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SAND2022-10687 O
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H A W A I ' I

KAUA'I

ANNUAL SITE ENVIRONMENTAL REPORT

2021

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U.S. DEPARTMENT OF ENERGY

NNSA

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United States Department of Energy, National Nuclear Security Administration,
Sandia Field Office, Albuquerque, New Mexico

2021 Annual Site Environmental Report
for Sandia National Laboratories, Kaua‘i Test Facility, Hawai‘i

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for
U.S. Department of Energy
National Nuclear Security Administration
Sandia Field Office

Abstract

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. The National Nuclear Security Administration's Sandia Field Office administers the contract and oversees contractor operations at Sandia National Laboratories, Kaua‘i Test Facility in Hawai‘i. Activities at the site are conducted in support of U.S. Department of Energy weapons programs, and the site has operated as a rocket preparation launching and tracking facility since 1962.

The U.S. Department of Energy and its management and operating contractor are committed to safeguarding the environment, assessing sustainability practices, and ensuring the validity and accuracy of the monitoring data presented in this Annual Site Environmental Report. This report summarizes the environmental protection, restoration, and monitoring programs in place at Sandia National Laboratories, Kaua‘i Test Facility during calendar year 2021. Environmental topics include air quality, ecology, environmental restoration, oil storage, site sustainability, terrestrial surveillance, waste management, water quality, and implementation of the National Environmental Policy Act. This report is prepared in accordance with and as required by DOE O 231.1B, Admin Change 1, *Environment, Safety and Health Reporting*, and has been approved for public distribution.

Acknowledgments

The following individuals provided their time and expertise to support production of this annual report for Sandia National Laboratories, Kauaʻi Test Facility, Hawaiʻi:

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Note to the Reader

This Annual Site Environmental Report for Sandia National Laboratories, Kauaʻi Test Facility, Hawaiʻi, presents summary data regarding environmental performance and compliance with environmental standards and requirements. In addition, the U.S. Department of Energy views this document as a valuable tool for maintaining a dialogue with the community about the environmental health of these sites and a commitment to protect our nation's valuable resources. With the goal of continually improving the quality of this annual report and including information that is important to you, you are invited to provide feedback, comments, or questions to:

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The Sandia National Laboratories, Kauaʻi Test Facility, Hawaiʻi, Annual Site Environmental Report can be found at the following website:
http://www.sandia.gov/news/publications/environmental/index.html

Contents

List of Figures

List of Tables

Acronyms and Abbreviations

Term	Definition
A	
AD	anno Domini
C	
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
COVID-19	Coronavirus Disease 2019
D	
DOD	United States Department of Defense
DOE	United States Department of Energy
DOECAP	DOE Consolidated Audit Program
E	
EISA	Energy Independence and Security Act
EPA	United States Environmental Protection Agency
EPCRA	Emergency Planning and Community Right-to-Know Act
ES&H	Environment, Safety, and Health
I	
ISO	International Organization for Standardization
N	
NEPA	National Environmental Policy Act
NTESS	National Technology & Engineering Solutions of Sandia, LLC
P	
PCB	polychlorinated biphenyl
R	
RCRA	Resource Conservation and Recovery Act
S	
Sandia	Sandia National Laboratories
SARA	Superfund Amendments and Reauthorization Act
SNL/KTF	Sandia National Laboratories, Kaua'i Test Facility, Hawai'i
SNL/NM	Sandia National Laboratories, New Mexico
spp.	unknown species, plural
U	
U.S.	United States
USFWS	United States Fish and Wildlife Service

Units of Measure

Unit	Definition
°F	degrees Fahrenheit
kg	kilogram

Executive Summary

Rocket launch at Kaua'i Test Facility

Sandia National Laboratories (hereinafter referred to as Sandia) 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 Annual Site Environmental Report was prepared in accordance with and as required by DOE O 231.1B, Admin Change 1, *Environment, Safety and Health Reporting*, and is approved for public release. The U.S. Department of Energy (DOE) and its management and operating contractor for Sandia are committed to safeguarding the environment, continually assessing sustainability practices, and ensuring the validity and accuracy of the monitoring data presented here. This report summarizes the environmental protection, restoration, and monitoring programs in place for Sandia National Laboratories, Kaua'i Test Facility (SNL/KTF) during calendar year 2021.

Environmental Management System

Sandia management takes environmental stewardship seriously. A robust Environmental Management System was established in 2005 as part of this commitment. This system ensures a systematic approach to identifying environmental aspects, setting environmental objectives, and monitoring environmental performance. Designed to meet the requirements of the globally recognized International Organization for Standardization (ISO) 14001:2015 standard, the Environmental Management System is ISO 14001:2015 certified. SNL/KTF personnel follow the system's requirements, as verified by an internal assessment in 2018. This Environmental Management System is Sandia's primary platform for implementing the environmental management programs that help achieve annual site sustainability goals.

Site Sustainability

Sandia defines sustainability practices and goals in a Site Sustainability Plan. The annual report provides a roll up of data from all primary Sandia sites including SNL/KTF.

Environmental Performance

DOE assesses environmental management through measures, indicators and data and collectively reports on all Sandia sites as part of an overall performance evaluation. During the most recent environmental performance evaluation, Sandia received an overall rating of very good.

Environmental Programs at Sandia National Laboratories, Kaua'i Test Facility

SNL/KTF is located on the island of Kaua'i within the boundaries of the U.S. Department of Defense Pacific Missile Range Facility. The site, which has been an active rocket-launching location since 1962, provides a high-quality integrated facility for conducting a wide range of test operations. One DOE-reportable incident occurred at SNL/KTF in 2021.

Air Quality Compliance Program. Program personnel support compliance with air quality regulations. Sandia has air quality permits at SNL/KTF and in 2021, emissions from permitted sources complied with permitted limits.

Chemical Information System. In 2021, chemical containers were tracked along with information about any related chemical hazards.

Cultural Resource Management Program. Program personnel review and document potential impacts on archeologic sites and historic properties. In 2021, four projects at SNL/KTF had ground-disturbing activities, which required the use of an archaeological monitor for all the work. Permitted, local Hawai'ian archaeologists who meet the State of Hawai'i archaeological monitor requirements completed the archaeological monitoring on-site. One project was reviewed for impact on historic buildings; there was no effect on any previously identified historic properties or historic districts.

Ecology Program. Project assessments are conducted by Ecology personnel to ensure compliance with wildlife regulations and laws and to support land use decisions at SNL/KTF. In 2021, the DOE National Nuclear Security Administration submitted a biological evaluation for launch activities at SNL/KTF in June and received concurrence from the U.S. Fish and Wildlife Service that the proposed activities might affect but are not likely to adversely affect listed species in the area when specified avoidance and minimization measures are implemented.

National Environmental Policy Act Program. Program personnel coordinate with DOE to ensure National Environmental Policy Act compliance and to provide technical assistance in project planning. NEPA review checklists are prepared to identify potential impacts from the implementation of proposed actions. In 2021, NEPA checklists were prepared and reviewed for 12 projects. The potential environmental impacts were documented.

Oil Storage Program. Oil storage containers and equipment are managed, operated, and maintained to prevent inadvertent releases to the environment and to comply with applicable regulations. In 2021, oil storage containers and equipment at SNL/KTF consisted of four used oil storage drums, three generator base tanks, one underground fuel storage tank, one aboveground fuel storage tank, and five oil-filled electrical transformers. There was one reportable oil release in 2021.

Quality Assurance. All environmental monitoring is 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.

Terrestrial Surveillance Program. Surveillance activities are conducted to analyze surface soil at SNL/KTF approximately every five years. No sampling occurred in 2021.

Waste Management Program. Some hazardous waste is generated through normal operations at SNL/KTF. The site is classified as a very small quantity generator and does not have a RCRA permit. Sandia has a hazardous waste generating ID number issued by the Hawai'i State Department of Health issued on September 23, 1994. KTF is in compliance with Hawaii regulations applicable to very small quantity generators of hazardous waste (Hawaii Administrative Rules, Title 11, Chapters 260, 261, 262, and 268)

Water Quality Program. The Water Quality Program includes drinking water and wastewater. Drinking water is obtained through the Pacific Missile Range Facility public water system. In 2021, the three on-site septic tanks were inspected, and one was pumped. There were no compliance issues.

Chapter 1. Introduction

Kaua'i Test Facility

OVERVIEW ■ The Kaua'i Test Facility has been an active rocket-launching facility since 1962. Sandia National Laboratories personnel support a variety of missions at the site, including research and development, operational training, and test and evaluation. Launch projects are conducted for various government agencies and organizations on a noninterference basis.

This Annual Site Environmental Report was prepared in accordance with and as required by the U.S. Department of Energy (DOE) per DOE O 231.1B, Admin Change 1, *Environment, Safety and Health Reporting*. This report is made available to the public in electronic form at Sandia News.

Sandia National Laboratories, hereinafter referred to as Sandia with the exception of when using an acronym to represent the facility location (SNL/KTF), is a multimission laboratory managed and operated by National Technology & Engineering Solutions of Sandia, LLC (NTESS), a wholly owned subsidiary of Honeywell International Inc., for the DOE National Nuclear Security Administration. Sandia personnel manage and operate the Kaua'i Test Facility in Hawai'i for DOE. The DOE National Nuclear Security Administration Sandia Field Office in Albuquerque, New Mexico, administers the contract and oversees contractor operations.

While all 2021 program activities were performed continuously, they are reported on a calendar-year basis unless otherwise noted (programs based on the fiscal year operate from October 1 through September 30, annually).

1.1 Purpose

Operating since 1949, Sandia's core purpose is to render exceptional service in the national interest. As a Federally Funded Research and Development Center, Sandia operates in the public interest with objectivity and independence, free from organizational conflicts of interest, and by maintaining core competencies in missions of national significance. Our principal mission is to deliver on

commitments to the nuclear deterrent, nuclear nonproliferation, and critical work for the national security community. Sandia personnel anticipate and resolve emerging national security challenges and inform the national debate for which technology policy is critical to preserving security and freedom throughout the world. Information about new technologies and accomplishments can be found at Sandia News.

1.2 History

A brief history of Sandia and of operations at SNL/KTF follows. For more details see Chapter 5.

1.2.1 Sandia National Laboratories

On November 1, 1949, Sandia Corporation, a wholly owned subsidiary of Western Electric, began managing and operating Sandia Laboratory. In 1979, Congress recognized the facility as a national laboratory. From 1993 to mid-2017, Sandia Corporation was a wholly owned subsidiary of Martin Marietta (merging with Lockheed Corporation in 1995 to form Lockheed Martin Corporation). In May 2017, the managing and operating contractor changed its name to NTESS, a wholly owned subsidiary of Honeywell International Inc.

At the end of fiscal year 2021, the Sandia workforce (for all sites) comprised approximately 14,922 employees and contractors.

1.2.2 Sandia National Laboratories, Kaua'i Test Facility

SNL/KTF has been an active rocket-launching facility since 1962, predating the establishment of the Pacific Missile Range Facility. Later construction, completed in March 2005, extended the Missile Service Tower to support DOE and the Missile Defense Agency. The most recent construction has been an upgrade of the launch field power system. From 1992 to 2021, SNL/KTF personnel have supported 119 launches from SNL/KTF, the Pacific Missile Range Facility, and other mission assets.

SNL/KTF, located on the island of Kaua'i, exists as a facility within the boundaries of the U.S. Department of Defense Pacific Missile Range Facility.

The SNL/KTF launch field was originally designed to accommodate 40 launchpads, but only 15 pads were constructed. Of these, 11 have had their out-of-use launchers removed over the years. An additional launchpad, Pad 41 (Kokole Point), was constructed at the southern point of the Pacific Missile Range Facility (Figure 1-1). The Kokole Point launch complex and associated facilities were transferred to the U.S. Navy in 2013; however, Sandia programs may launch from this location on a case-by-case basis for campaign operations. In addition to rocket launchpad sites, facilities include missile and payload assembly buildings, launch operations and data acquisition facilities, maintenance shops, and a trailer dock compound for administration and other office processing.

1.3 Location Description

SNL/KTF is located on the western coast of Kaua'i, Hawai'i. A tenant of and located within the U.S. Department of Defense (DOD) Pacific Missile Range Facility, there are agricultural fields to the north and east with the Pacific Ocean on the northwest and southwest of SNL/KTF (Figure 1-1).

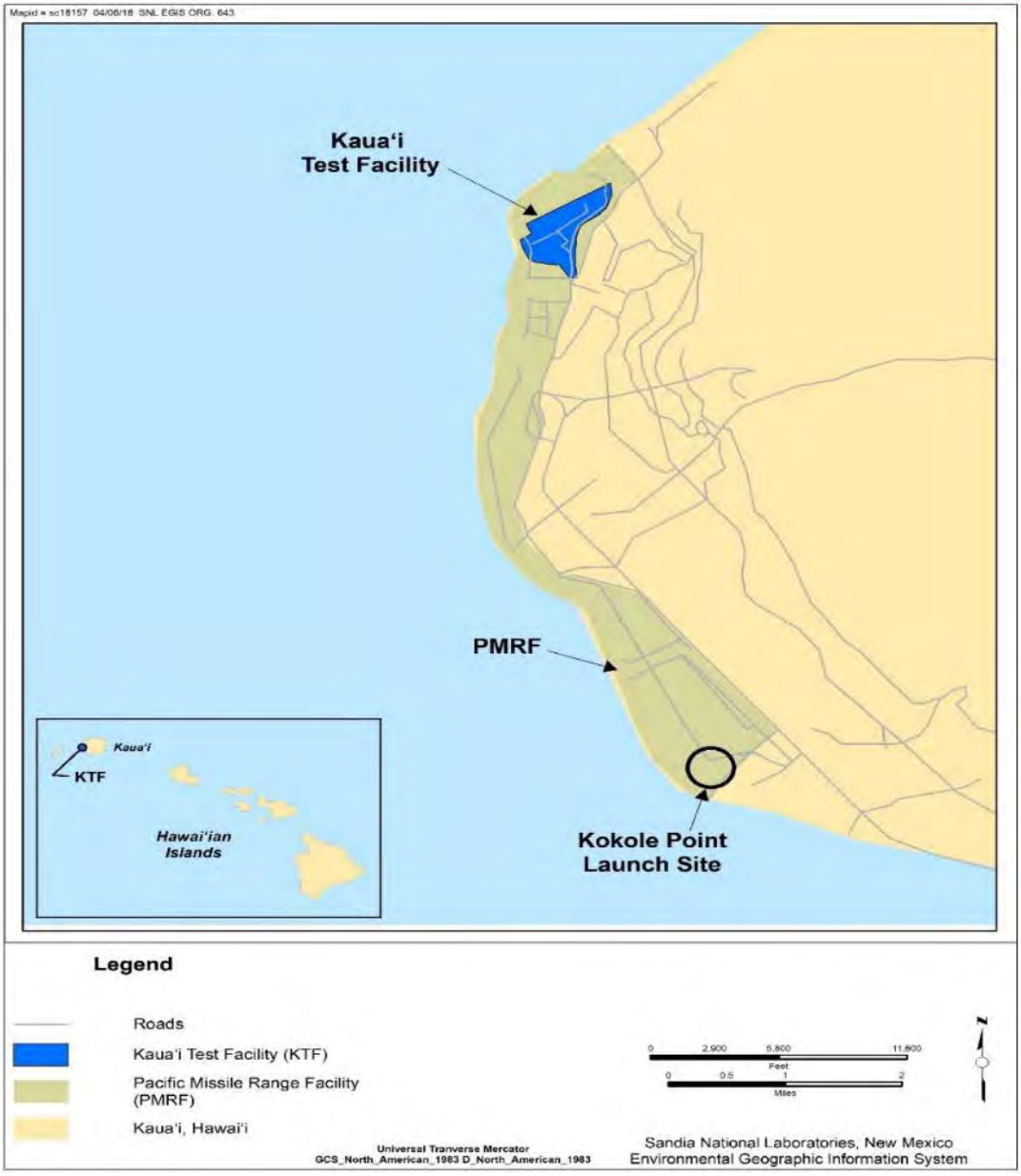

Figure 1-1. Kaua'i Test Facility location on Kaua'i, Hawai'i

1.4 Demographics

There were 15 permanent on-site personnel at SNL/KTF in 2021. During campaign operations when rocket launches occurred, approximately 200 additional people worked there. The total population of Kaua'i, Hawai'i—73,454 (U.S. Census Bureau 2020).

1.5 Activities and Facilities

SNL/KTF facilities and personnel support a variety of missions, including research and development, operational training, and testing and evaluation. Personnel conduct launch activities for multiple mission partners, other organizations, and government agencies on a noninterference basis. SNL/KTF provides a high-quality integrated facility for conducting a wide range of test operations. These operations support the launch of sounding rocket flight vehicles and payload experiments within a highly dynamic flight environment for component development and flight testing. Resources are available for assembling, testing, and launching instrumented rockets and rocket payloads; receiving, recording, and processing telemetry; and transferring data with remote airborne and ship-borne instrumentation platforms. Operations do not (currently or in the past) involve radioactive materials.

The administrative area of SNL/KTF, known as the Main Compound, and the launch field are located within fenced areas near the North Nohili access road. Inside the compound, several trailers and structures are connected by a network of concrete docks and covered walkways. Most of these facilities are used during mission operations to support customers, defense contractor personnel, and technical staff from Sandia National Laboratories, New Mexico (SNL/NM); general maintenance activities are performed during noncampaign operations. In addition, there are permanent buildings and shelters in the Main Compound and launch field, some of which are in use year-round to support and maintain SNL/KTF facilities.

In addition to operations on Kauaʻi, Sandia personnel conducted operations at Mount Haleakalā on the island of Maui (Figure 1-2) since 1962. The Sandia facility consisted of one building and a large structure used for telemetry operations, which provided high-altitude tracking for tests conducted at SNL/KTF. The site is being transferred to the Federal Aviation Administration (part of the U.S. Department of Transportation). Extensive decontamination and demolition work was done at the site in support of the transfer. The decontamination and demolition activities were completed in 2020, leaving behind two concrete slabs and the large structure to be used by other organizations; transfer was expected to be completed in 2021 but remains incomplete. Efforts continue to complete the transfer.

Figure 1-2. Operations at Mount Haleakalā, Maui

1.5.1 Rocket Launches in 2021

SNL/KTF personnel supported three rocket launches in 2021. The launches—covered by the *Site-Wide Environmental Assessment, Sandia National Laboratories, Kauaʻi Test Facility* published in March 2019 (DOE/NNSA 2019)—included the following:

- May 29, 2021, Missile Defense Agency, MRBM-T3c2, FTM-31
- July 24, 2021, Missile Defense Agency, SRBM-T4G, FTM-33 Event 1
- July 24, 2021, Missile Defense Agency, SRBM-T4G, FTM-33 Event 2

1.6 Environmental Setting

Kaua'i is the oldest, northernmost, and fourth-largest island of the main island chain within the volcanic Hawai'ian Archipelago. Kaua'i's varied geographic and topographic features include Waimea Canyon, cliffs of the Na Pali Coast, twin peaks of the old volcano (Mount Kawaikini and Mount Wai'ale'ale, elevation 5,243 feet and 5,148 feet, respectively), the Alaka'i Swamp, the flat-lying coastal Mana Plain, and the Barking Sands dune field (DOE/AL 1992).

Kaua'i is the oldest, northernmost, and fourth-largest island of the main island chain within the volcanic Hawai'ian Archipelago.

The low-lying coastal Mana Plain flanks the western slope of the island, forming gentle slopes from the volcanic uplands to the coastal margin (U.S. Navy 2010). The area is relatively flat, ranging in elevation from approximately 5 to 20 feet above mean sea level. Beach dunes parallel to the Pacific Ocean rise above the launch field to a maximum elevation of approximately 100 feet above mean sea level.

1.6.1 Geology

Kaua'i consists of a single massive shield volcano, located at the island's center, which built up from the sea floor by many thousands of thin flows of basaltic lava. The volcanic deposits are now deeply eroded and partly veneered with subsequent volcanic flows. Volcanic rocks exposed on the western half of the island are the oldest and are composed of Pliocene basaltic flows of the Waimea Volcanic Series (U.S. Navy 2010).

Toward the end of the growth of the shield volcano, a period of collapse, faulting, erosion, and subsequent volcanism affected the original surface. The collapse created a broad caldera that is 10 to 12 miles across. Erosion has since destroyed the original surface, and the Alaka'i Swamp occupies slightly dissected remnants.

The rocks of Kaua'i are all volcanic except for minor amounts of sediment derived from the volcanic rocks by erosion and a narrow, discontinuous fringe of calcareous reef and beach deposits (MacDonald, Davis, and Cox 1960). The Mana Plain is composed of a wedge of terrestrial and marine sediment (alluvium, lagoon, beach, and dune deposits) that overlie the volcanic basement (DOE/AL 1992).

1.6.2 Surface and Groundwater Hydrology

There are no natural surface water drainages on SNL/KTF, as the sand at the surface is too permeable for rainwater to accumulate and travel laterally (DOE/AL 1992).

The three geologic units (volcanic bedrock, alluvium, and dune deposits) underlying SNL/KTF constitute three different but hydraulically connected aquifers. The groundwater from all three units tends to be brackish, not potable, and is not suitable for irrigation (DOE/AL 1992). No groundwater wells are located on SNL/KTF.

1.6.3 Ecology

A description of the ecological setting—including vegetation types, wildlife, protected species, and threatened and endangered species—at the Pacific Missile Range Facility and SNL/KTF is detailed in Chapter 4.

1.6.4 Climate

The climate at SNL/KTF is typical of maritime subtropical islands with an average daily temperature range of 84°F to 66°F. August is the warmest month of the year, with daytime highs averaging 87°F and lows averaging 69°F. January is the coolest month, with daytime highs averaging 79°F and lows averaging 62°F. The region is strongly influenced by the Pacific subtropical high-pressure system. There are two main seasons in tropical and subtropical areas: a wet season and a dry or windy season.

SNL/KTF is located on the lee side of the island, which reduces the amount of annual rainfall as compared to the eastern and mountainous areas of Kauaʻi. The lee side exhibits more arid conditions, with an average annual rainfall of approximately 23 inches. The wet season generally starts in October and extends into March. June to August are the driest months of the year with an average of less than one inch of rain recorded for each month (WRCC 2020).

Winds are mostly from easterly directions on Kauaʻi. The northeast and southeast trade winds generally blow between 15 and 25 miles per hour. This global subtropical trade wind pattern occasionally becomes disrupted in the winter when cool, wet systems approach the island from the west or northwest. Relative humidity ranges from 60 to 70 percent in the summer to near 80 percent during the wet season. Direct hits from typhoons or hurricanes are rare in the Hawaiʻian Islands, though damage from nearby storms may occur. The most destructive hurricane to hit Kauaʻi was Hurricane Iniki in September 1992.

Chapter 2. Compliance Summary

Kaua'i fishing boat at sunset

OVERVIEW ■ Sandia personnel are required to comply with federal, state, and local environmental statutes, regulations, executive orders, and DOE directives. Regular audits, appraisals, and inspections identify areas for improvement as well as noteworthy practices.

Sandia personnel are required to comply with federal, state, and local environmental requirements, including DOE directives and presidential executive orders. As part of this compliance, personnel adhere to strict reporting and permitting requirements.

All operations and activities, including those that are part of environmental programs, are performed in accordance with the Environment, Safety, and Health (ES&H) policy, which includes the following statement:

> Sandia integrates environmental, safety and health throughout the lifecycle of its operations to ensure the:
> - Protection of members of the workforce by providing a safe and healthful workplace.
> - Protection of the environment by preventing or minimizing pollution and waste, pursuing sustainable resource use, and protecting biodiversity and ecosystems.
> - Protection of the public through the prevention or minimization of releases of hazardous materials.
> - Compliance with applicable ES&H requirements, including contractual requirements.
> - Establishment, measurement, and monitoring of ES&H objectives to enhance performance and drive continual improvement.

An Integrated Safety Management System is used to incorporate safety into management and work practices at all levels so that missions are accomplished while protecting the worker, the public, and the environment. Thus, management of safety functions becomes an integral part of mission accomplishment and meets requirements outlined by DOE. The following five core functions guide the integration of safety into all work practices: define the scope of work, analyze the hazards, develop and implement hazard controls, perform work within controls, and provide feedback and continuous improvement.

2.1 Environmental Compliance

The management and operating contract, also referred to as the Prime Contract, for Sandia serves as the overarching agreement between the DOE National Nuclear Security Administration and the management and operating contractor. The Prime Contract requires the management and operating contractor to comply with specific DOE directives as well as applicable federal, state, and local requirements for the management and operation of Sandia.

2.1.1 Federal Requirements

The Prime Contract requires compliance with federal requirements, including applicable federal laws and regulations as well as specific DOE directives. The significant federal requirements that pertain to environmental protection and management are presented below along with the compliance approach and compliance activities.

Environmental Planning

National Environmental Policy Act (NEPA) of 1969

Requirement(s) and Compliance Approach	Compliance Activities
The National Environmental Policy Act (NEPA) requires federal agencies to assess the impacts of proposed actions on the human and natural environment prior to making decisions. The Council on Environmental Quality (40 CFR 1500–1508) oversees NEPA implementation, principally through issuing guidance and interpreting regulations that implement NEPA procedural requirements. DOE codified its NEPA implementing procedures in 10 CFR 1021. Personnel use an online NEPA tool that uses a checklist format to document proposed actions and activities and assess them for potential environmental consequences at SNL/KTF. When projects or activities appear to be outside the scope of existing NEPA documentation, a NEPA checklist is prepared and then forwarded to DOE for review and determination. Section 3.1 provides information on NEPA activities.	• Ensure that all environmental impacts have been assessed adequately. • Coordinate NEPA checklist reviews with cooperating agency personnel and DOE personnel. • Inform project owners of environmental requirements. • Document a NEPA determination for proposed actions.

Environmental Management System, Site Sustainability, Emergency Planning, and Community Right-to-Know Act

DOE O 436.1, Department Sustainability

Requirement(s) and Compliance Approach	Compliance Activities
DOE O 436.1, *Department Sustainability*, places environmental management systems and site sustainability at the forefront of environmental excellence. This order requires development of a site sustainability plan for identification of contributions toward meeting DOE sustainability goals and an environmental management system for a continuing cycle of planning, implementing, evaluating, and improving processes to achieve environmental goals. Personnel comply with this order through implementation of an environmental management system, which is third-party certified to ISO 14001:2015 at SNL/NM and SNL/CA (the primary operating locations). While operations at SNL/KTF are required to comply with the environmental management system requirements, operations have not been included in the ISO 14001:2015 certification due to the limited scale of operations there. This order also specifies requirements for compliance with Emergency Planning and Community Right-to-Know Act requirements. See Table 2-1 for specifics.	• Follow environmental management system requirements, including identification of the environmental aspects and impacts of activities. • Establish and implement procedures and processes. • Establish and implement an annual site sustainability plan for Sandia locations including SNL/KTF. • Evaluate operations to identify continuous improvement opportunities. • Fulfill emergency planning and reporting requirements.

Hazardous Waste and Environmental Restoration

Comprehensive Environmental Response, Compensation, and Liability Act of 1980, and amended in 1986

Requirement(s) and Compliance Approach	Compliance Activities
The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980, and amended in 1986, establishes liability compensation, cleanup, and emergency response requirements for inactive hazardous waste sites. In addition, CERCLA requires federal facilities to report hazardous substance spills to the National Response Center and perform any necessary response action. The United States Environmental Protection Agency (EPA) recommended continued reevaluation for environmental contamination at SNL/KTF due to ongoing activities at the launch facility there (EPA 1996). The Superfund Amendments and Reauthorization Act (SARA Title III) establishes additional reporting requirements that are addressed in Table 2-1.	• Environmental restoration sites have been closed through the regulatory process. • See Table 2-1 for compliance activities.

Federal Facility Compliance Act of 1992

Requirement(s) and Compliance Approach	Compliance Activities
The Federal Facility Compliance Act of 1992 requires federal facilities to comply with all federal, state, and local requirements for hazardous and solid waste, including full compliance with the restrictions and prohibitions on extended storage of mixed wastes that do not meet the applicable hazardous waste treatment standards. SNL/KTF operations do not generate mixed waste, and no mixed waste is currently stored on-site.	• No activities are associated with this requirement.

Resource Conservation and Recovery Act, enacted in 1976, as amended

Requirement(s) and Compliance Approach	Compliance Activities
The Resource Conservation and Recovery Act (RCRA), enacted in 1976, as amended, sets forth the framework for managing nonhazardous and hazardous solid waste, including the hazardous waste component of mixed waste. SNL/KTF operations generate less than 100 kg of hazardous waste through normal operations each month, which equates to very small-quantity generator status. Section 3.3 provides information on waste management.	• Adhere to the manifest and pre-transport requirements in 40 CFR 262, *Standards Applicable to Generators of Hazardous Waste*, as incorporated and amended in the Hawai'i Administrative Rules, Title 11, Section 262-1, "Hazardous Waste Management." • Minimize waste via recycling and material recovery. • Collect and screen material and waste in preparation for shipment to off-site facilities for recycling, storage, treatment, or disposal.

Radiation Protection

Atomic Energy Act of 1954

Requirement(s) and Compliance Approach	Compliance Activities
The Atomic Energy Act of 1954 specifies proper management of source, special nuclear, and byproduct material. DOE has the authority to manage operations based on applicable statutes, federal regulations, and DOE directives. SNL/KTF operations do not (currently or in the past) involve radioactive materials (see Section 1.5 and Section 3.7).	• No activities are associated with this requirement.

DOE O 458.1 Admin Change 4, Radiation Protection of the Public and the Environment

Requirement(s) and Compliance Approach	Compliance Activities
This order establishes requirements to protect the public from undue radiation exposure, demonstrate compliance with public dose limits from air pathways, control releases of radioactive discharges, control radioactive waste, protect drinking water and groundwater, protect biota, control the release of property with residual radioactivity, and manage radiation-related records. The Terrestrial Surveillance Program activities at SNL/KTF are conducted as a best management practice. The Terrestrial Surveillance Program is driven by DOE O 458.1, yet operations there do not involve radioactive materials (see Section 3.7).	• Sample and analyze soil for metals as a best management practice.

Air Quality

Clean Air Act of 1970, as amended

Requirement(s) and Compliance Approach	Compliance Activities
The Clean Air Act of 1970, as amended, governs the management of nonradiological emissions with compliance achieved through adherence to the conditions of permits and applicable regulations. Section 3.4 provides information on air quality compliance.	• Confirm that planned stationary sources of air pollutants (e.g., equipment) and potential emission from operations meet applicable local and federal requirements. • Maintain documentation that confirms that sources are in compliance with regulations and/or permitted operating conditions. • Submit monitoring reports, annual emissions inventories, and other compliance assurance documentation to regulatory agencies.

Water Quality

Clean Water Act of 1972 and amendments

Requirement(s) and Compliance Approach	Compliance Activities
The Clean Water Act of 1972 and amendments establishes a permitting structure and regulatory direction to protect the "waters of the United States" by restoring and maintaining the chemical, physical, and biological integrity of United States waters; protecting fish, wildlife, and recreation; and reducing pollutant discharges. There are no drinking water or groundwater monitoring wells at SNL/KTF. Sanitary sewer discharge is monitored at three on-site state-registered septic tanks. Stormwater permits, inspections, and sampling are not required for normal operations. However, new construction activities that exceed one acre of soil disturbance require permitting under the Construction General Permit. When needed, stormwater pollution prevention plans are developed and include control measures, site inspections, and annual reporting requirements. See Section 3.8 for more information on water quality programs.	• Monitor three state-registered septic tanks and perform periodic septic tank inspections. • Pump septic tanks as needed. • Gain and comply with a stormwater permit for new construction activities exceeding one acre of soil disturbance. • Implement a stormwater pollution prevention plan to prevent unpermitted discharges, conduct inspections, and complete annual reporting requirements.

Energy Independence and Security Act of 2007, Section 438

Requirement(s) and Compliance Approach	Compliance Activities
The Energy Independence and Security Act (EISA) of 2007, Section 438, requires federal agencies to manage stormwater runoff from federal development projects for the protection of water resources. Sandia projects planned through the NEPA process (see "National Environmental Policy Act") are assessed for EISA § 438 applicability. Site planning, design, construction, and maintenance strategies are applied to maintain or restore predevelopment site hydrology. See Section 3.8 for more information on water quality programs.	• Identify projects that require EISA compliance. • Develop drainage plans and design detention features. • Conduct inspections and maintain detention features.

Oil Pollution Act of 1990 (§ 311)

Requirement(s) and Compliance Approach	Compliance Activities
The Oil Pollution Act of 1990 (§ 311) establishes requirements for the prevention of, preparedness for, and response to oil discharges at specific non-transportation-related facilities. This act requires the development and implementation of a spill prevention, control, and countermeasure plan. The Pacific Missile Range Facility has a spill prevention, control, and countermeasure plan (U.S. Navy 2017) in compliance with 40 CFR 112, *Oil Pollution Prevention*, and the Clean Water Act. A single underground gasoline storage tank (2,500 gallons) is maintained on-site.	• Coordinate and cooperate with the Pacific Missile Range Facility Spill Prevention, Control, and Countermeasure Plan, including reporting and responding to a spill. • Inspect aboveground oil storage containers routinely. • Train oil-handling personnel routinely.

Requirement(s) and Compliance Approach	Compliance Activities
Section 3.6 provides information on the Oil Storage Program.	• Maintain an oil storage container inventory. • Incorporate oil spill prevention requirements and practices into processes, procedures, and new container installations.

Safe Drinking Water Act of 1974, as amended

Requirement(s) and Compliance Approach	Compliance Activities
The Safe Drinking Water Act of 1974, as amended, was established to protect the quality of drinking water in the United States, focusing on all waters actually or potentially designed for drinking use, whether from aboveground or underground sources. All drinking water at SNL/KTF is supplied by the Pacific Missile Range Facility drinking water system or by a vendor.	• No activities are associated with this requirement.

America's Water Infrastructure Act of 2018

Requirement(s) and Compliance Approach	Compliance Activities
America's Water Infrastructure Act of 2018 improves drinking water and water quality, deepens infrastructure investments, enhances public health and quality of life, increases jobs, and bolsters the economy. The act's provisions represent changes to the Safe Drinking Water Act. All drinking water at SNL/KTF is supplied by the Pacific Missile Range Facility drinking water system or by a vendor.	• No activities are associated with this requirement.

Emergency Planning and Community Right-to-Know Act of 1986

Requirement(s) and Compliance Approach	Compliance Activities
The Emergency Planning and Community Right-to-Know Act (EPCRA) of 1986, also known as Title III of the Superfund Amendments and Reauthorization Act, requires reporting of toxic chemicals used and released by federal, state, and local governments and industry. Chemical hazard information is provided to the community for awareness and enhancement of emergency planning efforts. See Table 2-1 for specifics.	• Maintain and report on a chemical inventory. • Report qualifying releases.

Federal Insecticide, Fungicide, and Rodenticide Act, enacted in 1910 and amended in 1972

Requirement(s) and Compliance Approach	Compliance Activities
The Federal Insecticide, Fungicide, and Rodenticide Act, enacted in 1910 and amended in 1972, regulates the use of herbicides, rodenticides, and insecticides. EPA regulations and applicable label guidelines are followed.	• Contract state-licensed subcontractors supply, handle, and apply covered products.

Toxic Substances Control Act, enacted in 1976 and later amended

Requirement(s) and Compliance Approach	Compliance Activities
The Toxic Substances Control Act, enacted in 1976 and later amended, regulates the manufacture, processing, distribution, use, and disposal of specific chemical substances and/or mixtures. Compliance with this act includes managing asbestos and polychlorinated biphenyls (PCBs). There are no transformers containing PCBs at SNL/KTF. Section 3.3 provides information on asbestos management.	• Conduct asbestos abatement in accordance with applicable regulatory requirements.

Pollution Prevention

Pollution Prevention Act of 1990

Requirement(s) and Compliance Approach	Compliance Activities
The Pollution Prevention Act of 1990 declares as national policy that pollution should be prevented or reduced at the source wherever feasible. Source reduction is defined as any practice that decreases the amount of any hazardous substance, pollutant, or contaminant from entering any waste stream or from being released into the environment prior to recycling, treatment, or disposal. A toxic chemical source reduction and recycling report is required for facilities that meet the reporting requirements under EPCRA, Section 313. See "Emergency Planning and Community Right-to-Know Act of 1986."	• Conduct database queries for chemical purchases annually. • Compare environmental releases with EPCRA reporting thresholds. • Prepare annual reports and submit them to federal, state, and local regulatory agencies. • Follow green purchasing practices.

Natural Resources

Endangered Species Act of 1973, amended in 1982
EO 11988 of 1977, Floodplain Management, as amended
EO 11990 of 1977, Protection of Wetlands, as amended
EO 13112 of 1999, Invasive Species
EO 13751 of 2016, Safeguarding the Nation from the Impacts of Invasive Species
Fish and Wildlife Conservation Act (PL 96-366), enacted in 1980
Lacey Act Amendments (PL 97-79), enacted in 1981
Marine Mammal Protection Act of 1972
Migratory Bird Treaty Act of 1918 (and amendments)
Sikes Act of 1960 (PL 86-97), enacted in 1960, and the amendments of 1986 (PL 99-561) and 1997 (PL 105-85 Title XXIX), reauthorized in 2013

Requirement(s) and Compliance Approach	Compliance Activities
A variety of statutes and presidential executive orders ensure protection and conservation of natural resources, including the following: • Endangered Species Act of 1973, amended in 1982 • EO 11988 of 1977, Floodplain Management, as amended • EO 11990 of 1977, Protection of Wetlands, as amended	• Monitor biota. • Collect ecological data. • Consultation with the United States Fish and Wildlife Service (USFWS)as appropriate.

Requirement(s) and Compliance Approach	Compliance Activities
• EO 13112 of 1999, Invasive Species • EO 13751 of 2016, Safeguarding the Nation from the Impacts of Invasive Species • Fish and Wildlife Conservation Act (PL 96-366), enacted in 1980 • Lacey Act Amendments (PL 97-79), enacted in 1981 • Marine Mammal Protection Act of 1972 • Migratory Bird Treaty Act of 1918 (and amendments) • Sikes Act of 1960 (PL 86-97), enacted in 1960, and the amendments of 1986 (PL 99-561) and 1997 (PL 105-85 Title XXIX), reauthorized in 2013 Natural resources are protected via compliance with applicable statutes, long-term surveillance, and ecological compliance. Management is initially through the NEPA process (see "National Environmental Policy Act") and review of project plan effects. Chapter 4 provides more information on the Ecology Program.	• Collaborate with host facility regarding Endangered Species Act efforts.

Cultural Resources

American Indian Religious Freedom Act, enacted in 1978 and amended in 1994
Archaeological Resources Protection Act, enacted in 1979 and amended in 1988
DOE O 144.1, Department of Energy American Indian Tribal Government Interactions and Policy
DOE O 430.1C, Real Property Asset Management
DOE P 141.1, Management of Cultural Resources
National Historic Preservation Act, enacted in 1966 and amended in 2000, Section 106
Native American Graves Protection and Repatriation Act, enacted in 1990

Requirement(s) and Compliance Approach	Compliance Activities
Multiple statutes and DOE directives provide for the management and preservation of cultural resources, including the following: • American Indian Religious Freedom Act, enacted in 1978 and amended in 1994 • Archaeological Resources Protection Act, enacted in 1979 and amended in 1988 • DOE O 144.1, *Department of Energy American Indian Tribal Government Interactions and Policy* • DOE O 430.1C, *Real Property Asset Management* • DOE P 141.1, *Management of Cultural Resources* • National Historic Preservation Act, enacted in 1966 and amended in 2000, Section 106 • Native American Graves Protection and Repatriation Act, enacted in 1990 Protection of cultural resources (including historical properties) is initially provided through the NEPA process (see "National Environmental Policy Act") and review of project plan effects. Cultural Resource Management Program personnel support	• Develop internal management plans. • Conduct cultural resource surveys. • Survey property to determine eligibility for inclusion in the National Register of Historic Places. • Prepare documentation to support planning activities and decisions. • Review NEPA checklists to identify impacts on cultural resources. • Monitor construction activities for impacts on cultural resources.

Requirement(s) and Compliance Approach	Compliance Activities
DOE coordination with other federal agencies (local, state, and tribal) to protect and preserve cultural resources. Chapter 5 provides more information about the Cultural Resource Management Program.	

Reporting

DOE O 231.1B, Admin Change 1, Environment, Safety and Health Reporting

Requirement(s) and Compliance Approach	Compliance Activities
DOE O 231.1B, Admin Change 1, *Environment, Safety and Health Reporting*, ensures that DOE receives information about events that have affected or could adversely affect the health, safety, and security of the public or workers, the environment, the operation of DOE facilities, or DOE credibility. It enhances mission safety and promotes the sharing of effective practices to support continuous improvement and adaptation to change.	• Produce an annual site environmental report. • Report on environmental program activities, monitoring results, accidental releases, and waste management operations.

DOE O 232.2A, Chg1 (MinChg) Occurrence Reporting and Processing of Operations Information

Requirement(s) and Compliance Approach	Compliance Activities
DOE O 232.2A, Chg1 (MinChg), *Occurrence Reporting and Processing of Operations Information*, requires timely notification to DOE about events that could adversely affect the health and safety of the public or workers, the environment, DOE missions, or DOE credibility. Sandia personnel promote organizational learning through investigation and analysis of reported events and conditions that adversely affect or may adversely affect personnel, the public, property, the environment, or the DOE mission.	• Track all environmental events.

Quality Assurance

DOE O 414.1D Admin Change 1, Quality Assurance

Requirement(s) and Compliance Approach	Compliance Activities
DOE O 414.1D, Change 2 (LtdChg), *Quality Assurance*, is intended to achieve quality in all work and ensure that products and services meet or exceed customer requirements and expectations. All environmental sampling and analyses at SNL/KTF conform to applicable quality assurance plans, sampling plans, and field operations. Chapter 6 provides information on quality assurance.	• Develop quality assurance plans, operating plans, and sampling plans collectively for all Sandia locations. • Provide a statement of work for contract laboratories collectively for all Sandia locations. • Participate in quality assurance audits of all contract laboratories that provide services collectively for all Sandia locations.

Pritchardia spp.

2.1.2 Chemical Inventory and Toxic Release Inventory Reporting

The chemical inventory report and the toxic release inventory report for SNL/KTF in 2021 were submitted to EPA and support compliance with EPCRA. The chemical inventory report documents toxic chemicals in use and all chemical purchases. Table 2-1 lists the EPCRA reporting requirements.

Table 2-1. SNL/KTF applicable EPCRA reporting requirements

Section	EPCRA Section Title	Description	Reporting Required in 2021?
301–303	Emergency Planning	Sections 301–303 of EPCRA require an annual report that lists the inventories of chemicals that are above the reportable threshold planning quantities, including the location of the chemicals and the emergency contacts.	Yes
304	Emergency Notification	Section 304 of EPCRA requires an immediate notification following the accidental release of a reportable quantity of extremely hazardous substances.	No
311–312	Community-Right-to-Know: Toxic Chemical Release Inventory Reporting	Sections 311–312 of EPCRA provide requirements for maintaining safety data sheets for hazardous chemicals and for submitting inventory forms for these chemicals.	Yes
313	Toxic Release Inventory	Section 313 of EPCRA requires that a Toxic Release Inventory report be submitted for facilities that release toxic chemicals listed in SARA Title III over a threshold value.	No

The chemical inventory report for SNL/KTF was submitted to EPA. In 2021, there were no reportable quantity releases of extremely hazardous substances requiring notification under Section 304 of EPCRA. A Toxic Release Inventory report was not required under Section 313 of EPCRA.

2.1.3 Hawai'i State Environmental Requirements

The State of Hawai'i requirements shown in Table 2-2 are applicable to environmental program operations at SNL/KTF.

Table 2-2. Hawai'i Administrative Rules and Hawai'i Revised Statutes

Chapter and Provisions
HAR Title 11, Department of Health
HAR Title 11, Chapter 20, Rules Relating to Potable Water Systems
HAR Title 11, Chapter 58.1, Solid Waste Management Control
HAR Title 11, Chapter 60.1, Air Pollution Control
HAR Title 11, Chapter 62, Wastewater Systems
HAR Title 11, Chapter 281.1, Underground Storage Tanks
HAR Title 11, Chapter 451, State Contingency Plan
HRS Title 12, Conservation and Resources
HRS Chapter 195, Natural Area Reserves System
HRS Title 19, Health
HRS Chapter 128D, Environmental Response Law
HRS Chapter 340E, Safe Drinking Water

Note: The Hawai'i Administrative Rules are accessed through https://cca.hawaii.gov/hawaii-administrative-rules/. The Hawai'i Revised Statutes are accessed through https://www.capitol.hawaii.gov/hrsall/.

2.2 Environmental Management System

The environmental management system is a continuing cycle of planning, implementing, evaluating, and improving processes to achieve environmental goals. This system facilitates identification of the environmental aspects and impacts of Sandia's activities, products, and services; identification of risks and opportunities that could impact the environment; evaluation of applicable compliance obligations; establishment of environmental objectives; and creation of plans to achieve those objectives and monitor their progress.

Aspects are any elements of activities, products, or services that can interact with the environment, and *impacts* are any changes in the environment, whether adverse or beneficial, wholly or partially resulting from activities, products, or services.

DOE O 436.1, *Departmental Sustainability*, provides requirements for managing sustainability practices. This order is implemented through an ISO 14001-certified environmental management system. Sandia National Laboratories received initial ISO 14001:2004 certification in June 2009. In 2015, the site-specific certifications for primary operating locations in New Mexico and California were integrated into a multisite ISO 14001:2004 certification. In 2018, the environmental management system was recertified under the new ISO 14001:2015. Operations at SNL/KTF are required to follow the environmental management system requirements via internal Sandia procedures but have not been included in the ISO 14001:2015 certification due to the limited scale of operations there.

In January 2018, an environmental management system assessment was conducted to evaluate conformance with ISO 14001:2004 requirements at SNL/KTF.

The environmental management system provides the following benefits:

- Improved environmental performance

- Enhanced compliance with environmental regulations
- Strengthened pollution prevention efforts
- Improved resource conservation
- Increased environmental efficiencies and reduced costs
- Enhanced image with the public, regulators, and potential new hires
- Heightened awareness of environmental issues and responsibilities

For fiscal year 2021, air-emissions greenhouse gasses were identified as a significant aspect for Sandia operations at SNL/KTF. When significant aspects and negative impacts have been identified, environmental objectives—at all operating levels—are established to guide efforts toward minimizing those aspects and impacts.

2.2.1 Site Sustainability Plan

A site sustainability plan is prepared annually and identifies Sandia's combined contributions toward meeting DOE sustainability goals and the broader sustainability program set forth in EO 14008, *Tackling the Climate Crisis at Home and Abroad*. The most recent plan, *Fiscal Year 2022 Site Sustainability Plan* (SNL/NM 2021), describes the performance status of all primary Sandia locations for fiscal year 2021.

2.2.2 Sustainability Awards

The DOE Sustainability Performance Division sponsors the DOE Sustainability Awards, which recognize outstanding sustainability contributions by individuals and teams at DOE facilities across the country. The awards note excellence in energy, water, and fleet management projects and practices. Each year, environmental management system personnel select nominees from all primary Sandia locations for that year's Environmental Excellence Awards. In 2021, six nominations were submitted for the DOE Sustainability Awards and the 2021 Sustainability Champion Award. These award submissions were not for activities at SNL/KTF for 2021.

2.3 Environmental Performance

Sandia performance is measured for all locations as progress toward achieving site environmental objectives, meeting or exceeding compliance, and contributing to corporate and contract performance goals. Results are tracked and reported internally through the ES&H Assurance Dashboard, the management review process, and management reports.

Additionally, criteria for Sandia performance evaluation were set forth in the *Fiscal Year (FY) 2021 DOE/NNSA Strategic Performance Evaluation and Measurement Plan (PEMP)* (DOE/NNSA/SFO 2022a). Subsequently, the DOE National Nuclear Security Administration Sandia Field Office prepared the *FY2021 Performance Evaluation Summary* (DOE/NNSA/SFO 2022b), assessing the management and operating contractor performance including environment, health, and safety for October 1, 2020, through September 30, 2021. The performance evaluation is the annual DOE National Nuclear Security Administration report card that ascribes a rating to six key performance goals and an overall rating. Sandia received a rating of excellent in three of the six goals: Mission Execution: Global Nuclear Security; DOE and Strategic Partnership Projects Mission Objectives; and Science, Technology and Engineering. A rating of very good was received in the three remaining categories: Mission Execution: Nuclear Weapons, Mission Enablement, and Mission Leadership. Sandia received an overall rating of very good.

2.3.1 Audits, Appraisals, and Inspections in 2021

Sandia's environmental programs are routinely subjected to audits, appraisals, inspections, and/or verifications by external agencies. The internal audit group may also conduct assessments, including reviews of the implementation of applicable policies, processes, or procedures; evaluations of corrective action validation assessments; and surveillances and walk-throughs. Self-assessments may evaluate performance and compliance and identify deficiencies and opportunities for improvement as well as noteworthy practices and lessons learned. In 2021, an assessment was completed for air quality permit compliance. The assessment resulted in no findings. No other audits or assessments were performed at KTF in 2021.

2.3.2 Occurrence Reporting in 2021

Under DOE O 232.2A, Chg 1 (MinChg), *Occurrence Reporting and Processing of Operations Information*, the current order for occurrence reporting, *occurrences* are defined as "events or conditions that adversely affect, or may adversely affect, DOE (including the National Nuclear Security Administration) or contractor personnel, the public, property, the environment, or the DOE mission." Events or conditions meeting the criteria thresholds identified in this order are occurrences. Whereas some environmental releases may not meet DOE O 232.2A Chg1 (MinChg) reporting thresholds, they may still be reportable to outside agencies.

Occurrences that met DOE O 232.2A Chg1 (MinChg) criteria were entered into the DOE Occurrence Reporting and Processing System database. For this Annual Site Environmental Report, the Occurrence Reporting and Processing System database was queried for SNL/KTF occurrences in the following reporting criteria groups (as defined by DOE O 232.2A Chg1 [MinChg]):

- Group 5, Environmental
- Group 9, Noncompliance Notifications
- Group 10, Management Concerns and Issues (with identified environmental impact)
- Any occurrence that involved a Sandia environmental program

Qualifying occurrences that took place within a building are not provided in this report.

During 2021, one occurrence met the query criteria for reporting in the Annual Site Environmental Report. Table 2-3 presents this occurrence and also cross-references DOE O 232.2A reportable occurrences that were reportable to an outside agency, if applicable.

Table 2-3. Occurrence reports per DOE O 232.2A, 2021

Reporting Criteria	Month	Report Level	Report Number and Title	Also Reported to an Outside Agency
Group 10, Management Concerns and Issues 10 (1) - An event, condition, or series of events that does not meet any of the other reporting criteria but is determined by the Facility Manager or line management to be of safety significance or of concern for that facility or other facilities or activities in the DOE complex See Section 3.6.	September	Informational	**NA--SS-SNL-5000-2021-0004** Transformer Oil Spill at KTF	• Pacific Missile Range • National Response Center • State of Hawai'i

Per DOE, *occurrences* are defined as "events or conditions that adversely affect, or may adversely affect, DOE (including the National Nuclear Security Administration) or contractor personnel, the public, property, the environment, or the DOE mission."

2.4 Environmental Permit Status

Environmental permits for SNL/KTF include those for a wastewater system, diesel generators, and an underground storage tank issued by the State of Hawai'i. Table 2-4 lists the applicable environmental permits in effect at SNL/KTF in 2021.

Table 2-4. SNL/KTF environmental permits, 2021

Permit Type	Permit Number	Issue Date	Expiration Date	Regulatory Agency
Individual wastewater system	File #4056-SNL, TMK: (4) 1-2-002:013	December 1, 2004	Not applicable	State of Hawai'i Department of Health
Noncovered source permit (two stand-by diesel generators)	NSP 0429-01-N	September 28, 2015	September 27, 2020[a]	State of Hawai'i Department of Health
Underground storage tank (2,500 gallons)	P-2016-064-R1	June 9, 2021	June 8, 2026	State of Hawai'i Department of Health

[a] Renewal application was received by the Hawai'i Department of Health Clean Air Branch on July 2, 2020.

Chapter 3. Environmental Programs

Island of Kaua'i

OVERVIEW ■ Sandia personnel take the responsibility of protecting the environment seriously. Numerous program teams monitor the environment and perform activities at SNL/KTF to help prevent pollution and conserve natural resources.

Sandia personnel providing services for SNL/KTF take the responsibility of protecting the environment seriously. Personnel demonstrate this responsibility every day by striving to minimize the adverse environmental impacts of the work done. Environmental Program subject matter experts are responsible for knowing and understanding federal, state, and local requirements for their programs. Presidential executive orders and DOE guidance documents are also used to establish program criteria.

The current environmental programs and focus areas include:

- National Environmental Policy Act Program (Section 3.1)
- Chemical Information System (Section 3.2)
- Waste Management Program (Section 3.3)
- Air Quality Compliance Program (Section 3.4)
- Meteorology Program (Section 3.5)
- Oil Storage Program (Section 3.6)
- Terrestrial Surveillance Program (Section 3.7)
- Water Quality programs (Section 3.8)
- Ecology Program (Chapter 4)
- Cultural Resources Program (Chapter 5)

3.1 National Environmental Policy Act Program

NEPA Program personnel provide technical assistance to ensure that operations are reviewed for compliance with NEPA. For all proposed projects and activities, project owners must complete a NEPA checklist using the NEPA Module application. A NEPA checklist is an internal form used by Sandia NEPA personnel to assess projects and activities for any environmental impacts.

NEPA Program personnel review projects and activities for conformance with existing DOE NEPA authorization as contained in environmental assessments and impact statements. Other relevant environmental program subject matter experts also review proposed projects and activities to determine and communicate any applicable environmental permitting and/or other requirements for the proposed activity to project managers. Project managers are required to ensure that all environmental requirements are met.

DOE analyzed the impacts of Sandia operations, presented in *Site-Wide Environmental Assessment, Sandia National Laboratories, Kaua'i Test Facility* (DOE/NNSA 2019), for continued operations at SNL/KTF.

In 2021, the NEPA Program team completed 12 NEPA reviews using the Sandia NEPA checklist for SNL/KTF. Six NEPA checklists were transmitted to DOE for review and determination. The team also supported several additional programmatic activities performed at either SNL/KTF or the Pacific Missile Range Facility.

The following NEPA activities required DOE review and determination in 2021.

Operations

NEPA checklists for the following operations were submitted to DOE in 2021:

- Continued facility operations
- Prototype design for integration testing of flight technologies (two projects)
- Communication equipment installation

Facility Projects

NEPA checklists for the following facility projects were submitted to DOE in 2021:

- Geotechnical study for an administrative building
- Utility projects

3.2 Chemical Information System

The Chemical Information System for all Sandia locations is a comprehensive chemical information tool used for all Sandia sites 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. The Chemical Information System compiles information concerning chemical hazards and appropriate protective measures for Emergency Management Operations, other ES&H programs, and the workforce.

The inventory system used at SNL/KTF to track and manage chemicals provides the chemical or product name, its location and quantity, and information about who is responsible for the chemical. Chemical hazards are reported on safety data sheets, and the Chemical Information System currently contains more than 125,000 safety data sheets in its library. 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 help reduce

sources, which helps to minimize chemical purchases and waste disposal expenses. SNL/KTF currently has 1,548 containers in inventory in the Chemical Information System.

A pre-procurement module, ChemPro is used to request permission for new chemical purchases. The system runs a series of queries, comparing the requested purchasing information to regulatory limits, and determines whether the requested chemical and volume is approved for use and storage in the specified location. If approved, the requestor is given a chemical approval number, which must be provided to the chemical vendor as part of the purchasing process. ChemPro allows for proactive environmental and safety planning.

3.3 Waste Management Program

The site generates common household solid waste and is classified as a very small quantity generator of hazardous waste, and personnel follow applicable requirements. EPA Region 9 and the Hawai'i State Department of Health issued a hazardous waste generator identification (HI-0000-363309) to Sandia on September 23, 1994.

At SNL/KTF, compliance with the Toxic Substances Control Act involves management of PCBs and asbestos. The transformers on the SNL/KTF site have been tested and are free of PCBs. Asbestos abatement-related activities are conducted in accordance with applicable regulatory requirements as needed.

The SNL/NM asbestos management team conducted a comprehensive asbestos survey in July 2008. One hundred and ten cubic yards of asbestos-containing materials were identified at SNL/KTF, and 91 cubic yards were identified at the Mount Haleakalā site on Maui.

In 2020, asbestos abatement was concluded at the Mount Haleakalā site on Maui. No additional asbestos-containing materials were removed in 2021.

3.4 Air Quality Compliance Program

As required, the 2021 Annual Emissions Report for air emissions was submitted to the State of Hawai'i (DOE/NNSA 2021a). The annual fee was submitted to the State of Hawai'i for 2021 as required by the Noncovered Source Permit. All operations at SNL/KTF complied with permitted operating limits.

The two diesel-fired power generators at SNL/KTF are permitted for operation by the State of Hawai'i under a Noncovered Source Permit (Hawai'i DOH). These generators are subject to the provisions of the following federal regulations (the specific requirements of these standards are detailed in special conditions within the permit):

- 40 CFR 60, *Standards of Performance for New Stationary Sources,* Subpart A, "General Provisions"
- 40 CFR 60, *Standards of Performance for New Stationary Sources*, Subpart IIII, "Standards of Performance for Stationary Compression Ignition Internal Combustion Engines"

Rocket launches are considered mobile sources of air emissions, and rocket launch emissions are included in the review against Toxic Release Inventory reporting thresholds.

The two monitoring reports for the Noncovered Source Permit were submitted to the State of Hawai'i for 2021 operations within required timelines (DOE/NNSA 2021a; DOE/NNSA 2021b). The highest total combined operating hours for a rolling 12-month period was 390.6 hours, which occurred in the period from February 2020 to January 2021.

3.5 Meteorology Program

Sandia personnel operate on-site meteorological instruments at KTF which are used during test periods to characterize ground level and atmospheric wind conditions. Additionally, climatic information, representative of SNL/KTF, is obtained from Pacific Missile Range Facility personnel, and severe weather notifications are issued automatically by the Pacific Missile Range Facility Emergency Operations Center to all SNL/KTF resident personnel.

3.6 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/KTF. Aboveground oil storage containers at SNL/KTF operate under the Pacific Missile Range Facility Spill Prevention, Control, and Countermeasure Plan (U.S) as required by 40 CFR 112, *Oil Pollution Prevention* and the Clean Water Act. The Pacific Missile Range Facility Spill Prevention, Control, and Countermeasure Plan describes the oil storage facilities at SNL/KTF and the mitigation controls in place to prevent inadvertent discharges of oil.

The SNL/KTF inventory of oil storage containers and equipment operating under the Pacific Missile Range Facility Spill Prevention, Control, and Countermeasure Plan include:

- One portable diesel fuel generator base tank (192 gallons)
- One stationary aboveground diesel fuel storage tank (10,000 gallons)
- Two stationary diesel fuel generator base tanks (300 gallons each)
- Four 55-gallon drums used for collecting and storing oil
- Five in-service oil-filled electrical transformers

In addition to aboveground oil storage containers at SNL/KTF, a single underground gasoline storage tank (2,500 gallons) is maintained on-site and is subject to regulation under the Hawai'i Administrative Rules, Title 11, Chapter 281, *Underground Storage Tanks*. The underground storage tank is permitted with the Hawai'i State Department of Health. The tank leak detection system equipment is inspected and functionally tested annually in accordance with requirements. In 2021, the underground piping between the fuel dispenser and the underground storage tank was modified to a "safe suction" configuration, thereby eliminating the requirement for piping release detection equipment.

In 2021, a release of an estimated 20 gallons of non-PCB transformer oil occurred onsite and was reported to the National Reporting Center, the Hawai'i Hazard Evaluation and Emergency Response Office, and the Local Emergency Planning Committee. The release occurred during handling of two out-of-service oil-filled electrical transformers, which were subsequently disposed of in accordance with applicable regulatory requirements. The remediation of impacted soil was completed by an approved subcontractor in 2021. Samples were collected of the residual oil and remaining soil and analyzed for PCBs and total petroleum hydrocarbons. Sample results were determined to be non-detect for PCBs and below applicable action levels for total petroleum hydrocarbons as specified by the Hawai'i Department of Health cleanup guidance for oil spills. Sandia personnel submitted a report of the remediation activities and requested a no further action determination from the Hawai'i Hazard Evaluation and Emergency Response Office. As of the end of 2021 this determination was pending concurrence from the Hawai'i Hazard Evaluation and Emergency Response Office.

Cleanup efforts following accidental transformer oil release in 2021

3.7 Terrestrial Surveillance Program

The Terrestrial Surveillance Program is designed to address DOE O 458.1 Admin Change 3, *Radiation Protection of the Public and the Environment*. Terrestrial Surveillance Program personnel collect environmental media (soil) samples at SNL/KTF approximately every five years. SNL/KTF operations do not (currently or in the past) involve radioactive materials, therefore, radiological constituents are not analyzed. As a best management practice, soil samples are analyzed for metals at site-specific locations. Sampling began at SNL/KTF in 1994 and continued in 1999, 2002, 2007, 2012, and 2018. Sampling activities were not conducted in 2021. Details of the Terrestrial Surveillance Program and previous sampling results can be found in earlier annual site environmental reports.

3.8 Water Quality and Environmental Release, Response, and Reporting Programs

Water quality-related programs at SNL/KTF ensure compliance with local, state, and federal requirements. There are no drinking water or groundwater monitoring wells at SNL/KTF. All drinking water at SNL/KTF is supplied by the Pacific Missile Range Facility public water system.

SNL/KTF Environmental Release, Response, and Reporting Program personnel are contacted in the event of any spilling, leaking, pouring, emitting, emptying, discharging, injecting, pumping, escaping, leaching, dumping, or disposing of material into the environment, which may include (but is not limited to) soil, water, air, and drain systems. A set of procedures provides specific instructions for reporting an environmental release and for developing an accurate report. Environmental Release, Response, and Reporting Program personnel implement the procedures for and document all aspects of an environmental release and report on chemical use to ensure compliance with federal, state, and local reporting requirements.

3.8.1 Events Reported to the Hawai‘i Environment Department

In 2021, a release of an estimated 20 gallons of non-PCB transformer oil was reported to the Hawai‘i Hazard Evaluation and Emergency Response Office (see Section 3.6).

3.8.2 Events Categorized as a DOE Reportable Occurrence

In 2021, one release to the environment, the transformer oil, was reported to outside agencies that met the criteria for DOE-reportable occurrences under DOE O 232.2A, Chg 1 (MinChg), *Occurrence Reporting and Processing of Operations Information* (see Chapter 2 and Section 3.6).

3.8.3 Stormwater Program

Stormwater runoff at SNL/KTF is directed into four area drains with pumping systems. Stormwater permits, inspections, and sampling are not required for normal operations.

New construction activities that exceed one acre of soil disturbance require permitting under the Construction General Permit. No construction activities required permit coverage during 2021.

Wastewater is the spent or used water from a home, community, farm, or industry that contains dissolved or suspended matter.

3.8.4 Wastewater Discharge Program

Activities at SNL/KTF produce only sanitary sewage, which is directed into three DOE-owned and state-registered septic tanks; all the tanks are currently in use and do not impact any protected waters. The first septic tank was built in 1965 and was replaced in 2004. Two additional septic tanks were built in 1990 to serve other areas. The septic tank systems are pumped periodically and are inspected by licensed, state-certified contractors. During 2021, all three septic tank systems were inspected with one tank being pumped. There were no wastewater sampling events in 2021.

Chapter 4. Ecology Program

Hawai'ian goose (*Branta sandvicensis*)

OVERVIEW ■ Ecology Program personnel help operations comply with wildlife regulations and laws by providing biological evaluations and surveys in support of site activities. Ecological data is collected on plants and wildlife to support documentation, land use decisions, and ecological and wildlife awareness campaigns to ensure safe work environments and sustainable decision-making strategies.

Ecology Program personnel support site activity and project compliance with wildlife and vegetation requirements by conducting biological evaluations and surveys. Ecological compliance promotes conservation through the protection of native wildlife and their habitats. Ecology Program personnel conduct limited biological surveys at SNL/KTF.

The introduction of non-native species coupled with human development across the Hawai'ian Islands' small footprint has made many island species disproportionally rare compared to continental species. Numerous species on the island of Kaua'i are protected by the Endangered Species Act. Many of these are forest species for whom SNL/KTF provides little or no suitable habitat. These species would not likely occur at SNL/KTF; however, their historical or future occurrence at SNL/KTF cannot be ruled out. Other species listed as endangered or threatened are known to occur in the general SNL/KTF area and have been recorded on-site occasionally. The lowlands of Kaua'i are home to other endemic, indigenous, and migratory birds, which are all protected under the Migratory Bird Treaty Act. The Endangered Species Act and Migratory Bird Treaty Act lists of protected species is presented in Section 4.3.

In 2014, the U.S. Navy prepared a biological assessment (U.S. Navy 2014) of the potential for Pacific Missile Range Facility infrastructure, operations, and maintenance to affect listed species (DOE/NNSA 2019). The infrastructure and activities conducted at SNL/KTF were included. The assessment was submitted to the USFWS with a request for formal consultation. The USFWS issued a biological opinion in September 2014.

In 2018, the biological assessment for the effects of base-wide infrastructure, operations, and maintenance was revised and submitted to the USFWS due to exceeding the maximum allowable take for the Newell's shearwater (U.S. Navy 2018). USFWS issued a biological opinion for the Pacific Missile Range Facility (USFWS 2018) and for SNL/KTF as a tenant. These biological opinions contain measures to minimize take on Newell's shearwater (*Puffinus newelli)* caused by artificial lighting and collisions with communication towers.

The National Nuclear Security Administration submitted a biological evaluation for launch activities at SNL/KTF in June 2021 (DOE/NNSA/SFO 2021). This evaluation reviewed potential impacts to protected species resulting from SNL/KTF launch activities. The USFWS response concurred with the determination that a proposed project may affect but is not likely to affect listed species in the area adversely when specified avoidance and minimization measures are implemented (USFWS 2021).

A Protected Species Management Plan was developed in 2013 for SNL/KTF to describe procedures that SNL/KTF personnel would take to address potential impacts from operations and activities on protected species that are known to occur in the area. All mitigation measures and terms and conditions from USFWS biological opinions are incorporated in this Protected Species Management Plan.

4.1 Vegetation

Evolving on an isolated subtropical archipelago, the native plants of the Hawai'ian Islands are both unique and diverse. Kaua'i is the oldest of the main Hawai'ian islands and contains many endemic plant species. A vast portion of the western side of Kaua'i, from Waimea to Polihale, once contained an expansive wetland habitat. This region, known as the Mānā Plain, was drained and converted to agricultural lands in the early 1900s. With this drastic transformation, the introduction of numerous invasive plant species shaped the current landscape of the Mānā Plain where SNL/KTF is located. Some aquatic habitats can still be found in the form of man-made ditches and reservoirs.

Seven vegetation types are recognized on the undeveloped portions of the Pacific Missile Range Facility, which include SNL/KTF: kiawe/koa-haole scrub, a`ali`i-nama scrub, pohinahina, naupaka dune, strand, drainage-way wetlands, and ruderal (plant species that are first to colonize disturbed areas) vegetation. Kiawe/koa-haole and a`ali`i-nama scrub are the dominant vegetation types in the undeveloped portions of the Pacific Missile Range Facility and SNL/KTF. Kiawe/koa-haole is the dominant vegetation type present in the relatively undisturbed areas of the sand dunes associated with SNL/KTF and Polihale State Park as well as along the cliff face in a restricted easement area. Because of off-highway vehicle restrictions, sand dune-related vegetation within the Pacific Missile Range Facility and SNL/KTF boundaries is less disturbed than vegetation in Polihale State Park. A well-developed native strand community exists along the shoreline. Common plants that inhabit the sandy beach habitat on Kaua'i include beach naupaka, pohinahina, pohuehue, milo, and hau.

The composition of the kiawe/koa-haole vegetation community can vary from pure stands of kiawe to pure stands of koa-haole or any combination of the two. The kiawe trees often attain a height of 45 feet or more. The understory is commonly koa-haole except where the kiawe trees form a canopy. The height of the koa-haole depends to a large degree on the presence or absence of the kiawe trees. Ground cover varies and may consist of pure stands of Guinea grass (*Panicum maximum*), lantana (*Lantana camara*), or clove basil (*Ocimum gratissimum*). However, the most common ground cover is mixed forbs (herbaceous flowering plants that are not a grass) and grasses.

The majority of SNL/KTF is occupied by an open, woody scrub or a ruderal community of plants that is mowed regularly. The open scrub community is comprised mostly of introduced species,

although there are some Hawai'ian taxa to be found along the roads. These are worthy of mention because, even in such highly disturbed areas as roadways, the native plants can and do persist. Taken together, the open scrub communities occupy most of the land area.

Two wetlands areas exist along parts of the coastline west of SNL/KTF. The USFWS has classified these areas as Marine System, Subtidal Subsystem, Reef Class, Coral Subclass, and Subtidal. There is also a wetlands area to the south of SNL/KTF along Nohili Ditch, which is classified as Riverine System, Lower Perennial Subsystem, Open Water/Unknown Bottom Class, Permanent, Non-Tidal, and Excavated. There is potential for aquatic vegetation types and accompanying waterbird species to be present on or near SNL/KTF property during wet periods. Ditches along the eastern edge of SNL/KTF and several reservoirs on the Mana Plain, including the Mana Base Pond near the entrance to the Pacific Missile Range Facility, serve as waterbird habitats and sanctuaries.

Two federally listed plant species have been observed north of, but not on, the Pacific Missile Range Facility. Ohai (*Sesbania tomentosa*), a spreading shrub, is a federally endangered species that has been observed in the sand dunes to the north of the Pacific Missile Range Facility in Polihale State Park and could potentially occur at SNL/KTF. Lau`ehu (*Panicum niihauense*), an endangered species of rare grass, has been observed near Queens Pond, also north of the Pacific Missile Range Facility (SNL/NM 2020a). Unoccupied critical habitat for lau`ehu has been established to the north and west of SNL/KTF.

Coconut palms (*Cocos nucifera*) on a Kaua'i hill

4.2 Wildlife

Evolutionary isolation has resulted in distinctive wildlife found only on the Hawai'ian archipelago. The birds, mammals, and reptiles that have been observed and documented at and near SNL/KTF are the result of Kaua'i's unique biogeography combined with the introduction of many exotic species.

4.2.1 Birds

More than 50 species of birds have been identified in the general Pacific Missile Range Facility area, although not specifically at SNL/KTF. Endemic species include: Hawai'ian coot (*Fulica alai*), Hawai'ian duck (*Anas wyvilliana*), Hawai'ian gallinule (formerly Hawai'ian moorhen) (*Gallinula galleta sandvicensis*), Hawai'ian petrel (*Petrodroma sandwichensis*), Hawai'ian short-eared owl (*Asio flammeus sandwichensis*), Hawai'ian stilt (*Himantopus mexicanus knudseni*), and Newell's shearwater. Common

introduced (non-native) species include the African silverbill (*Euodice cantans*), common myna (*Acridotheres tristis),* house sparrow (*Passer domesticus*), Java sparrow (*Lonchura oryzivora),* red-crested cardinal (*Paroaria coronata*), and zebra dove (*Geopelia striata*). Past wildlife surveys of birds and mammals conducted at SNL/KTF found 20 species of birds throughout the facility.

Bird species protected under the Migratory Bird Treaty Act that have been observed at SNL/KTF include the black-crowned night heron (*Nycticorax nycticorax*), brown noddy (*Anous stolidus*), great frigatebird (*Fregata minor*), Laysan albatross (*Diomedea immutabilis*), and ruddy turnstone (*Arenaria interpres)*. The Laysan albatross uses the lawn-like ruderal vegetation areas for courtship and nesting. Up to six pairs of Laysan albatross have been observed in the SNL/KTF area. Other species known to exist within or near SNL/KTF are band-rumped storm petrel (*Oceanodroma castro*), barn owl (*Tyto alba*), Pacific golden plover (*Pluvialis fulva*), sanderling (*Calidris alba*), wandering tattler (*Heteroscelus incanus*), and wedge-tailed shearwater (*Puffinus pacificus chlororyncus*).

An *exotic* species, which may be invasive or noninvasive, is not native to the environment.

Five of the bird species observed at SNL/KTF are federally listed as endangered: Hawai'ian coot, Hawai'ian duck, Hawai'ian gallinule, Hawai'ian petrel, and Hawai'ian stilt. In addition, Newell's shearwater and the Hawai'ian goose, both recorded at SNL/KTF, are federally listed as threatened. These species all have special protections under the Endangered Species Act as administered by the USFWS.

The Hawai'ian coot, Hawai'ian duck, Hawai'ian gallinule, and Hawai'ian stilt use wetlands habitat (such as the Nohili Ditch system, ditch systems along the eastern edge of SNL/KTF, and several reservoirs on the Mana Plain) for breeding, nesting, and feeding.

The Hawai'ian goose is currently listed as threatened after having been downlisted from endangered in 2019. The Hawai'ian goose is encountered frequently and regularly nests at the Pacific Missile Range Facility Main Base. While SNL/KTF lacks preferred nesting habitat for the Hawai'ian goose; because of crowding Sandia is aware the potential for species movement onto the facility. In addition, nonbreeding individuals are observed occasionally.

The Newell's shearwater is a pelagic (open sea) species that once nested on all the major Hawai'ian Islands. However, it has become extinct on the islands of Hawai'i, Maui, Molokai, and Oahu due to the introduction of the mongoose in the late 1800s. Kaua'i provides the last Hawai'ian habitat for this federally listed threatened species.

Newell's shearwaters nest during the spring and summer months (April to November) in the interior mountains of Kaua'i. Nestlings leave the breeding grounds in October and November, departing by themselves shortly after nightfall and heading for the open ocean, guided by the reflection of moonlight on the water. Being inexperienced and naturally attracted to bright lights, they have a tendency to collide with trees, utility lines, buildings, and automobiles. The most critical period when Newell's shearwaters might have flight accidents is one week before and one week after the new moon in October and in November.

The Hawai'ian petrel may traverse the area from their nesting grounds to the sea. Fledging of the Hawai'ian petrel occurs in October, slightly earlier than for the Newell's shearwater.

Mitigation measures that have been implemented to minimize fallout for the Newell's shearwater also benefit other protected seabirds that are susceptible to disorientation from artificial lighting. No fallout was reported on SNL/KTF in 2021.

4.2.2 Mammals

Thirteen species of mammals are known to occur on the island of Kauaʻi. Eleven of these species are exotic (Tomich 1986). Past surveys found mammal species such as feral dogs (*Canis lupus familiaris*), feral cats (*Felis catus*), and small rodents (*Muroidea* spp.) within SNL/KTF. Feral dogs are known to roam the areas around SNL/KTF. At least four species of rodents are expected to be present at SNL/KTF: house mouse (*Mus musculus*), Norway rat (*Rattus norvegicus*), Pacific rat (*Rattus exulans*), and roof rat (*Rattus rattus*). Introduced mammal species pose a serious threat to native wildlife, particularly birds. Hawaiʻi's native wildlife did not evolve with mammalian predators and therefore have few defensive traits.

Biota is the animal and plant life of a given region; *biotic* is relating to or resulting from living organisms.

The Hawaiʻian hoary bat (*Aeorestes semotus*) is protected under the Endangered Species Act as an endangered species. The species is most common in regions between sea level and 4,000 feet that receive 20 to 90 inches of rain per year. This bat species uses trees or, possibly, rock shelters for roosting (Baldwin 1950

U.S. Census Bureau. 2020. *Quick Facts.* Accessed May 2021. https://www.census.gov/quickfacts/). The Hawaiʻian hoary bat has been recorded at the Pacific Missile Range Facility, and it is known to feed offshore and to occur at the Polihale State Park north of SNL/KTF.

The humpback whale (*Megaptera novaeangliae*) is protected under the Marine Mammal Protection Act and is protected as an endangered species under the Endangered Species Act. It is a migratory species that winters in tropical waters near coasts and islands and spends summers in temperate or subtropical waters (Johnson and Wolman 1984).

The Hawaiʻian monk seal (*Monachus schauinslandi*) is protected under the Marine Mammal Protection Act, is protected as an endangered species under the Endangered Species Act, and is one of two mammals endemic to Hawaiʻi. Hawaiʻian monk seals use sandy beaches to give birth and use vegetation behind beaches for shelter. Hawaiʻian monk seals are only occasionally reported around the main Hawaiʻian Islands (USFWS 2018), although they have been observed at the Pacific Missile Range Facility beaches (The Traverse Group 1988).

The false killer whale (*Pseudorca crassidens*) is protected under the Marine Mammal Protection Act and is protected as an endangered species under the Endangered Species Act. Large members of the dolphin family, they have been sighted off the west coast of Kauaʻi near the Pacific Missile Range Facility and were documented during a marine species survey in 2012 (NASA 2013). A final recovery plan for the main Hawaiʻian Islands insular false killer whale distinct population segment was reviewed and adopted in 2021.

4.2.3 Reptiles

Of the five species of marine turtles listed on the Endangered Species Act that may occur near SNL/KTF, only one is commonly encountered. Currently, no listed terrestrial reptiles or amphibians are expected to occur within the vicinity of SNL/KTF.

The Pacific green sea turtle (*Chelonia mydas*) is protected under the Endangered Species Act as threatened. The species inhabits pelagic habitat as juveniles and benthic (deep sea) habitat around all the Hawaiʻian Islands as adults. Adult turtles are known to rest along ledges and in caves and to forage in shallow intertidal and subtidal waters around the main islands. The turtles use sandy beaches for nesting during the summer months. Hatchlings emerge between July and October.

Pacific green sea turtles occasionally nest at the southern end of the Pacific Missile Range Facility and north of Kokole Point (Balazs, Forsyth, and Kam 1987).

Pacific green sea turtles are known to use Barking Sands coastal waters for foraging and beaches for basking routinely. Pacific green turtles are commonly observed basking on the beach and in the waters at the Nohili Ditch outfall, often referred to as the Turtle Cove area. Green turtles have been documented nesting at Barking Sands frequently in recent years with nine confirmed nests laid between 2015 and 2020. Nests have been observed on the southern coast of Barking Sands and the beach near the southern end of the airfield. There is no shoreline within the SNL/KTF boundary.

The leatherback and hawksbill turtles are relatively rare and while there are no known reports of these species nesting near the Pacific Missile Range Facility, they have been reported in the open waters off Kauaʻi.

4.3 Federally Listed and State-Listed Threatened and Endangered Species

The purpose of the Endangered Species Act is to protect all animal, plant, and insect species that are federally listed as threatened or endangered. Table 4-1 includes federally listed and state-listed threatened and endangered species 4that potentially occur or are confirmed to occur at SNL/KTF (SNL/NM 2020a).

Table 4-1. Federally listed and state-listed threatened and endangered species potentially occurring or confirmed at SNL/KTF

Common Name	Scientific Name	Federal Status
Birds		
Band-rumped storm petrel	*Oceanodroma castro*	Endangered
Hawaiʻian black-necked stilt	*Himantopus mexicanus knudseni*	Endangered
Hawaiʻian coot	*Fulica americana alai*	Endangered
Hawaiʻian duck	*Anas wyvilliana*	Endangered
Hawaiʻian gallinule	*Gallina galleta sandvicensis*	Endangered
Hawaiʻian goose	*Branta sandvicensis*	Threatened
Hawaiʻian petrel	*Petrodoma sandwichensis*	Endangered
Newell's Townsend's shearwater	*Puffinis auricularis newelii*	Threatened
Short-tailed albatross	*Phoebastria albatrus*	Endangered
Mammals		
False killer whale	*Pseudorca crassidens*	Endangered
Hawaiʻian hoary bat	*Lasiurus cinereus semotus*	Endangered
Hawaiʻian monk seal	*Monachus schauinslandi*	Endangered
Humpback whale	*Megaptera novaeangliae*	Endangered
Reptiles		
Hawksbill turtle	*Eretmochelys imbricata*	Endangered
Leatherback turtle	*Dermochelys coriacea*	Endangered
Loggerhead turtle	*Caretta caretta*	Endangered
Olive Ridley turtle	*Lepidochelys olivacea*	Threatened
Pacific green sea turtle	*Chelonia mydas*	Threatened
Plants		
Lauʻehu	*Panicum niihauense*	Endangered
Ohai	*Sesbania tomentosa*	Endangered

Chapter 5. Cultural Resource Management Program

Dock area, Kauaʻi Test Facility (Photo by Joseph M. Bonaguidi)

OVERVIEW ■ Cultural Resource Management Program personnel coordinate cultural resource compliance, including review of archaeological sites and historic buildings. Actions that could affect cultural resources adversely are analyzed initially in a NEPA checklist review. DOE is responsible for ensuring that impacts on cultural resources are assessed and appropriate actions are taken to mitigate those impacts.

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 an area and its landscape are maintained. Long-term preservation and protection practices also ensure that data are available to make proper land use decisions and to assist with environmental planning. The Cultural Resource Management Program is composed of two main parts: archeological resources and historic buildings.

Cultural resources are places and physical evidence of past human activity: a site, an object, a landscape, a structure, or a natural feature of significance to a group of people traditionally associated with it.

Approximately six archaeological surveys were conducted between 1976 and 2021 at SNL/KTF. Monitoring of all construction activities is required in the areas from Kekaha to the south and Polihale to the north of the Pacific Missile Range Facility, as well as in intermediate areas.

5.1 Cultural History

Three major historical periods are used to define traditions on Kauaʻi: Pre-Contact Period (circa AD 450–1778) to Early Historic Period (AD 1778–1800), Contact Period (AD 1778–1850), and Māhele Period (AD 1830–1870).

Much of the knowledge regarding traditional land use patterns at SNL/KTF is based on what was recorded at the time of, and shortly after, Western contact. Early records (such as journals kept by travelers and missionaries) documented Hawaiʻian traditions from that time, and archaeological investigations have assisted with understanding the past. Kauaʻi consists of six *moku* (land divisions that section off portions of the island): Kona, Puna, Koʻolau, Haleleʻa, Napali, and Waimea (Moffat and Fitzpatrick 1995). *Ahupuaʻa* (smaller land divisions within the moku) incorporate the natural resources necessary for traditional subsistence strategies. SNL/KTF is located in the ahupuaʻa of Waiawa, which is in the Kona moku of Kauaʻi.

A *moku* is a land division that sections off portions of the island.

Previous archaeological work outside of SNL/KTF but at nearby Barking Sands on the Mānā Plain led to the identification of prehistoric habitation and multiple types of features made by and utilized by humans (i.e., a fire pit, bedrock mortars, and shelters). Archaeological and historical records of the area revealed that Native Hawaiʻians used five environmental zones during traditional (Contact and Māhele) times in the western region of Kauaʻi: coastal and beach dunes, marshlands, cliff slopes, valleys, and upper mountain slopes. Archaeological studies along the coast and further inland revealed habitation, religious sites, and agricultural sites that date from AD 1120–1310 (Sweeney 1994).

5.2 Historical Context

Private plane pilots used a pasture near Barking Sands, Kauaʻi, as a landing field in the 1920s. In 1928, the Territorial Aeronautical Commission had the area surveyed and took control of the field. One of three landing fields on Kauaʻi, the Barking Sands Landing Field (also identified as Mana Airport), was intended as a stopover for transpacific flights.

Prior to the United States' involvement in World War II, the military improved and expanded the facilities at Barking Sands. Both the U.S. Army and the U.S. Navy used the site during the war, acquiring additional land and building up the facilities.

The U.S. Air Force took over Barking Sands in 1948, renaming it Bonham Air Force Base. In 1954, Bonham Air Force Base was declared excess, although no disposal action was taken. In 1962, the Atomic Energy Commission obtained permission for Sandia to use space at Bonham to set up a rocket-launching facility in support of the Operation Dominic nuclear test series based in the Pacific at Christmas and Johnston islands. Sandia engineers surveyed the site and planned for 40 launchpads. Subsequently, the Navy leased the Bonham Air Force Base, which was then transferred from the Air Force to the Navy in 1966. It is now known as the Pacific Missile Range Facility, a 7.5-mile-long, 0.5-mile-wide strip of coastal land.

Meant to be temporary, Sandia's site was used to launch diagnostic rockets to support analysis of Operation Dominic's high-altitude nuclear shots. Sandia personnel were able to launch instrumentation rockets simultaneously with small rockets launched from Johnston Island 700 miles away.

Sandia operations in Kauaʻi were expected to end after Operation Dominic. However, when ratifying the 1963 Limited Test Ban Treaty, the U.S. Congress placed conditions—safeguards—on its approval. The United States needed to maintain a readiness to resume atmospheric nuclear testing

should another nation break the treaty or should the United States have an imperative to test nuclear weapons. As part of the support for this Readiness Program, Sandia maintained the test range on Kauaʻi, establishing a permit with the Navy to continue using the SNL/KTF site at the Pacific Missile Range Facility. The readiness requirement was dropped in the 1970s, but Sandia's well-established rocket-launching capabilities remained in demand at SNL/KTF.

5.3 Regulatory Criteria

Ensuring compliance with federal and state requirements supports the long-term preservation and protection of cultural resources, prevents mission delays, and maintains trust and a strong relationship with DOE and the Hawaiʻi State Historic Preservation Division. See Chapter 2.

5.4 Archaeological Resources

The Sandia archaeologist helps Sandia personnel and DOE maintain compliance with National Historic Preservation Act, Section 106, requirements. This ensures that (1) cultural resources and their historic and cultural heritage are preserved and protected and (2) data are available to make appropriate land use and environmental planning decisions at SNL/KTF.

Sandia's archaeologist reviews NEPA checklists that involve land disturbances and provides recommendations for monitoring field activities so archaeological resources are not impacted adversely. The archaeologist also makes site eligibility recommendations for inclusion in the National Register of Historic Places. In addition, the archaeologist ensures that local, native Hawaiʻian cultural resource management firms that are permitted to work in the area perform the archaeological work.

5.4.1 Field Methods

Local archaeological personnel who hold state-required permits to conduct archaeological work in Hawaiʻi at SNL/KTF are contracted to conduct surveys and monitor all work that will disturb land. In addition, the contracted archaeological personnel provide recommendations regarding the potential effect of proposed undertakings on prehistoric and historic properties. These include recommendations regarding a site's eligibility for nomination to the National Register of Historic Places for Cultural Properties and Historic Preservation and project mitigation.

The contracted archeological personnel write reports of findings and associated documentation and provide them to the Sandia archaeologist for review. The reports and associated documents are then provided to DOE, including a consultation letter addressed to the Hawaiʻi State Historic Preservation Officer, for review and use in consultation.

5.4.2 Archaeological Assessments and Analysis in 2021

In 2021, the Sandia archaeologist reviewed seven NEPA checklists for outdoor projects, which included launch and facility operations and a mobile ground station. Four projects had ground-disturbing activities, which required the use of an archaeological monitor for all the work. The archaeological monitoring was completed on-site by permitted, local Hawaiʻian archaeologists who meet the State of Hawaiʻi archaeological monitor requirements.

5.5 Historic Buildings

Since 2006, environmental planning and cultural resources management at SNL/KTF have included historic building assessments and compliance with National Historic Preservation Act, Section 106, requirements. The Sandia historian conducts historic building assessments and makes

recommendations to DOE regarding National Register of Historic Places eligibility for SNL/KTF properties.

5.5.1 Methods

Sandia's historian reviews the project details, reviews existing photographs of and documents about the facilities involved, conducts any additional research in the archives and building drawings collection to understand the property's past and current role in SNL/KTF operations, and evaluates the building's history. Note is made of any previous assessments and resulting determinations as to the property's eligibility for the National Register of Historic Places.

If there are any questions regarding proposed work and its potential impact on a property or properties, the historian discusses the matter with the project owner and the NEPA specialist. The project owner may submit renderings of the anticipated appearance of the property after work is completed, and the historian may suggest alternate locations, materials, or methods to avoid adverse effects on the property.

Once a property is understood in context, the historian makes a recommendation as to whether it is eligible for inclusion in the National Register of Historic Places, summarizing past determinations and any subsequent changes to the property. The historian also makes a recommendation as to whether proposed work will have an adverse effect on any historic properties or districts, including the property where the work is occurring. Information regarding the property, photographs, maps, a description of the proposed work, any impacts, and the overall recommendation on eligibility are captured on a Hawai'i Historic Resources Inventory form. The historian's recommendation and any indication of a need for further action are captured in the NEPA checklist subject matter expert review. The Historic Resources Inventory form and a consultation letter addressed to the Hawai'i State Historic Preservation Officer is submitted to DOE for review and use in consultation.

5.5.2 Previous Building Surveys, Assessments, and Determinations

The Sandia historian conducted a historic building survey of SNL/KTF in 2006. This survey serves as the basis for understanding the properties at the site and for generating Hawai'i Historic Resources Inventory forms as properties face renovation or demolition. No site-wide assessment or historic context statement (providing the framework for evaluating a property for historic significance) exists. No sitewide consultation has occurred.

For each project undertaken since 2006—including minor repair activities, large-scale renovations, and demolition—DOE, in consultation with the Hawai'i State Historic Preservation Office, has determined that the properties involved are not eligible for the National Register of Historic Places. This is largely because the SNL/KTF property has undergone significant modification (and removal) of key early facilities and no longer represents its historic Cold War and Readiness Program activities.

5.5.3 Historic Building Assessments in 2021

In 2021, the historian reviewed one SNL/KTF project. The proposed activity was to relocate the Remote Launch Operations Building to the SNL/KTF main compound. Work included alterations to the main dock in the compound. DOE concluded that the proposed work did not constitute an undertaking and posed no threats to any historic properties. No documentation was prepared, and the Hawai'i State Historic Preservation Officer was not consulted.

Chapter 6. Quality Assurance

Kaua'i sunset

OVERVIEW ■ Personnel in various programs collect environmental samples and analyze them for nonradiological constituents. Quality control samples are sent to contract laboratories to ensure that the samples meet statistically established control criteria or prescribed acceptance control limits.

Sandia personnel are responsible for implementing quality assurance for operations—as specified in ISO 9001:2015, *Quality Management Systems–Requirements*; DOE O 414.1D Change 2 (LtdChg), *Quality Assurance*, Attachment 1, "Contractor Requirements Document"; and 10 CFR 830, *Nuclear Safety Management*, Subpart A, "Quality Assurance Requirements"—via policy statements and processes, and by executing the actions specified in those policies and processes. Sandia management is responsible for ensuring the quality of the company's products; for assessing its operations, programs, projects, and business systems; and for identifying deficiencies and effecting continuous improvements.

6.1 Environmental Monitoring for Quality Assurance

Environmental monitoring (which includes sampling) is conducted in accordance with program-specific sampling and analysis plans, work plans, or quality assurance plans, which contain quality assurance elements for all Sandia locations including SNL/KTF. These documents meet applicable federal, state, and local requirements for conducting sampling and analysis activities. Personnel in various programs collect environmental samples and submit them for analysis of radiological and nonradiological constituents on a calendar-year basis unless noted otherwise.

Project sampling and analysis plans (or equivalent) include critical elements, such as procedures for collecting samples, preserving and handling samples, controlling samples, controlling laboratory quality, setting required limits of detection, controlling field quality, ensuring health and safety, setting schedules and frequency for sampling, reviewing data, determining data acceptability, and reporting.

6.1.1 Sample Management Office

Sample Management Office personnel provide guidance and sample management support for field activities. However, program leads are responsible for each program's overall adherence to and compliance with any sampling and analysis activity performed.

SNL/KTF personnel ship samples directly to off-site laboratories and may use contracted laboratories located in Kauai. For example, Terrestrial Surveillance Program soil samples are shipped from SNL/KTF directly to an off-site laboratory when sampling occurs.

6.1.2 Contract Laboratory Selection

All off-site commercial laboratories under contract are selected based on performance objectives, licenses and accreditations, and appraisals (pre-award assessments) as described in the *Quality Assurance Project Plan for the Sample Management Office* (SNL/NM 2019). All laboratories must employ EPA test procedures whenever possible; when these are not available, other suitable and validated test procedures are applied. Laboratory instruments must be calibrated in accordance with established procedures, methods, and the Sample Management Office Statement of Work for Analytical Laboratories (SNL/NM 2020b). All calibrations and detection limits must be verified before analyzing samples and reporting data. Once a laboratory has passed an initial appraisal and has been awarded a contract, Sample Management Office personnel are responsible for continuously monitoring laboratory performance to ensure that the laboratory meets its contractual requirements during annual audits.

Contracted laboratories perform work in compliance with the Sample Management Office Statement of Work for Analytical Laboratories. Contract laboratories are required to participate in applicable DOE and EPA programs for blind audit check sampling to monitor the overall accuracy of analyses routinely performed on SNL/KTF samples. These contract laboratories are required to participate in the DOE Mixed Analyte Performance Evaluation Program. Contract laboratories also participate in commercial vendor programs designed to meet the evaluation requirements given in the proficiency testing section (Chapter II) of the National Environmental Laboratory Accreditation Conference Standard (NELAC 2009).

6.1.3 Quality Control for Samples

Project-specified quality control samples are submitted to contract laboratories in order to meet project data quality objectives and sampling and analysis plan requirements. Various field quality control samples may be collected to assess the data's quality and final usability. Errors, some of which are unavoidable, can be introduced into the sampling process, including potential contamination of samples in the field or during transportation. In addition, sample results can be affected by the variability present at each sample location.

With each sample batch, laboratory quality control samples are prepared concurrently at defined frequencies and analyzed in accordance with established methods. Contract laboratory personnel determine the analytical accuracy, precision, contamination, and matrix effects associated with each analytical measurement.

Quality control sample results are compared either to statistically established control criteria or to prescribed acceptance control limits. Analytical results generated concurrently with quality control sample results within established limits are considered acceptable. If quality control analytical results exceed control limits, the results are qualified and corrective action is initiated if warranted, as defined in the Sample Management Office Statement of Work for Analytical Laboratories (SNL/NM 2020b). Reanalysis is then performed for samples in the analytical batch as specified in the Statement

of Work and contract laboratory procedures. Quality control sample summaries are included in analytical reports prepared by contract laboratory personnel.

6.1.4 Data Validation and Records Management

Sample collection, analysis request and chain of custody documentation, and measurement data are reviewed and validated for each sample collected. Analytical data reported by contract laboratories are reviewed to assess laboratory and field precision, accuracy, completeness, representativeness, and comparability with respect to each program's method of compliance and data quality objectives.

The data are validated at a minimum of three levels:

- The analytical laboratory validates data according to the laboratory's quality assurance plan, standard operating procedures, and client-specific requirements.
- Sample Management Office personnel review the analytical reports, corresponding sample collection, and analysis request and chain-of-custody documentation for completeness and laboratory contract compliance.
- A program lead reviews program objectives, regulatory compliance, and project-specific data quality requirements, and makes the final decision regarding the data's usability and reporting.

In addition to the three minimum validation levels, a technical assistance contractor may validate analytical data under direction of Sample Management Office personnel in accordance with applicable procedures and requirements. The purpose is to identify, through evaluation of supporting documentation, those monitoring results that do not meet the expected precision and accuracy of an analytical method. Terrestrial Surveillance Program data are validated by a technical assistance contractor providing this additional level of quality assurance.

All analytical data packages, analysis request and chain-of-custody documents, and data validation reports are submitted to a Sandia record depository for cataloging and storage in accordance with internal procedures, DOE requirements, and the document control requirements of ISO 9001, *Quality Management*, and ISO 14001, *Environmental Management Systems*.

6.2 Sample Management Office Activities

Sample Management Office activities at SNL/KTF may include sample packaging, shipping, and tracking to off-site contracted laboratories by field personnel, and reviewing all data deliverables for compliance with contract and data quality requirements.

6.2.1 Sample Handling and Analyses

In 2021, no samples were collected for the Terrestrial Surveillance Program l at SNL/KTF.

Soil and residual oil samples were collected in 2021 as part of cleanup activities related to a release of transformer oil to the environment by an approved subcontractor. All samples were tested for PCBs and total petroleum hydrocarbons. Samples results were determined to be non-detect for PCBs and below applicable action levels for total petroleum hydrocarbons (see Section 3.6).

6.2.2 Laboratory Quality Assurance Assessments and Validation

Sample Management Office personnel participate in third-party independent assessments and validation of National Environmental Laboratory Accreditation Conference-approved laboratories for all Sandia locations. Specific checks were made for documentation completeness, proper equipment calibration, proper laboratory practices, and batch quality control data.

6.2.3 Quality Assurance Audits

The Sample Management Office participates in the DOE Consolidated Audit Program (DOECAP), which ensures that subcontracted commercial analytical environmental laboratories are audited on their ability to provide data results that are valid, reliable, and defensible. Commercial laboratories are to use the assessment process provided by one of three approved third-party accrediting bodies unless separate arrangements are made with DOECAP. The accrediting bodies conduct assessments using the requirements of the *DOD/DOE Consolidated Quality Systems Manual (QSM) for Environmental Laboratories* (DOD/DOE 2021).

In 2021, DOECAP and/or the accrediting bodies conducted assessments at eight contracted laboratories using *Quality Systems Manual* requirements. The audit reports, laboratory responses, and closure letters are all posted on and tracked through the DOECAP website. Decisions regarding sample distribution to contract laboratories were based on audit information, including corrective actions, if needed.

No findings for SNL/KTF samples were issued in 2021 in DOECAP assessment reports or other applicable DOE programs.

Glossary

Raccoon butterflyfish (*Chaetodon lunula*) off the coast of Kaua'i

A

abatement The act of reducing the degree or intensity of, or eliminating, pollution.

aboveground storage tank A fixed, stationary, or otherwise permanently installed storage tank that is wholly or partially above the ground surface and used to contain oil of any kind (petroleum, non-petroleum, synthetic, animal, or vegetable).

ambient air Any unconfined portion of the atmosphere (open air or surrounding air).

analyte A substance or chemical constituent undergoing analysis.

appraisal A documented activity performed according to written procedures and specified criteria to evaluate an organization's compliance and conformance with programs, standards, and other requirements contained in orders, laws, and regulations or in other requirements.

aquifer An underground geological formation, or a group of formations, containing water.

asbestos A mineral fiber that can pollute air or water and cause cancer or asbestosis when inhaled. Uses for asbestos-containing material include, but are not limited to, electrical and heat insulation, paint filler, reinforcing agents in rubber and plastics (e.g., tile mastic), and cement reinforcement.

aspect Any element of activities, products, or services that can interact with the environment.

audit (1) An examination of records or financial accounts to check their accuracy. (2) An adjustment or correction of accounts. (3) An examined and verified account.

B

basin (1) A low-lying area, wholly or largely surrounded by higher land, which ranges from a small, nearly enclosed valley to an extensive, mountain-rimmed depression. (2) An entire area drained by a given stream and its tributaries. (3) An area in which the rock strata are inclined downward from all sides toward the center. (4) An area in which sediment accumulates.

best management practice The preferred method or practice for managing operations.

biota The animal and plant life of a given region.

biotic Relating to or resulting from living organisms.

C

contamination The introduction into water, air, or soil of microorganisms, chemicals, toxic substances, wastes, or wastewater in a concentration that makes the medium unfit for its next intended use. Also applies to the surfaces of objects, buildings, and various household use and agricultural use products.

corrective action (1) Steps taken to clean up spills. The process includes designing cleanup procedures to guide hazardous waste treatment, storage, and disposal. (2) An action identified to correct a problem or prevent its recurrence.

D

data quality objective A strategic, systematic process for planning scientific data-collection efforts.

decontamination The removal of adverse substances such as noxious chemicals, harmful bacteria or other organisms, or radioactive material from exposed individuals, rooms and furnishings in buildings, or the exterior environment.

demolition The act or process of wrecking or destroying, especially destruction by explosives.

discharge Any liquid or solid that flows or is placed onto any land or into any water. This includes precipitation discharges to storm drains, accidental or intentional spilling, and leaking, pumping, pouring, emitting, emptying, or dumping any material or substance onto any land or into any water.

diurnal (1) Relating to or occurring in a 24-hour period; daily. (2) Occurring or active during the daytime rather than at night (e.g., diurnal animals).

dosimeter A device used to measure the dose of ionizing radiation.

E

ecology The relationship of living things to one another and their environment, or the study of such relationships.

ecosystem A network of living organisms (e.g., humans, animals, plants, and fungi) and nonliving components (e.g., air, water, mineral soil, buildings, and roads) that interact to comprise an overall environment.

effluent Wastewater (treated or untreated) that flows out of a treatment plant, sewer, or industrial outfall. Generally refers to wastes discharged into surface waters.

environment The sum of all external conditions affecting an organism's life, development, and survival.

environmental assessment An environmental analysis prepared pursuant to NEPA to determine whether a federal action would significantly affect the environment and thus require a more detailed environmental impact statement.

environmental impact statement A document required of federal agencies by NEPA for major projects or legislative proposals that significantly affect the environment. A tool for decision-making, it describes an undertaking's positive and negative effects and cites alternative actions.

environmental management A program designed to maintain compliance with federal, state, and local requirements.

Environmental Management System A continuing cycle of planning, evaluating, implementing, and improving processes and actions undertaken to achieve environmental goals.

environmental monitoring The collection and analysis of samples or direct measurements of environmental media such as air, water, and soil.

environmental release Any spilling, leaking, pouring, emitting, emptying, discharging, injecting, pumping, escaping, leaching, dumping, or disposing of material into the environment, which may include (but is not limited to) soil, air, and drain systems.

Environmental Restoration A project chartered with assessing and, if necessary, remediating inactive waste sites.

environmental restoration site Any location on the environmental restoration site list that has been identified as an area that is (or may be) contaminated—either on or beneath the land surface—as a result of operations. Contaminants may be chemicals, radioactive material, or both.

environmental surveillance A program that includes soil and vegetation surveys, water sampling, and analysis in an attempt to identify and quantify long-term effects of pollutants resulting from operations.

environment, safety, and health program A program designed to protect and preserve the environment and to ensure the safety and health of an organization's employees, contractors, visitors, and the public.

exotic species A species, which may be invasive or noninvasive, that is not native to the environment.

F

fault A fracture in the continuity of a rock formation caused by the earth's crust shifting or dislodging, after which adjacent surfaces are displaced relative to one another and parallel to the plane of fracture.

fauna (1) Animals, especially the animals of a particular region or period, considered as a group. (2) A catalog of the animals of a specific region or period.

flora (1) Plants considered as a group, especially of a particular region or period. (2) The plant life characterizing a specific geographic region or environment.

fungicide An agent that destroys fungi or inhibits their growth.

G

geology The scientific study of the Earth's origin, history, and structure.

greenhouse gas emission An air pollutant comprised of an aggregate group of six greenhouse gases: carbon dioxide, nitrous oxide, methane, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride measured as carbon dioxide equivalent.

groundwater The water found beneath the earth's surface in pore spaces and in fractures of rock formations.

H

habitat The place or environment where a plant or animal naturally or normally lives and grows.

hazardous substance (1) Any material that poses a threat to human health and/or the environment. Typical hazardous substances are toxic, corrosive, ignitable, explosive, or chemically reactive. (2) Any substance that EPA requires to be reported if a designated quantity of the substance is spilled in the waters of the United States or is otherwise released into the environment.

herbicide A chemical pesticide designed to control or destroy plants, weeds, or grasses.

I

impact Any change in the environment, whether adverse or beneficial, wholly or partially resulting from activities, products, or services.

insecticide A pesticide compound specifically used to kill or prevent the growth of insects.

Integrated Safety Management System A set of guidelines that systematically integrates safety into management and work practices at all levels so that missions are accomplished while protecting the worker, the public, and the environment.

L

lagoon (1) A shallow pond where sunlight, bacterial action, and oxygen work to purify wastewater; also used for storing wastewater. (2) A shallow body of water, often separated from the sea by coral reefs or sandbars.

M

migratory birds All birds listed within the Migratory Bird Treaty Act, 50 CFR 10.13, or which are a mutation or hybrid of any such species, including any part, nest, or egg.

Mixed Analyte Performance Evaluation Program A DOE quality assurance tool for environmental analytical services. It includes radiological, stable inorganic, and organic constituents (i.e., mixed analytes) in the same single-blind sample for analytical performance evaluation. The samples use various matrices, including soils, water, vegetation, and air filters. Program samples are not a mixed waste.

mixed waste Waste that contains both hazardous waste (as defined by RCRA and its amendments) and radioactive waste (as defined by the Atomic Energy Act and its amendments).

moku A land division that sections off portions of a Hawai'ian island.

N

National Environmental Policy Act The basic national charter for protecting the environment. It establishes policy, sets goals, and provides the means for carrying out the act.

natural resource A resource (actual or potential) supplied by nature.

O

occurrence Events or conditions that adversely affect, or may adversely affect, DOE (including the National Nuclear Security Administration) or contractor personnel, the public, property, the environment, or the DOE mission.

outfall The place where effluent is discharged into receiving waters.

P

pollutant Generally, any substance introduced into the environment that adversely affects the usefulness of a resource or the health of humans, animals, or ecosystems.

polychlorinated biphenyl A family of highly toxic organic chlorine compounds. Because of their persistence, toxicity, and ecological damage via water pollution, the manufacture of PCBs was discontinued in the United States in 1976.

potable water Water free from impurities present in quantities that are sufficient to cause disease or harmful physiological effects.

Q

quality assurance A system of procedures, checks, audits, and corrective actions to ensure that research design and performance, environmental monitoring and sampling, and other technical and reporting activities are of the highest achievable quality.

quality control A system used to determine analytical accuracy, precision, and contamination when samples are collected and to assess the data's quality and usability.

R

radioactive waste Any waste that emits energy as rays, waves, streams, or energetic particles. Radioactive materials are often mixed with hazardous waste from nuclear reactors, research institutions, or hospitals.

radionuclide A radioactive particle, man-made or natural, with a distinct atomic weight number.

reportable quantity A quantity of material, product compound, or contaminant that is reportable to a regulatory agency when released to the environment.

rodenticide A chemical or agent used to destroy rats or other rodent pests, or to prevent them from damaging food or crops.

ruderal The plant species that are first to colonize a disturbed area.

S

saltation The movement of hard particles such as sand over an uneven surface in a turbulent flow of air or water.

Sample Management Office A Sandia office where personnel manage environmental analytical laboratory contracts and assist with processing and tracking samples undergoing chemical and radiochemical analyses performed at these laboratories.

sampling and analysis plan A plan that contains criteria required for conducting sampling activities.

sediment Transported and deposited particles or aggregates derived from rocks, soil, or biological material.

soil All loose, unconsolidated mineral or organic materials on the immediate surface of the earth that support plant growth.

solid waste (1) Any garbage, refuse, or sludge from a waste treatment plant, water supply treatment plant, or air pollution control facility. (2) Any discarded material—including solid, liquid, semisolid, or contained gaseous material—resulting from industrial, commercial, mining, or agricultural operations or from community activities.

stormwater Water runoff from rainfall or snowmelt, including that discharged to the sanitary sewer system.

surface water Water that has not penetrated much below the surface of the ground.

sustainability Those actions taken to maximize energy and water efficiency; minimize chemical toxicity and harmful environmental releases, particularly greenhouse gas; promote renewable and other clean energy development; and conserve natural resources while sustaining assigned mission activities.

T

threatened or endangered species A species present in such small numbers that it is at risk of extinction.

topography The physical features of a surface area, including relative elevations and the position of natural and man-made features.

toxic chemical Any chemical listed in EPA regulations under "Emergency Planning and Community Right-to-Know Act of 1986–Section 313: Guidance for Reporting Toxic Chemicals."

U

underground storage tank A storage tank installed completely below the ground surface, covered with earth, and used to contain oil of any kind (petroleum, non-petroleum, synthetic, animal, or vegetable).

V

vegetation Plant life or the total plant cover of an area.

W

waste management A method for dealing with the waste from humans and organisms, including minimizing, handling, processing, storing, recycling, transporting, and final disposal.

wastewater The spent or used water from a home, community, farm, or industry.

water pollution The presence in water of enough harmful or objectionable material to damage the water's quality.

watershed A region or area bounded peripherally by a divide and draining ultimately to a particular watercourse or body of water.

wetland An area that is saturated by surface water or groundwater, having vegetation adapted for life under those soil conditions, such as swamps, bogs, fens, marshes, and estuaries.

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