


SANDIA NATIONAL LABORATORIES

2022

ANNUAL SITE
ENVIRONMENTAL **SUMMARY** REPORT

LIVERMORE, CALIFORNIA



DOE and Sandia are committed to ***safeguarding the environment, assessing sustainability practices, and ensuring the validity and accuracy of the monitoring data*** presented in this summary of the 2022 SNL/CA annual site environmental report.

Sandia National Laboratories is a multimission laboratory managed and operated by National Technology & Engineering Solutions of Sandia, LLC, a wholly owned subsidiary of Honeywell International Inc., for the U.S. Department of Energy's National Nuclear Security Administration. This report summarizes the environmental protection and monitoring programs in place at Sandia National Laboratories, Livermore, California (SNL/CA) during calendar year 2022. This publication is approved for unlimited public release by Sandia National Laboratories.

Detailed information can be found in the full annual site environmental report accessed via the QR code.





Aerial View of Sandia's Livermore, California Campus by Randy Wong

ENVIRONMENTAL MANAGEMENT SYSTEM

A robust environmental management system ensures a structured approach to identifying environmental aspects, setting environmental objectives, and monitoring environmental performance. Sandia's Environmental Management System is ISO 14001:2015 certified at the New Mexico and California sites. Sandia personnel follow the system's requirements, as verified by an external, third-party audit in 2022. This environmental management system is Sandia's primary platform for implementing the environmental management programs that help achieve annual site sustainability goals.

For fiscal year 2022, the significant aspects identified for SNL/CA operations were air emissions – greenhouse gases and hazardous air pollutants (asbestos); hazardous materials; hazardous, mixed, and radiologic waste; water use; and release of petroleum to soil, surface, and groundwater.

Sandia management takes environmental stewardship seriously.





Foxes Outside Building 960 by Danielle Oteri

Sandia defines sustainability practices and goals in a site sustainability plan. The annual site sustainability plan provides a roll-up of sustainability data from all primary Sandia sites including SNL/CA.

Highlights for 2022 for Sandia's sustainability performance that apply to SNL/CA include energy intensity which decreased by 4.2% from fiscal year 2021 to fiscal year 2022. In addition, SNL/CA personnel managed electronics stewardship, with 91.1 percent of acquisitions meeting environmentally sustainable electronics standards, 100 percent of operations using power management features during computer and monitor use, and 100 percent of end-of-life equipment being disposed of through government programs or certified recyclers.

SITE SUSTAINABILITY





Windmills in Livermore, California

ENVIRONMENTAL PERFORMANCE

During the most recent DOE evaluation,
Sandia earned an overall rating of very good.

DOE assesses environmental management for the operation through the review of site monitoring data and various site environmental reports; which collectively indicate the overall performance of the laboratory.


During **2022**, there was one DOE-reportable occurrence that met the criteria for reporting in the annual site environmental report.

- Pacific Missile Range Facility Project Causes Ecological Impact To Endangered Hawaiian Ducks (NA--SS-SNL-8000-2022-00070)

More information on this occurrence can be found in the full annual site environmental report.

All environmental monitoring in 2022 was conducted in accordance with program-specific plans that contain applicable quality assurance elements and meet appropriate federal, state, and local requirements for conducting sampling and analysis activities.





In April 2022 the BAAQMD
conducted their annual
inspection. No violations were
identified during the inspection.

AIR QUALITY COMPLIANCE PROGRAM

Air Quality Program personnel support compliance with air quality regulations, permits, and other requirements. In Alameda County, California, the Bay Area Air Quality Management District (BAAQMD) is the local regulatory authority that implements air quality regulations and standards established by the Environmental Protection Agency and the California Air Resources Board.

2022 Program activities and results:

There are no major sources of air pollutants (as defined in 40 CFR 70.2) present at SNL/CA. Air Quality Program personnel work with the BAAQMD and California Air Resources Board to permit or register all regulated emission sources. In 2022 there were nine permitted sources and nine registered sources.

There are no radionuclide emission sources at SNL/CA that are subject to 40 CFR 61 monitoring requirements. To comply with national emission standards, individual projects with the potential to release radionuclide emissions are evaluated to determine the worst-case dose to the public. Additionally, dose calculations are compared to the standards to determine the need for annual monitoring. During 2022, no projects emitted any radionuclides into the ambient air; consequently, no annual effluent monitoring and no National Emission Standards for Hazardous Air Pollutant evaluations were completed.

Chinese Maple by Robert Holland



Vineyard in Livermore California

CHEMICAL MANAGEMENT PROGRAM

The Chemical Management Program relies on the Chemical Information System which is a comprehensive chemical information tool used to track workplace chemical and biological containers by location. The primary drivers for the Chemical Information System are state and federal regulations, including the Emergency Planning and Community Right-to-Know Act (EPCRA). To meet EPCRA requirements applicable to SNL/CA operations, an annual report is submitted online to the Livermore-Pleasanton Fire Department through the California Environmental Reporting System. In addition, state regulations require SNL/CA personnel to establish, implement, and maintain a business plan for emergency response in the case of a release or threatened release of a hazardous material.

SNL/CA personnel use the Chemical Information System to track and manage chemicals; the system provides the chemical or product name, its location and quantity, and information about who is responsible for the chemical. This electronic inventory helps chemical users, and their managers assess and manage workplace hazards. Easy access to this inventory facilitates availability searches. It also improves the ability to share chemicals and thus reduces sources, which minimizes chemical purchases and waste disposal expenses.

2022 Program activities and results:

In 2022, Chemical Management Program personnel counted and verified the number of hazardous materials containers in inventory. Inventory results are used to encourage chemical owners to right-size inventories and minimize the use of higher-toxicity materials through chemical exchange or reduction.

In October 2022 Livermore-Pleasanton Fire Department (Certified Unified Programs Agencies) conducted their annual inspection of the site's Hazardous Materials Business Plan. One minor violation was identified for gas storage cylinders that were not properly restrained. The violation was corrected during the inspection.





Combustion Research Facility SNL/CA

CULTURAL RESOURCE MANAGEMENT WITHIN THE ENVIRONMENTAL PLANNING PROGRAM

The Cultural Resource Management Program is focused primarily on long-term preservation and protection of cultural resources and cultural resource compliance to ensure that the heritage of Sandia operating areas and their landscapes are maintained. Long-term preservation and protection also ensure that data are available to make proper land use decisions and to assist with environmental planning. The Cultural Resource Management Program is focused on two main cultural resource categories: archaeological resources and historic buildings.

2022 Program activities and results:

No archaeological resources have been identified at SNL/CA. No structures at SNL/CA have been identified as historically significant and none have been determined to be eligible for the National Register (SNL 2002). The Cold War is the dominant historical context for nearly all of Sandia's history. In 2022, the built environment at SNL/CA was surveyed and is currently being reassessed.





Ecology Program personnel surveil vegetation and wildlife to support site operations. Ecological compliance promotes conservation through the protection of native wildlife and their habitats. Conducting routine monitoring activities promotes an understanding of local population dynamics and temporal shifts through time. This knowledge is important for local land use.

ECOLOGY PROGRAM

Swainson's Hawk



Sandia California site

Birds

During 2022, personnel monitored a pair of Swainson's hawks (State threatened) that were confirmed to be nesting in the same nest they used at SNL/CA in 2021. Building and site construction activities were halted or modified to allow the hawks to return to an undisturbed site. The pair laid two eggs that hatched, but the nest ultimately failed. After it was confirmed that nesting activity had ended and the nest was determined to be inactive, nest monitoring ceased.

Amphibians

In 2022, California red-legged frogs (listed as threatened under the federal Endangered Species Act and as a species of special concern under the California Endangered Species Act) were observed on-site during a dip net survey, which is using a mesh net to scoop through water to sample for amphibians such as frogs. The survey was conducted by contracted biologists and SNL/CA personnel. One tadpole and two metamorphs were found in shallow water in the Arroyo Seco.

Wildlife Response

Sandia personnel use a web-based ticketing system, Eco Ticket, for the site to report wildlife issues and concerns. In 2022, twenty-three requests were received through Eco Ticket for SNL/CA. Snake requests were requested most often with six tickets, none of which were for venomous snakes; the "Other" category was requested at a close second with five tickets, several of which were redirected to Facilities personnel for pest control help.

ECOLOGY PROGRAM
(CONTINUED)





Turkey Vultures on Groundwater Wells by Robert Holland

GROUNDWATER MANAGEMENT WITHIN THE ENVIRONMENTAL MONITORING PROGRAM

There are seven groundwater monitoring wells at SNL/CA. Environmental Monitoring Program personnel monitor the groundwater at two former restoration areas and along the Arroyo Seco. Three groundwater monitoring wells are used to monitor residual contamination at former restoration areas under a 1989 site cleanup order issued by the Regional Water Quality Control Board, San Francisco Bay Region. Two of these wells are located at the Fuel Oil Spill site and one is at the Navy Landfill. The other four monitoring wells are located along the Arroyo Seco to monitor the effect of site operations on groundwater quality. The wells are monitored at different sampling schedules.


2022 Program activities and results:

The Fuel Oil Spill site wells were sampled during the first and third quarter of the calendar year 2022. No diesel was detected.

The Navy Landfill well was sampled in May 2022. As in past years, sample results continued to show carbon tetrachloride. The presence of carbon tetrachloride in this well has been noted since well completion. The California State Water Resources Control Board requires this well continue to be monitored for carbon tetrachloride though the Navy Landfill is considered a closed site. It should be noted that the Navy Landfill well does not draw water from drinking water or an irrigation aquifer.

The Arroyo Seco wells were sampled in May 2022. The sample results for all the parameters were below the state and federal maximum contaminant levels.





California Poppy

NATIONAL ENVIRONMENTAL POLICY ACT WITHIN THE ENVIRONMENTAL PLANNING PROGRAM

Environmental Planning Program personnel provide technical assistance to ensure that Sandia operations and activities are reviewed for NEPA compliance at all Sandia locations. For all proposed projects and activities, project owners must complete a NEPA checklist using the online NEPA Module application. A NEPA checklist is an internal form that Environmental Planning Program personnel use to review projects and proposed activities for compliance with NEPA. After reviewing a NEPA Checklist, Program personnel determine whether proposed projects and activities have been evaluated in existing NEPA documentation. In addition, other relevant environmental program subject matter experts review proposed work to identify and communicate any applicable environmental permitting and/or other requirements to project managers. Project managers are required to ensure that all environmental requirements are met.

2022 Program activities and results:

In 2022, Environmental Planning Program personnel reviewed 72 NEPA checklists covering activities managed by SNL/CA.

Each year, Environmental Planning Program personnel compare actual site operations to the maximum operations scenarios presented in the 2003 DOE site-wide environmental assessment and a supplement analysis completed in 2012 to determine whether SNL/CA operations remain within the envelope of the environmental impact analysis. The full annual site environmental report presents a summary of the 2022 comparison and an evaluation of the results.



Fueling Station at SNL/CA

OIL STORAGE PROGRAM

Oil Storage Program personnel support regulatory compliance associated with the management, operation, and maintenance of oil storage containers and equipment at SNL/CA. Aboveground oil storage containers at SNL/CA operate under the *SNL/CA Spill Prevention, Control, and Countermeasure Plan* as required by 40 CFR 112, *Oil Pollution Prevention* and the state regulations CA Health and Safety Code, Division 20, Chapter 6.67 (20 HSC 6.67) *Aboveground Storage of Petroleum*.

2022 Program activities and results:

In 2022, the oil storage capacity at SNL/CA was approximately 12,206 gallons. The inventory of oil storage containers operating under the SNL/CA spill prevention control and countermeasure plan included bulk storage containers and oil-filled operation equipment containers. The bulk storage containers included fixed, portable, and mobile containers. The oil-filled operational equipment containers were associated with electrical, hydraulic, and metal machining equipment. SNL/CA oil storage container capacities range from 55 gallons to 1,000 gallons. No underground oil storage tanks are present at SNL/CA. All oil storage locations with regulated containers are equipped with passive and/or active secondary containment. There were no reportable oil spills in 2022.

In October 2022 Livermore-Pleasanton Fire Department (Certified Unified Programs Agencies) conducted their annual inspection of the site's oil storage areas. No violations were identified during the inspection.





Canada Goose on Nest

SNL/CA's Pollution Prevention and Waste Minimization Program helps reduce the amount and toxicity of waste streams generated at SNL/CA. Program personnel educate and track compliance with federal, state and local regulations including procuring products that meet various environmental specifications such as biobased and recycled content, and energy and water efficiency standards. Program personnel also ensure participation in recycling efforts to meet state and local regulations.

2022 Program activities and results:

For sustainable acquisition in 2022, the Ecomedes tool was introduced so that Sandia Designated Representatives as well as construction subcontractors can use it to maintain compliance with contractual requirements for sustainable product purchasing and reporting. For solid waste recycling in 2022, SNL/CA personnel diverted 71 percent of nonhazardous solid waste from treatment and disposal facilities and diverted 96 percent of construction and demolition waste from treatment and disposal facilities.

POLLUTION PREVENTION AND WASTE MINIMIZATION PROGRAM





Weapons Exhibit in Building 915 by Dino Vournas

RADIATION PROTECTION PROGRAM

Radiation Protection Program personnel maintain an inventory of radioactive isotopes (small-quantity sealed and unsealed sources) and operate several radiation-generating devices. Emission monitoring is not required for these materials and devices.

Radiation Protection Program personnel monitor gamma radiation to ensure that site operations are not significantly contributing to the ambient radiation dose in the surrounding environment. Ten perimeter monitoring stations, two background monitoring stations, and one on-site monitoring station are equipped with optically stimulated luminescent dosimeters and maintained at SNL/CA. The dosimeters are collected and evaluated quarterly.

2022 Program activities and results:

In 2022, the annual average background dose was measured at 39.31 mrem. The average annual perimeter dose was measured at 42.8 mrem. The average annual dose for the San Francisco Bay Area is estimated to be 43.8 mrem.





Three construction projects were ongoing through 2022. Each of the construction projects met the requirements defined in the applicable Construction General Permit.

Arroyo Seco by Robert Holland

STORMWATER MANAGEMENT WITHIN THE ENVIRONMENTAL MONITORING PROGRAM

All industrial stormwater runoff at SNL/CA is conveyed to the Arroyo Seco, which discharges into Alameda Creek and eventually to the San Francisco Bay. Environmental Monitoring Program personnel implement both the state of California National Pollutant Discharge Elimination System General Permit for Stormwater Discharges Associated with Industrial Activities as well as the state of California General Permit for Stormwater Discharges Associated with Construction and Land Disturbance Activities.

To assess the impact of site operations on stormwater discharges, two sampling locations and 20 outfall locations were identified that provide the best representation of drainage areas and activities on-site. Per the state of California's 2014 Industrial General Permit, Environmental Monitoring Program personnel are required to sample four qualifying storm events during the year at each representative location, twice during each half of the year. However, storm events may not produce enough runoff to collect samples at both sampling locations or may not fit the criteria of a qualifying storm event to deem sampling necessary.

2022 Program activities and results:

During the 2022 stormwater reporting year (July 1, 2021, through June 30, 2022), Environmental Monitoring Program personnel sampled both sampling locations. However, due to lower-than-normal rainfall and the timing of storms, there were only three qualifying storm events. The samples taken for this reporting year exceeded the average annual numeric action limit (NAL) concentrations of iron and aluminum. There was also an exceedance of the instantaneous NAL for pH for the reporting year. These exceedances and corrective best management practices were addressed in the exceedance response action Level 2 technical report that was submitted to the California State Water Resources Control Board in July 2022.





Female Fox at SNL/CA by Danielle Oteri

Waste Management Program personnel are responsible for managing hazardous, radioactive, and mixed wastes generated by SNL/CA operations. Program personnel collect these wastes from the point of generation and transfer them to on-site waste storage facilities. The wastes are prepared for shipment to offsite recycling, treatment, and/or disposal facilities.

2022 Program activities and results:

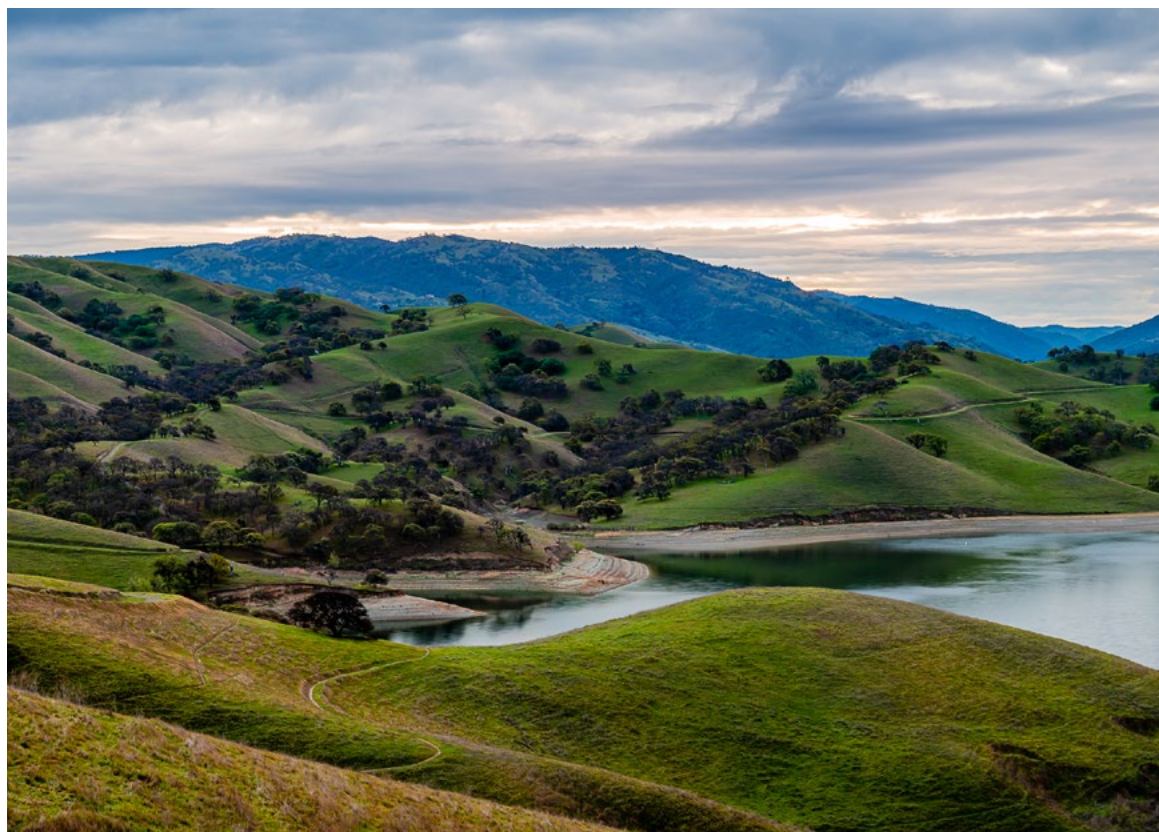
In 2022, 99,486 lbs of hazardous waste was generated and shipped; 61 lbs of low level radioactive waste was generated but not shipped; and no mixed low level radioactive waste was generated.

In October 2022, the Livermore-Pleasanton Fire Department (Certified Unified Programs Agencies) conducted their annual inspection of the site's hazardous waste accumulation areas. No violations were identified during the inspection.

In November 2022, the California EPA Department of Toxic Substances Control conducted their annual inspection of the Hazardous Waste Facilities. No violations were identified during the inspection.

WASTE MANAGEMENT PROGRAM





Sunrise over the Del Valle Regional Park in Livermore, CA

WASTEWATER MANAGEMENT WITHIN THE ENVIRONMENTAL MONITORING PROGRAM

Wastewater effluent generated at SNL/CA consists of sanitary and laboratory discharges. Sanitary effluent is discharged directly to the sewer system. Sewer discharges exit the site through a sewer outfall located at the northern boundary and join with the Lawrence Livermore National Laboratory (LLNL) sewer system which is discharged to the City of Livermore Water Reclamation Plant, a publicly owned treatment works. Laboratory discharges are generated from general research activities and from operations that qualify as categorical processes subject to federal pretreatment standards. Laboratory effluent from most laboratory areas is diverted to liquid effluent containment system holding tanks prior to discharge to the sanitary sewer. Environmental Monitoring Program personnel monitor and sample wastewater at the sewer outfall, the liquid effluent containment system tanks, and categorical process point sources to ensure permit compliance.

2022 Program activities and results:

SNL/CA met all the City of Livermore's wastewater permit requirements and discharge pollutant limits for 2022.

In October 2022, the City of Livermore, Water Resources Division performed their annual inspection of the three categorical processes and the wastewater discharge at the sewer outfall. No issues or violations were identified during the inspection.





Delta to San Francisco Bay California

WATER QUALITY AND PROTECTION WITHIN THE ENVIRONMENTAL MONITORING PROGRAM

SNL/CA operations are subject to the requirements of the Clean Water Act (33 USC § 1251 et seq.) and equivalent California statutes. There is no public water system at SNL/CA and no environmental restoration activities for which Safe Drinking Water Act standards are being applied. Potable water for SNL/CA is purchased from LLNL and obtained from the San Francisco Public Utilities Commission but can be supplemented by the Alameda County Flood Control and Water Conservation District (known as Zone 7) as a backup source. The San Francisco Public Utilities Commission and Zone 7 are responsible for monitoring the quality of the incoming water at LLNL. From there, LLNL personnel maintain the primary drinking water distribution system that feeds to SNL/CA and screen for water quality.

2022 Program activities and results:

LLNL personnel meter water use at SNL/CA as the water enters the site. In 2022, it was estimated that 36.3 million gallons of water were used at SNL/CA, a decrease of 0.38 million gallons from the water used in 2021. The site discharged approximately 5.5 million gallons of wastewater during 2022. Water loss, or the difference between water use and wastewater discharge, is attributed to activities such as irrigation, cooling towers, evaporative losses, eyewash and safety shower testing, construction and site maintenance activities, and fire system testing.





Sandia National Laboratories



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