco also operated steam-only biomass plants for heating buildings in two areas at SRS

2.2.9 Electronics Stewardship

SRS is implementing many electronics stewardship strategies to reduce energy use and waste, and their associated costs. In FY 2018, SRS continued exemplary performance and met sustainable electronics purchasing and disposal goals. SRS purchased EPEAT and registered ENERGY STAR®-qualified products for all eligible laptops, desktops, and monitors. Ninety-seven percent of the eligible electronics SRS acquires meet EPEAT standards. All eligible computers and imaging equipment are set up to automatically print on both sides of paper. Likewise, 100% of eligible desktops, laptops, and monitors have power management enabled. Used electronics are either recycled or reused in an environmentally sound manner by donating to schools and nonprofit organizations or by recycling through authorized recycling

companies. In FY 2018, SRS recycled 50,290 pounds of scrap electronics. SRS is also extending the "workstation refresh cycle"—the time a computer is used before being replaced—reducing the number of computers being retired and the amount of scrap electronics being generated.

2.2.10 Climate Change Resilience

SRS ensures that federal operations and facilities can continue to protect and serve citizens in a changing climate. SRS uses global climate model projections and data as the starting point to assess the impact of climate change to Site buildings and outdoor workers. SRS continues to assess the effects of climate change on preserving forests, maintaining water levels in Site ponds and lakes, and the ability of a Site energy plant to "dump" heat to the environment.

2.3 EMS BEST PRACTICES

2.3.1 South Carolina Environmental Excellence Program (SCEEP)

In 2018, CB&I AREVA MOX Services maintained its membership in SCEEP. Membership is active for three years. The South Carolina Department of Health and Environmental Control (SCDHEC) has recognized MOX Services for its membership in the SCEEP since 2011. SCEEP is a voluntary SCDHEC program that recognizes South Carolina facilities that demonstrate excellence in environmental performance through pollution prevention, energy and resource conservation, and continued efforts in environmental improvement.

2.3.2 Sustainability Campaign

SRS continued to implement its "One Simple Act of Green" environmental awareness campaign. The program empowers SRS employees with the information, tools, and programs needed to reduce the Site's footprint on the environment. Employees practice simple acts, such as turning off lights when leaving a room or workspace, which promote environmental stewardship.

MOX Services TEEM (Targeting Environmental Excellence at MOX) is an elite group of MOX employees selected by their peers whose members volunteer their time to identify ways to reduce MOX's environmental footprint. TEEM championed two sustainability campaigns in 2018:

- Last Out Lights Out—MOX reduced its electricity consumption by 3% over the past 4 years. This campaign curbed wasteful electricity use by deploying "lights out" messages in MOX facilities.
- Call for Awareness—MOX obtained the top five slogans, posters, and quotes on reducing MOX's environmental footprint. This campaign encouraged employees to participate in spreading awareness through compelling visuals that better grab people's attention on environmental stewardship, one of MOX's core values.

2.3.3 Earth Day

SRS hosted an Earth Day celebration onsite for its employees on April 19 with approximately 600 employees attending. The theme was "Earth Day 2018…naturally" and focused on natural solutions to

everyday issues and situations. The exposition-format event included exhibits on animals and nature, pesticides, the importance of pollinators, environmental monitoring techniques, solar power use, and sustainable environmental remediation. There was broad participation from organizations internal to SRS (for example, CB&I AREVA MOX Services, Savannah River Remediation, Savannah River Ecology Laboratory, U.S. Department of Agriculture [USDA] Forest Service-Savannah River) and external to SRS (for example, South Carolina Department of Health and Environmental Control, the Aiken Beekeepers, Lexington Beekeepers, and the Clemson Cooperative Extension).

DOE's Jolene Seitz, Maatsi Ndingwan, and Avery Hammett at the SRNL Booth on 3-D Printing

Clemson Cooperative Extension Sharing Information on Pesticides

2.3.4 Reuse or Recycling of Equipment and Materials

SRS is partnering with SRSCRO to turn excess equipment and material into money to benefit the counties of Aiken, Allendale, and Barnwell in South Carolina and Richmond and Columbia counties in Georgia. Surplus material includes the following:

- Small items such as office equipment, valves, and glassware for laboratory experiments
- Large items of potentially much greater value such as electrical turbines, diesel powered pumps, and fire engines
- Tons of metal

SRSCRO is the interface organization that takes in items that the Site no longer needs. The SRSCRO sells these items and uses the proceeds for the economic good of numerous businesses throughout the large region surrounding SRS. In FY 2018, SRS shipped $8.1 million in usable assets for reuse and recovery. Based on SRSCRO's 2018 annual report, the program facilitated by this partnership generated $278,243 in gross revenue during the fiscal year.

2.3.5 Sustainable Environmental Compliance and Environmental Remediation

SRS continues to excel in various sustainable remediation activities. Of the 36 remediation systems currently operating, 18 are completely passive, requiring no energy to implement, and 12 are low energy systems. These low-energy systems use sustainable technologies (such as solar-powered MicroBlowers and barometric-pressure-driven Baroballs) to pump volatile organic contaminants from the subsurface, thus reducing contamination. SRS is also using the Hydrasleeve sampling methodology for more than 230 wells, which eliminates managing purge water as waste.

Drones Save on Fuel Usage

SRS implemented innovative methods to address environmental compliance, improve worker safety, and increase productivity. These included

- Deploying oyster shells upstream of industrial stormwater outfalls to treat industrial stormwater for zinc and copper
- Testing video-enabled drones for surveying decommissioned reactor building roofs (versus helicopters and a photographer)
- Deploying remotely operated wireless stormwater sampling equipment to comply with the conditions of the Industrial Stormwater General Permit (the sample must be collected within the first 30 minutes of initial discharge from a measurable storm event)

Utilizing remotely operated devices (drones and wireless equipment) decreases use of vehicles, thereby saving fuel usage supporting fleet management goals.

SRS Uses Oyster Shells to Treat Stormwater

A MicroBlower Pumps Volatile Organic Contaminants from the Subsurface

2.3.6 Challenges and Barriers to Implementation

In 2018, SRS continued to make progress conserving and managing resources to meet the sustainability goals in the Site Sustainability plan. However, aging infrastructure continually poses challenges with initiating sustainable projects. Achieving new goals is becoming significantly difficult with the high cost of implementing sustainability upgrades at SRS's many aging facilities (for example, administrative, shops, laboratories, warehouses). As discussed in Section 2.2.4, SRS significantly decreased potable water use in 1996 when it installed a more-efficient primary domestic water system. SRS is below 2018 interim targets for reducing potable water intensity (17% versus a goal of 22%) when comparing water conservation measures to the baseline year (FY 2007). SRS reduces potable water use with the ongoing installation of water-efficient toilet systems when repairs are needed. However, site-wide retrofitting with low-flow flush valves and faucets is not cost effective. Likewise, sustainability efforts related to energy management will require additional guidance as SRS works to complete EISA audits for site infrastructure with limited resources and competing priorities.

In 2018, SRS identified program challenges with the implementation of the 2015 ISO 14001 EMS standard. The 2018 EMS Triennial Audit identified an opportunity for improving leadership engagement in the EMS program. An internal assessment conducted later in the year reiterated the need to improve leadership engagement including communicating the importance of EMS to all personnel and integrating EMS policy into daily work practices and into a tangible metric for accountability. While SRS successfully implemented the latest version (2015) of the ISO 14001 standard, implementing the sustainability initiatives, using this standard has been challenging.

SRS continues to consider green or sustainable technologies or initiatives to facilitate the Site's environmental compliance. Under the Industrial stormwater program, SRS is pursuing the use of oyster shells to mitigate copper levels in industrial stormwater. Upon deployment, this treatment is very effective for zinc; however, the oyster shells are not as effective for copper. To ensure effective treatment for copper, SRS continues to evaluate different factors to optimize this treatment approach.