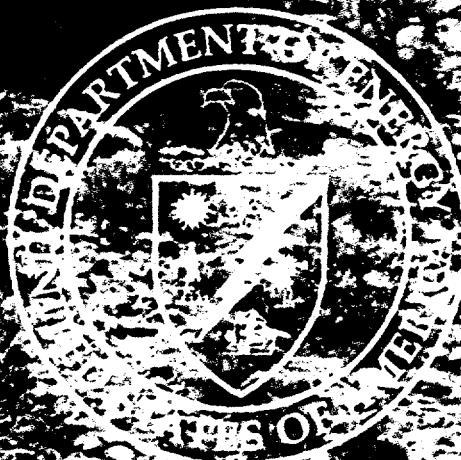


**RADIOLOGICAL EFFLUENTS RELEASED
FROM U.S. CONTINENTAL TESTS
1961 THROUGH 1992**



August 1996

**UNITED STATES DEPARTMENT OF ENERGY
NEVADA OPERATIONS OFFICE**

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Pictured on the front cover is a small herd of wild horses which roam the higher elevations of the Nevada Test Site. The Nevada Test Site is a bountiful wildlife preserve inhabited by a wide variety of animals ranging from kangaroo rats to mule deer, from centipedes to rattlesnakes, and from bats to golden eagles. No hunting is permitted on the Nevada Test Site, and any employee who purposely harms an animal there faces dismissal.

**RADIOLOGICAL EFFLUENTS RELEASED FROM
U.S. CONTINENTAL TESTS 1961 THROUGH 1992**

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August 1996

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ABSTRACT

This report documents all continental tests from September 15, 1961, through September 23, 1992, from which radioactive effluents were released. The report includes both updated information previously published in the publicly available May 1990 report, DOE/NV-317, Radiological Effluents Released from Announced U.S. Continental Tests 1961 through 1988, and effluent release information on formerly unannounced tests.

General information provided for each test includes the date, time, location, type of test, sponsoring laboratory and/or agency or other sponsor, depth of burial, purpose, yield or yield range, extent of the release (onsite only or offsite), and category of release (detonation-time versus posttest operations). Where a test with simultaneous detonations is listed, location, depth of burial and yield information are given for each detonation if applicable, as well as the specific source of the release, if available.

A summary of each release incident by type of release is included. For a detonation-time release, the effluent curies are expressed at R+12 hours. For controlled releases from tunnel tests, the effluent curies are expressed at both time of release and at R+12 hours, if available. All other types are listed at the time of the release. In addition, a qualitative statement of the isotopes in the effluent is included for detonation-time and controlled releases, if available, and a quantitative listing is included for all other types.

Offsite release information includes the cloud direction, the maximum activity detected in the air offsite, the maximum gamma exposure rate detected offsite, the maximum iodine level detected offsite, and the maximum distance radiation was detected offsite. An explanation of how these categories are defined (for the purpose of this report) is found in the introductory text.

A release summary includes whatever other pertinent information is available for each release incident. This document includes effluent release information for 433 tests, some of which have simultaneous detonations. However, only 52 of these are designated as having offsite releases.

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INTRODUCTION

In May 1990, the U.S. Department of Energy (DOE) published the report Radiological Effluents Released from Announced U.S. Continental Tests, 1961 through 1988 (DOE/NV-317). The purpose of that report was to inform the public of all releases of radioactive effluent associated with the U.S. underground nuclear testing program. At that time, not all underground nuclear tests and none of the simultaneous detonations had been announced to the public; therefore, those release data could not be published.

In December 1993 and June 1994, the Secretary of Energy declassified information related to previously unannounced nuclear weapons tests and simultaneous detonations associated with nuclear weapons tests. This information also provided the definition (in language of the Threshold Test Ban Treaty) of a nuclear test conducted at the Nevada Test Site (NTS), and therefore differentiated a detonation from a test. A detonation is a single nuclear explosion, while a test can be a single or multiple nuclear explosion where specific parameters are defined in the treaty. The complete definitions are found in the Glossary of this report.

This revision of DOE/NV-317 provides information on the radiological releases of the previously unannounced tests and simultaneous detonations. In some instances, information has been updated for previously announced tests that had simultaneous detonations. Thirteen additional previously announced tests, not included in the May 1990 report, were determined to have released effluents upon further review of test data by the sponsoring laboratory. These tests have been included in this revision.

HISTORICAL AND BACKGROUND INFORMATION

The United States began testing nuclear explosive devices on July 16, 1945, near Alamogordo, New Mexico. Following the conclusion of World War II, the U.S. initiated several test series in the Pacific and, beginning in 1951, in the continental U.S. The U.S. entered into a unilateral testing moratorium on October 1, 1958. On September 15, 1961, the U.S. resumed testing. Prior to the moratorium, the majority of tests were conducted in the atmosphere. Following the resumption of U.S. nuclear testing, 824 nuclear tests have been conducted within the boundaries of the U.S. Most of these tests were detonated underground with the anticipation that radioactivity generated by these tests would be totally or largely contained within the earth's surface. This report describes all tests since 1961 that released radioactive effluent into the atmosphere. A compilation of all U.S. nuclear tests is contained in DOE/NV-209 (Rev. 14) United States Nuclear Tests, July 1945 through September 1992.

In 1992, the U.S. Congress imposed a moratorium on nuclear testing that has been maintained by the President. There have not been any nuclear tests conducted by the U.S. since September 1992. This report is a complete documentation of radioactive releases resulting from nuclear tests in the continental U.S. from 1961 through September 1992. Radioactive releases from underground nuclear tests prior to 1961 were insignificant when compared to the radioactivity released from atmospheric tests during that time period.

TEST RELEASE CATEGORIES

From September 15, 1961, through September 23, 1992, the DOE and its predecessor agencies conducted 824 nuclear tests at the NTS and other U.S. continental locations. All the tests were conducted underground except for those that were surface or near-surface tests. These included Plowshare cratering tests, Department of Defense (DoD) tests (Operation Sunbeam and others), and storage-transportation tests (Operation Roller Coaster).

During the period of nuclear testing before the Limited Test Ban Treaty (LTBT) was signed (i.e., from September 15, 1961, to August 5, 1963), no specific test containment design criteria existed. Therefore, while radioactive effluents released from underground tests conducted during this period were not always expected, any effluent releases that did occur were not considered accidental, or even unexpected. After August 5, 1963, when the LTBT was signed and design criteria had been formally established, all tests (except four Plowshare cratering tests) were designed to be completely contained underground. Of these 723 tests, only 105 were actual failures of containment design. Operational releases, such as those identified as controlled, drillback, gas sampling, mudpit or from cementback operations, occurred from 287 tests that included simultaneous detonations. There were also 32 operational releases from pre-LTBT tests. There were another five tests where late-time seepage occurred; these releases were considered neither accidental nor operational. Figure 1 shows a breakdown of the post-LTBT release categories. The numbers assigned to each of these categories account for multiple releases from some tests, and also reflect the numbers and categories from simultaneous detonations. The numbers also reflect the removal of one test (HAVARTI) that was reported in the initial DOE/NV-317 report published in May 1990. Upon further review by sponsoring-laboratory personnel, it was determined that no effluent was released from this test.

Very few of the tests or simultaneous detonations resulted in particulate release with accompanying fallout of radioactive material, and only 52 (i.e., 6.3 percent of the 824 tests conducted in this period) released radioactivity that was detected by ground or aerial measurements made offsite. This document summarizes each of those 433 tests, some of which have simultaneous detonations, where any type of release was detected. Figure 2 shows the offsite versus onsite release information.

RADIATION MONITORING

Onsite

For every test, ground monitoring onsite was performed by the laboratory or agency conducting the test. These include Los Alamos National Laboratory (LANL), Lawrence Livermore National Laboratory (LLNL), Sandia National Laboratories (SNL), or the Defense Nuclear Agency (DNA) that is the testing organization within the DoD. In addition, Reynolds Electrical & Engineering Company, Incorporated (REECo), the onsite radiological support contractor, was responsible for operating the onsite monitoring equipment for every test.

For each test, radiation measurements began milliseconds after detonation, and continued until no apparent radiation hazard existed. If a release of radioactivity occurred, the first indications

of the occurrence, including the extent of the release and the direction the effluent was moving, were detections by the remote area monitoring system (RAMS). The RAMS consisted of an array of 30 to 40 permanent and a variable number of temporary (depending on the test) instrument stations that monitored gamma-ray exposure rates on the ground within the NTS.

Aerial monitoring was conducted onsite by REECO, the U.S. Air Force, the Environmental Protection Agency (EPA), and its predecessor, the Public Health Service (PHS). If a test release occurred, air support was available immediately to track the effluent in order to determine the size, radiation intensity levels, the rate of travel, and the trajectory of the cloud.

The onsite environmental monitoring program (where air, water, and external gamma exposure levels were constantly monitored) was conducted by REECO personnel. Air sample, thermoluminescent dosimeter (TLD), and water sample data were constantly analyzed to determine whether any increase in radiation levels occurred in a specific area because of delayed radiation releases.

Offsite

The EPA (or PHS) conducted the offsite ground monitoring program using gamma rate recorders, film badges or TLDs, air samplers, and portable monitoring equipment.

A network of over 100 permanent monitoring stations was established to maintain a continuous record of total radiation exposures outside the NTS. In addition, mobile monitoring units were deployed in the field depending upon the test and whether the effluent cloud trajectory was anticipated to travel offsite. Milk and water sampling stations were also established within a 300-mile radius of the NTS.

Offsite aerial monitoring and tracking operations were coordinated with onsite monitoring activities. After a detonation occurred, if effluent was detected by aircraft monitoring instruments, the EPA (or PHS) and the EG&G/EM Nevada Aerial Tracking System (NATS) were responsible for tracking the cloud and determining radiation intensity levels until no measurable radioactive effluent was detected.

RELEASE DESCRIPTION AND CLASSIFICATION

Each release has been categorized by type and has been defined for the purpose of this report. For some of the tests where multiple releases occurred, pertinent information on each release has been summarized, if available.

A "test" release (or an "uncontrolled" release for DoD tunnel tests) has been defined as a spontaneous release that occurred after a test but before postshot drilling operations began. This release definition also reflects the Containment Evaluation Panel (CEP) definition that states: "satisfactory containment will result in no radioactivity measurable offsite by normal monitoring equipment and no unanticipated release of radioactivity onsite." Therefore, test releases that did not meet the CEP definition were further categorized as pre-LTBT (i.e., before August 5, 1963), crater, surface, and near-surface tests. The pre-LTBT shaft and tunnel tests, where a sampling

conduit to the atmosphere was designed and placed in the test complex for sampling of the particulate matter released, have been defined as "test/prompt particle sampling" releases. The cratering Plowshare tests, where the test was designed to produce a throw-out of earth, have been designated as "test/crater" releases. Releases from surface tests have been categorized as "test/surface." Those surface and near-surface tests, that were non-nuclear tests designed to determine the extent of debris scattering, have been defined as "test/plutonium dispersal" releases. Test release quantity has been normalized to R+12 hours. This value represents the quantity of radioactive material remaining after decaying 12 hours from the time of release, and provides a measure of offsite exposure resulting from a radioactive release consisting of isotopes with widely varying half-lives. Values have been reported to two significant figures, and include a qualitative isotopic breakdown, if available.

"Controlled" releases were usually planned, filtered, tunnel-related releases. This type of postshot release was passed through a high efficiency, particulate air filter and charcoal filter combination where most of the particulates were removed from the escaping gases before these gases were vented from the tunnel into the atmosphere. Purging of the tunnels was required because health and safety considerations prevented reentry into the test area until airborne radiation levels were such that exposure to personnel would be minimal. Controlled releases also occurred from shaft tests, but these were infrequent. These data, listed at both time of release and at R+12 hours, if available, and estimated to two significant figures, reflect the effluent curies released to the atmosphere through the tunnel ventilation system. A qualitative isotopic breakdown is reported, if available.

"Drillback" releases occurred during postshot drilling operations to recover samples; these releases were either filtered or unfiltered. After drillback operations were completed, a "cementback" occurred where the drill hole was sealed with a plug and cemented to the surface. Releases during cementback operations were monitored by air sampling equipment. These release data have been listed at the time of release, estimated from the point of release and reported to two significant figures, when possible. A quantitative isotopic breakdown is reported, if available.

"Gas sampling" releases occurred during gas sampling operations, either before or after any postshot drilling operations commenced, depending on specific test circumstances. In most instances, these were controlled releases occurring when a determination had been made to reduce the volume of gas accumulated in a sampling tank. However, gas sampling releases also could have occurred as a result of equipment failure or other unexpected developments. These data have been listed in the same manner as drillback release data.

"Late-time seepage" releases occurred when noble gases have leaked from test sites after all operations in the area have ceased. These late-time releases were documented through the air sampling program that continually monitors radiation levels. This form of release is addressed in the NTS Environmental Impact Statement and is an anticipated phenomenon. These data have been reported in the same manner as drillback release data.

DATA FORMAT AND OFFSITE CATEGORY DESCRIPTIONS

The information listed below is given for each test in which a release occurred. However, for tests with simultaneous detonations, each individual detonation name, hole designation, depth of burial, and yield data are given, if applicable. If it is not known from which detonation the release occurred, all the detonation names that comprise the test are listed. Specific information includes the following items:

- The name, date, local time, and location (i.e., the Nevada Test Site or other continental locations, and the hole or tunnel designation).
- The type of test or simultaneous detonation (tunnel, shaft, crater, or surface).
- The extent of the release (i.e., whether the release was detected offsite or onsite only).

Special designation for onsite releases - Four tests, MINK, STOAT, HAYMAKER, and WICHITA, were designated to have had releases onsite only, even though after each of these tests, monitoring data indicated radioactivity in offsite areas. After further investigation, the DOE Test Authorities Liaison Office issued a memorandum on April 19, 1979, stating that these tests were not considered to have been detected offsite by the EPA. The reasoning for this determination was that at the time of these tests, weather data indicated that the prevailing wind directions made it extremely unlikely that radioactivity levels detected offsite were from any of these tests. More than likely, the source of the radioactivity detected was the result of foreign tests conducted during that time.

Qualitative onsite release data - Four tests, MAD, STILLWATER, CODSAW, and SACRAMENTO, are documented to have had "slight" test releases because monitoring techniques in use at that time did not provide quantitative release data. A reference document states that prior to October 1963, it is estimated that a total undetected release of up to 1,000 curies would be possible. This applies to volatiles and noble gases only, as undetected particulate releases would be much less. Subsequent to that time, undetected releases of up to five curies were possible.

- The laboratory and/or agency sponsoring the test. The acronym used denotes the name of the laboratory and/or agency at the time the test was conducted, i.e., LRL, LLL, LLNL, LASL, LANL, SC, SL, SNL, DoD, or laboratory acronym/UK. (See acronyms listing.)
- The depth of burial of the device(s).
- The purpose of the test or each of the detonations (i.e., weapons-related, weapons-effects, storage-transportation, Plowshare, Vela Uniform, safety experiment, or joint US-UK).
- The yield or yield range of the device(s), as listed in DOE/NV-209 (Rev. 14).

- The category of the release (i.e., test, operational [drillback, cementback, mudpit, and gas sampling], uncontrolled, controlled, late-time seepage, test/prompt particle sampling, test/crater, and test/surface).
- The data listed for releases detected offsite includes the following information, if available:

Isotopes identified in the release - a listing of the isotopes detected in the effluent released.

Cloud direction - the general direction and distance, if known, that EPA and/or NATS aircraft tracked the effluent cloud.

Maximum activity detected in air offsite - the geographical location and the data where the highest concentration of gross beta activity (expressed in picocuries per cubic meter of air; 1 picocurie = 1×10^{-12} curie) was detected. The samples were collected on air samplers (either at a permanent air sampling station or on a portable air sampler). These air samplers, strategically placed for a specific test, were fitted with glass fiber air filters and most had activated charcoal filters. Measurements were made at approximately one meter above ground level; this was considered to be the most accurate reading for a given location. Information is given for both populated and unpopulated areas, if available.

Maximum gamma exposure rate detected offsite - the geographical location and the data where the highest radiation exposure per unit of time was measured by a portable or stationary monitoring instrument. Measurements were made at approximately one meter above ground level.

Maximum iodine level detected offsite - the geographical location and the data where the highest concentration of iodine was measured in air by a monitoring instrument. The sample could have been collected on an air filter or an activated charcoal filter fitted on a permanent or mobile air sampler. Measurements were made at approximately one meter above ground level.

Maximum distance radiation detected offsite - the geographical location and the data at the greatest distance from the detonation where radiation was detected as measured by ground monitoring (i.e., radiation detection instruments, fallout trays, film badges, air samplers, or TLDs) or by aerial monitoring (i.e., data recorded on monitoring instruments in aircraft while tracking an effluent cloud).

- Quantitative isotopic information for operational releases, if available.
- A detailed release summary description, if available. This could include, but is not limited to, test venting information (both onsite and offsite); milk contamination as a result of fallout entering the food chain pathway (offsite); and operational postshot information (both onsite and offsite).
- Reference codes listed for each test identify information sources.

DOCUMENTATION

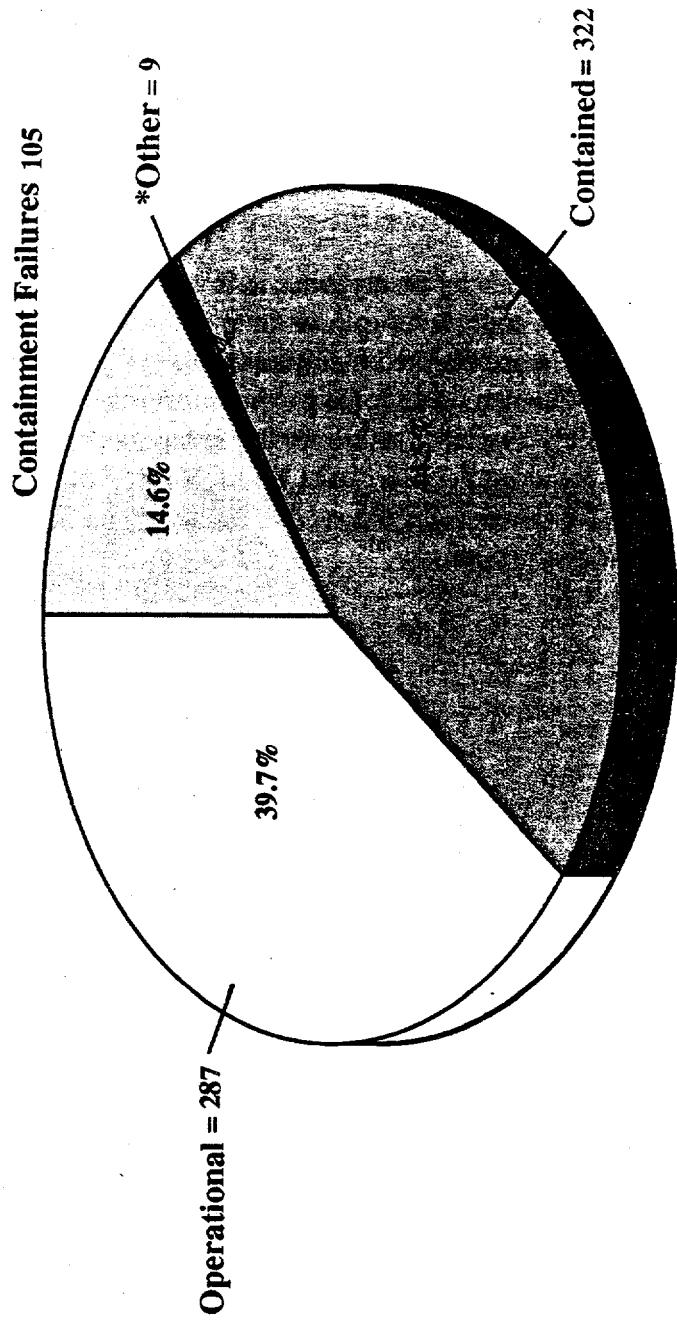
This report was compiled from the best information currently available. It has been reviewed by health and safety personnel from the DOE Nevada Operations Office (DOE/NV), the national laboratories, the Environmental Monitoring Systems Laboratory of the EPA, and DNA. Sometimes there are discrepancies between information compiled at different times by different individuals in estimating the magnitude of radiological releases; reporting yields and yield ranges; and detecting effluent releases at offsite locations. Source documents do vary, and therefore, some data found in this report may not agree with other DOE-published test data. This report reflects data referenced in this document and represents the current consensus of opinion of the subject matter experts from the above-mentioned agencies/laboratories.

All references, designated by an alphanumeric coding system appearing after each test summary, are listed in reference code order following the tests section of the report. Those references that are publicly available are denoted by an asterisk (*) following the citation. The classification of other references, if known, is denoted by the information within the brackets following the citation. All publicly available reference information can be obtained by contacting the DOE/NV Public Reading Facility, 2621 Losee Road, North Las Vegas, Nevada 89030. In addition, a glossary of terms, as they relate to this report, and a list of acronyms can be found after the reference information.

RELEASE CATEGORIES FOR TESTS CONDUCTED AT THE NTS AND OTHER CONTINENTAL LOCATIONS AFTER THE LIMITED TEST BAN TREATY (LTBT)

Total Tests Conducted Post-LTBT = 723

- Containment Failures
- *Other
- Contained
- Operational

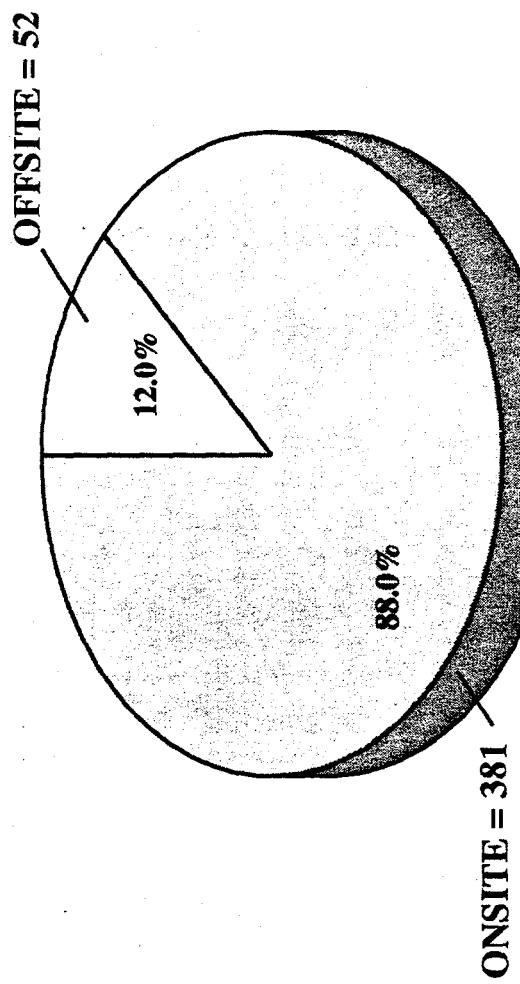


*Indicates late-time seepage and Plowshare/cratering

Figure 1. Release categories.

TEST RELEASE - OFFSITE VERSUS ONSITE 1961 -1992

OFFSITE ONSITE



Total Tests That
Released Effluent = 433

Figure 2. Offsite versus onsite releases.

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Test:	ANTLER		
Date:	09/15/61	Sponsor:	LLNL
Time:	1000 PST	Depth of Burial:	1,320 ft
Location:	NTS U12e.03	Purpose:	Weapons Related
Type:	Tunnel	Yield:	2.6 kt
Release Detected:	Offsite	Type of Release:	Test

Test Release at R+12 Hours, in Curies: 2.1×10^5

Isotopes Identified in the Release: ^{131}I , ^{133}I , ^{135}I , and $^{140}\text{Ba}/^{140}\text{La}$

Cloud Direction: Northerly over Highway 25, Reed, Diablo, and Warm Springs, Nevada

Maximum Activity Detected in Air Offsite: 28 picocuries of gross beta activity per cubic meter of air at Diablo, Nevada

Maximum Gamma Exposure Rate Detected Offsite: 12.5 mR/h at Twin Springs Ranch, Nevada

Maximum Iodine Level Detected Offsite: 1.4 picocuries of ^{131}I per cubic meter of air, 34 picocuries of ^{133}I per cubic meter of air, and 150 picocuries of ^{135}I per cubic meter of air at Diablo, Nevada

Maximum Distance Radiation Detected Offsite: 1.5 mR/h at 21.1 miles northeast of the junction of Highway 6 and Highway 25 (Nevada)

Release Summary: Venting occurred at the tunnel portal at H+2 seconds and lasted for an unknown duration. A secondary steam explosion was observed from eight to ten minutes following the detonation.

References: (A) (C) (E) (F) (G) (H) (AY) (DA) (GA)

Test:	SHREW		
Date:	09/16/61	Sponsor:	LASL
Time:	1145 PST	Depth of Burial:	325 ft
Location:	NTS U3ac	Purpose:	Weapons Related
Type:	Shaft	Yield:	Low
Release Detected:	Onsite Only	Type of Release:	Test

Test Release at R+12 Hours, in Curies: $4.9 - 4.9 \times 10^2$ (estimated)

Release Summary: This test released small visible quantities of radioactive steam and/or gases. The test release (probably from a sampling line) occurred before H+15 minutes and lasted for approximately two hours.

References: (A) (B) (E) (F) (H) (J) (AY) (DA)

Test:	BOOMER		
Date:	10/01/61	Sponsor:	LASL
Time:	1330 PST	Depth of Burial:	330 ft
Location:	NTS U3aa	Purpose:	Weapons Related
Type:	Shaft	Yield:	Low
Release Detected:	Onsite Only	Type of Release:	Test

Test Release at R+12 Hours, in Curies: $2.5 \times 10^1 - 2.5 \times 10^3$ (estimated)

Release Summary: A test release occurred at H+12 hours from the sampling line area. Small amounts of noble gas daughters were seen on 50-foot arc samplers and from samples taken by monitoring aircraft.

References: (B) (E) (H) (J) (AY)

Test:	CHENA		
Date:	10/10/61	Sponsor:	LRL
Time:	1000 PST	Depth of Burial:	840 ft
Location:	NTS U12b.09	Purpose:	Weapons Related
Type:	Tunnel	Yield:	Low
Release Detected:	Onsite Only	Type of Release:	Test

Test Release at R+12 Hours, in Curies: 7.6×10^2

Release Summary: Venting occurred at the tunnel portal at H+2 seconds and continued for approximately 20 minutes.

References: (A) (C) (E) (F) (H) (AY) (DA) (G1)

Test:	MINK		
Date:	10/29/61	Sponsor:	LASL
Time:	1030 PST	Depth of Burial:	630 ft
Location:	NTS U3ae	Purpose:	Weapons Related
Type:	Shaft	Yield:	Low
Release Detected:	Onsite Only*	Type of Release:	Test and Drillback

Test Release at R+12 Hours: Slight

Isotopes Identified in the Release: ^{131}I *

Cloud Direction: Southerly

Maximum Activity Detected in Air Offsite: 13 picocuries of gross beta activity per cubic meter of air at Indian Springs, Nevada**

Maximum Gamma Exposure Rate Detected Offsite: No radiation intensities above background levels were measured.

Maximum Iodine Level Detected Offsite: 720 picocuries of ^{131}I per liter in milk at Hiko, Nevada**

Maximum Distance Radiation Detected Offsite: No radiation intensities above background levels were measured.

Drillback Release Activity at Time of Release: Some

Release Summary: Some seepage was evident at H+25 minutes from the sampling line. Small amounts of noble gas daughters were seen on 50-foot arc air samplers, but no activity was detected from samples taken by monitoring aircraft.

Measurable contamination of offsite milk supplies was observed. Iodine-131 levels in milk at Hiko, Nevada, were 720 picocuries per liter four days after the test. Some radiation was detected in the areas surrounding surface ground zero from gaseous radioactivity released during postshot drilling. No radiation was detected off the NTS from postshot operations.

References: (A) (B) (E) (F) (H) (N) (AY) (DA) (EA) (GB)

*As of April 19, 1979, this test was considered to be an onsite only release. See statement in explanatory information on "special designation for onsite releases."

**This gross beta and iodine activity in the air and iodine-131 concentration in milk was attributed to Russian nuclear tests around the time of this test.

Test:	FISHER		
Date:	12/03/61	Sponsor:	LASL
Time:	1504 PST	Depth of Burial:	1,200 ft
Location:	NTS U3ah	Purpose:	Weapons Related
Type:	Shaft	Yield:	13.4 kt
Release Detected:	Onsite Only	Type of Release:	Test/Prompt Particle Sampling and Drillback

Test Release at R+12 Hours, in Curies: Less than 5.0×10^2 (estimated)

Drillback Release Activity at Time of Release: Some

Release Summary: This test released small visible quantities of radioactive steam and/or gases. The test release occurred from the area of a broken sampling line near surface ground zero at approximately H+7 minutes and lasted for about one to two hours.

Some radiation was detected in the area surrounding surface ground zero from gaseous radioactivity released during postshot drilling.

References: (A) (B) (E) (F) (H) (J) (AY) (DA)

Test:	GNOME		
Date:	12/10/61	Sponsor:	LRL
Time:	1200 MST	Depth of Burial:	1,185 ft
Location:	Carlsbad, NM	Purpose:	Plowshare
Type:	Shaft	Yield:	3.0 kt
Release Detected:	Offsite	Type of Release:	Test

Test Release at R+12 Hours: Release not quantified

Isotopes Identified in the Release: ^{131}I , ^{133}I , ^{135}I , ^{137}Cs , ^{140}Ba / ^{140}La , and noble gases

Cloud Direction: Northwesterly direction crossing over Highway 128 and Highway 31 (New Mexico)

Maximum Activity Detected in Air Offsite: 160 picocuries of gross beta activity per cubic meter of air at the IMCC Mine, New Mexico

Maximum Gamma Exposure Rate Detected Offsite: 1,400 mR/h at 3.5 miles west of the junction of Highway 31 and 128

Maximum Iodine Level Detected Offsite: Near Carlsbad, New Mexico, 1.7 picocuries of ^{131}I per cubic meter of air, 18 picocuries of ^{133}I per cubic meter of air, and 3.5 picocuries of ^{135}I per cubic meter of air at the IMCC Processing Plant

Maximum Distance Radiation Detected Offsite: 0.3 mR/h at Roswell, New Mexico

Release Summary: Radiation was detected at the blast door near the bottom of the shaft less than one minute following the explosion and at the shaft collar three minutes and 40 seconds after the detonation. At approximately seven minutes after the detonation, gray smoke, steam, and associated radioactivity surged from the shaft opening. By 11 minutes following the explosion, copious quantities of steam were issuing from both shaft and ventilation lines. A large flow continued for about 30 minutes before gradually decreasing. A small flow was still detected the following day. The radioactive elements that vented through the shaft were volatiles and noble gases.

References: (A) (E) (H) (AY) (DC)

Test:	MAD		
Date:	12/13/61	Sponsor:	LR
Time:	1000 PST	Depth of Burial:	600 ft
Location:	NTS U9a	Purpose:	Weapons Related
Type:	Shaft	Yield:	500 tons
Release Detected:	Onsite Only	Type of Release:	Test

Test Release at R+12 Hours: Slight

Release Summary: This test released small visible quantities of radioactive steam and/or gases. The test release occurred at H+20 minutes.

NOTE: See statement in explanatory information on "qualitative onsite release data."

References: (A) (C) (E) (F) (H) (AY) (DA)

Test:	RINGTAIL		
Date:	12/17/61	Sponsor:	LASL
Time:	0835 PST	Depth of Burial:	1,200 ft
Location:	NTS U3ak	Purpose:	Weapons Related
Type:	Shaft	Yield:	Low
Release Detected:	Onsite Only	Type of Release:	Test

Test Release at R+12 Hours, in Curies: Less than 1.0×10^1 (estimated)

Release Summary: This test released small visible quantities of radioactive steam and/or gases. The test release occurred from the sampling line between H+7 and H+25 minutes.

References: (A) (B) (E) (F) (H) (J) (AY) (DA)

Test:	FEATHER		
Date:	12/22/61	Sponsor:	LR
Time:	0830 PST	Depth of Burial:	812 ft
Location:	NTS U12b.08	Purpose:	Weapons Related
Type:	Tunnel	Yield:	150 tons
Release Detected:	Offsite	Type of Release:	Test

Test Release at R+12 Hours, in Curies: 3.8×10^2

Isotopes Identified in the Release: ^{103}Ru , ^{131}I , ^{133}I , ^{135}I , ^{140}La , and ^{141}Ce

Cloud Direction: Southwesterly over Death Valley Junction, California

Maximum Activity Detected in Air Offsite: 440 picocuries of gross beta activity per cubic meter of air at Bettie's Farm, Nevada

Maximum Gamma Exposure Rate Detected Offsite: 0.08 mR/h at Death Valley Junction, California

Maximum Iodine Level Detected Offsite: 290 picocuries of ^{133}I per cubic meter of air and 1,000 picocuries of ^{135}I per cubic meter of air at Bettie's Farm, Nevada

Maximum Distance Radiation Detected Offsite: 0.01 mR/h at 1.5 miles west to one mile south of Death Valley Junction, California

Release Summary: At H hour, a small cloud rose from the tunnel portal and vent pipes on top of the mesa and endured for 11 minutes.

Monitoring data showed the cloud traveled in a straight path on a heading of 190 degrees, passing just east of Carrara, Nevada. South of Carrara, the path changed to the southeast, passing over Death Valley Junction and eventually reaching Ash Meadows, Nevada.

References: (A) (C) (E) (F) (G) (H) (AY) (DA) (GC)

Test:	STOAT		
Date:	01/09/62	Sponsor:	LASL
Time:	0830 PST	Depth of Burial:	1,000 ft
Location:	NTS U3ap	Purpose:	Weapons Related
Type:	Shaft	Yield:	5.1 kt
Release Detected:	Onsite Only*	Type of Release:	Test/Prompt Particle Sampling and Drillback

Test Release at R+12 Hours, in Curies: 7.7

Isotopes Identified in the Release: Gaseous fission products

Cloud Direction: Southerly over Highway 95 (Nevada)

Maximum Activity Detected in Air Offsite: No fresh fission products were detected.

Maximum Gamma Exposure Rate Detected Offsite: No radiation intensities above background levels were measured.

Maximum Iodine Level Detected Offsite: Trace of ^{131}I in the air sample at Lathrop Wells, Nevada*

Maximum Distance Radiation Detected Offsite: By USPHS aircraft only over Highway 95, approximately 40 miles from surface ground zero*

Drillback Release Activity at Time of Release: Slight

Release Summary: A test release occurred at collapse time and lasted for approximately one minute from the sampling line. No radiation levels above background were detected off the NTS in populated areas from radioactivity released by this detonation. Radiation was detected off the Nevada Test Site approximately 40 miles from surface ground zero along Highway 95.

Some radiation was detected in the area surrounding surface ground zero from gaseous radioactivity released during postshot drilling.

References: (A) (B) (E) (F) (H) (N) (AY) (DA) (GD)

*As of April 19, 1979, this test was considered to be an onsite only release. See statement in explanatory information on "special designation for onsite releases."

Test:	DORMOUSE		
Date:	01/30/62	Sponsor:	LASL
Time:	1000 PST	Depth of Burial:	1,190 ft
Location:	NTS U3aq	Purpose:	Weapons Related
Type:	Shaft	Yield:	Low
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release: Some

Release Summary: Some radiation was detected in the area surrounding surface ground zero from gaseous radioactivity released during postshot drilling.

References: (A) (B) (E) (F) (H) (AY) (DA)

Test:	STILLWATER		
Date:	02/08/62	Sponsor:	LRL
Time:	1000 PST	Depth of Burial:	595 ft
Location:	NTS U9c	Purpose:	Weapons Related
Type:	Shaft	Yield:	3.07 kt
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release: Slight

Release Summary: Some radiation was detected in the area surrounding surface ground zero from gaseous radioactivity released during postshot drilling.

NOTE: See statement in explanatory information on "qualitative onsite release data."

References: (A) (C) (E) (F) (H) (AY) (DA)

Test:	ARMADILLO		
Date:	02/09/62	Sponsor:	LASL
Time:	0830 PST	Depth of Burial:	786 ft
Location:	NTS U3ar	Purpose:	Weapons Related
Type:	Shaft	Yield:	7.1 kt
Release Detected:	Onsite Only	Type of Release:	Test and Drillback

Test Release at R+12 Hours, in Curies: Less than 1.2×10^2 (estimated)

Drillback Release Activity at Time of Release: Some

Release Summary: A test release occurred from the surface ground zero area at H+3 minutes and lasted for ten minutes.

Some radiation was detected in the area surrounding surface ground zero from gaseous radioactivity released during postshot drilling.

References: (A) (B) (E) (F) (H) (J) (AY) (DA)

Test:	HARDHAT		
Date:	02/15/62	Sponsor:	DoD/SC/LASL
Time:	1000 PST	Depth of Burial:	950 ft
Location:	NTS U15a	Purpose:	Weapons Effects
Type:	Shaft	Yield:	5.7 kt
Release Detected:	Onsite Only	Type of Release:	Test and Drillback

Test Release at R+12 Hours: Late slight

Drillback Release Activity at Time of Release: Some

Release Summary: Seepage occurred through the tunnel stemming. Aircraft sampling from 1050 to 1230 hours PST on February 16, 1962, showed the presence of a cloud.

Some radiation was detected in the area surrounding surface ground zero from gaseous radioactivity released during postshot drilling.

References: (A) (B) (E) (F) (H) (L) (AY) (DA)

Test:	CHINCHILLA		
Date:	02/19/62	Sponsor:	LASL
Time:	0830 PST	Depth of Burial:	492 ft
Location:	NTS U3ag	Purpose:	Weapons Related
Type:	Shaft	Yield:	1.9 kt
Release Detected:	Onsite Only	Type of Release:	Test and Drillback

Test Release at R+12 Hours, in Curies: 2.0

Drillback Release Activity at Time of Release: Some

Release Summary: A test release (probably from the sampling line) occurred at H+1 minute and lasted for four minutes.

Some radiation was detected in the area surrounding surface ground zero from gaseous radioactivity released during postshot drilling.

References: (A) (B) (E) (F) (H) (AY) (DA)

Test:	CODSAW		
Date:	02/19/62	Sponsor:	LLNL
Time:	0950 PST	Depth of Burial:	696 ft
Location:	NTS U9g	Purpose:	Weapons Related
Type:	Shaft	Yield:	Low
Release Detected:	Onsite Only	Type of Release:	Test

Test Release at R+12 Hours: Slight

Release Summary: No early venting was detected.

NOTE: See statement in explanatory information on "qualitative onsite release data."

References: (A) (C) (E) (F) (H) (AY) (DA)

Test:	CIMARRON		
Date:	02/23/62	Sponsor:	LLNL
Time:	1000 PST	Depth of Burial:	1,000 ft
Location:	NTS U9h	Purpose:	Weapons Related
Type:	Shaft	Yield:	11.9 kt
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: 7.5×10^2

^{133}Xe in curies: 7.5×10^2

Release Summary: A drillback release from the postshot drill hole occurred on March 2, 1963, and lasted for 3.5 hours.

References: (A) (C) (E) (F) (H) (AY) (DA)

Test:	PLATYPUS		
Date:	02/24/62	Sponsor:	LASL
Time:	0830 PST	Depth of Burial:	190 ft
Location:	NTS U3ad	Purpose:	Weapons Related
Type:	Shaft	Yield:	Low
Release Detected:	Onsite Only	Type of Release:	Test

Test Release at R+12 Hours: Slight

Release Summary: A test release occurred from the surface ground zero area from H time until H+1 minute.

References: (A) (B) (E) (F) (H) (AY) (DA)

Test:	PAMPAS		
Date:	03/01/62	Sponsor:	LASL/UK
Time:	1110 PST	Depth of Burial:	1,200 ft
Location:	NTS U3al	Purpose:	Joint US-UK
Type:	Shaft	Yield:	9.5 kt
Release Detected:	Offsite	Type of Release:	Test/Prompt Particle Sampling and Drillback

Test Release at R+12 Hours, in Curies: 2.0×10^3

Isotopes Identified in the Release: ^{95}Nb , ^{103}Ru , ^{131}I , ^{133}I , ^{135}I , ^{140}La , and ^{141}Ce

Cloud Direction: Northeasterly over Highway 25 (Nevada)

Maximum Activity Detected in Air Offsite: 1,700 picocuries of gross beta activity per cubic meter of air at Penoyer, Nevada

Maximum Gamma Exposure Rate Detected Offsite: 0.22 mR/h at Penoyer, Nevada

Maximum Iodine Level Detected Offsite: 9 picocuries of ^{131}I per cubic meter of air, 220 picocuries of ^{133}I per cubic meter of air, and 350 picocuries of ^{135}I per cubic meter of air at Gunderson's Ranch, Penoyer, Nevada

Maximum Distance Radiation Detected Offsite: 0.08 mR/h at 17.7 miles north of Highway 25 in Sand Springs Valley, Nevada

Drillback Release Activity at Time of Release: Some

Release Summary: A test release occurred from a broken sampling line at zero time and lasted for 20 minutes. The release of radioactivity occurred with winds from the south carrying the cloud north on about a ten degree trajectory.

Some radiation was detected in the area surrounding surface ground zero from gaseous radioactivity released during postshot drilling.

References: (A) (B) (E) (F) (G) (H) (AY) (DA) (GE)

Test:	DANNY BOY		
Date:	03/05/62	Sponsor:	DoD/LRL
Time:	1015 PST	Depth of Burial:	110 ft
Location:	NTS U18a	Purpose:	Weapons Effects
Type:	Crater	Yield:	430 tons
Release Detected:	Offsite	Type of Release:	Test/Crater

Test Release at R+12 Hours, in Curies: 8.5×10^5

Isotopes Identified in the Release: ^{91}Sr , ^{103}Ru , ^{131}I , ^{133}I , ^{135}I , ^{132}Te , and $^{140}\text{Ba}/^{140}\text{La}$

Cloud Direction: Northerly over Highway 6, west of Warm Springs, Nevada

Maximum Activity Detected in Air Offsite: 1,000 picocuries of gross beta activity per cubic meter of air at Warm Springs, Nevada

Maximum Gamma Exposure Rate Detected Offsite: 3.2 mR/h 17.7 miles west of Warm Springs, Nevada

Maximum Iodine Level Detected Offsite: 6.9 picocuries of ^{131}I per cubic meter of air, 220 picocuries of ^{133}I per cubic meter of air, and 350 picocuries of ^{135}I per cubic meter of air at Warm Springs, Nevada

Maximum Distance Radiation Detected Offsite: 0.02 mR/h at Carver's Restaurant, Nevada

Release Summary: A persistent cloud was produced during the blow out crater formation containing appreciable quantities of radioactivity associated with particulates. The total release, at the time of release, was 1.4×10^{10} curies.

References: (A) (E) (F) (G) (H) (U) (V) (AY) (DA) (GE)

Test: ERMINE

Date:	03/06/62	Sponsor:	LASL
Time:	0830 PST	Depth of Burial:	240 ft
Location:	NTS U3ab	Purpose:	Safety Experiment
Type:	Shaft	Yield:	Low
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release: Some

Release Summary: Some radiation was detected in the area surrounding surface ground zero from gaseous radioactivity released during postshot drilling.

References: (A) (B) (E) (F) (H) (AY) (DA)

Test: BRAZOS

Date:	03/08/62	Sponsor:	LRL
Time:	1000 PST	Depth of Burial:	841 ft
Location:	NTS U9d	Purpose:	Weapons Related
Type:	Shaft	Yield:	8.4 kt
Release Detected:	Onsite Only	Type of Release:	Test/Prompt Particle Sampling and Drillback

Test Release at R+12 Hours, in Curies: 1.1×10^3

Drillback Release Activity at Time of Release, in Curies: 9.5×10^3

^{133}Xe in curies: 9.5×10^3

Release Summary: This test released small visible quantities of radioactive steam and/or gases. The test release occurred from the Rad-chem pipe at H time and lasted for 38 minutes.

A drillback release from the postshot drill hole occurred on March 12, 1962, and lasted for approximately seven hours.

References: (A) (C) (E) (F) (H) (AY) (DA)

Test:	HOGNOSE		
Date:	03/15/62	Sponsor:	LASL
Time:	0830 PST	Depth of Burial:	800 ft
Location:	NTS U3ai	Purpose:	Weapons Related
Type:	Shaft	Yield:	Low
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release: Some

Release Summary: Some radiation was detected in the area surrounding surface ground zero from gaseous radioactivity released during postshot drilling.

References: (A) (B) (E) (F) (H) (AY) (DA)

Test:	HOOSIC		
Date:	03/28/62	Sponsor:	LRL
Time:	1000 PST	Depth of Burial:	613 ft
Location:	NTS U9j	Purpose:	Weapons Related
Type:	Shaft	Yield:	3.4 kt
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: 1.0×10^4

^{133}Xe in curies: 1.0×10^4

Release Summary: A drillback release occurred from a postshot drill hole on April 13, 1962, and lasted for four days.

References: (A) (C) (E) (F) (H) (AY) (DA)

Test:	CHINCHILLA II		
Date:	03/31/62	Sponsor:	LASL
Time:	1000 PST	Depth of Burial:	458 ft
Location:	NTS U3as	Purpose:	Weapons Related
Type:	Shaft	Yield:	Low
Release Detected:	Onsite Only	Type of Release:	Test and Drillback

Test Release at R+12 Hours, in Curies: Less than 1.0×10^1

Drillback Release Activity at Time of Release: Some

Release Summary: The test release occurred from the surface ground zero area at H+4 minutes and lasted for approximately 30 minutes.

Some radiation was detected in the area surrounding surface ground zero from gaseous radioactivity released during postshot drilling.

References: (A) (B) (E) (F) (H) (AY) (DA)

DORMOUSE PRIME			
Date:	04/05/62	Sponsor:	LASL
Time:	1000 PST	Depth of Burial:	856 ft
Location:	NTS U3az	Purpose:	Weapons Related
Type:	Shaft	Yield:	10.6 kt
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release: Some

Release Summary: Some radiation was detected in the area surrounding surface ground zero from gaseous radioactivity released during postshot drilling.

References: (A) (B) (E) (F) (H) (AY) (DA)

PASSAIC			
Date:	04/06/62	Sponsor:	LRL
Time:	1000 PST	Depth of Burial:	766 ft
Location:	NTS U91	Purpose:	Weapons Related
Type:	Shaft	Yield:	Low
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: 6.0×10^2

^{133}Xe and ^{135}Xe in curies: 6.0×10^2

Release Summary: A drillback release occurred from a postshot drill hole on April 9, 1962, and lasted for approximately six hours.

References: (A) (C) (E) (F) (H) (I) (AY) (DA)

Test:	HUDSON		
Date:	04/12/62	Sponsor:	LRL
Time:	1000 PST	Depth of Burial:	480 ft
Location:	NTS U9n	Purpose:	Weapons Related
Type:	Shaft	Yield:	Low
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: 5.0×10^2

^{133}Xe and ^{135}Xe in curies: 5.0×10^2

Release Summary: A drillback release occurred from a postshot drill hole on April 16, 1962, and lasted for eight hours.

References: (A) (C) (E) (F) (H) (AY) (DA)

Test:	PLATTE		
Date:	04/14/62	Sponsor:	LRL
Time:	1000 PST	Depth of Burial:	560 ft
Location:	NTS U12k.01	Purpose:	Weapons Related
Type:	Tunnel	Yield:	1.85 kt
Release Detected:	Offsite	Type of Release:	Test and Test/Prompt Particle Sampling

Test Release at R+12 Hours, in Curies: 1.9×10^6

Isotopes Identified in the Release: ^{40}K , $^{95}\text{Zr}/^{95}\text{Nb}$, ^{103}Ru , ^{105}Ru , ^{131}I , ^{133}I , ^{135}I , ^{132}Te , $^{140}\text{Ba}/^{140}\text{La}$, ^{141}Ce , and ^{144}Ce

Cloud Direction: Northerly over Highway 25 (Nevada) at a bearing of approximately 20 degrees

Maximum Activity Detected in Air Offsite: 34,000 picocuries of gross beta activity per cubic meter of air at Queen City Summit, Nevada (unpopulated)

Maximum Gamma Exposure Rate Detected Offsite: 47 mR/h at Queen City Summit, Nevada

Maximum Iodine Level Detected Offsite: 3,500 picocuries of ^{131}I per cubic meter of air, 23,000 picocuries of ^{133}I per cubic meter of air, and 37,000 picocuries of ^{135}I per cubic meter of air at Queen City Summit, Nevada

Maximum Distance Radiation Detected Offsite: 0.10 mR/h at 28.1 miles northeast of Currant, Nevada

Release Summary: Venting occurred at the tunnel portal, through fissures, and at the sampling hole at H+1.5 seconds. The fissures were created on the side of the hill, and radial cracks formed on top of the hill. A persistent cloud was produced containing appreciable quantities of radioactivity associated with particles.

References: (A) (C) (E) (F) (G) (H) (AY) (DA) (GG)

Test:	DEAD		
Date:	04/21/62	Sponsor:	LRL
Time:	1040 PST	Depth of Burial:	634 ft
Location:	NTS U9k	Purpose:	Weapons Related
Type:	Shaft	Yield:	Low
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: 4.0×10^4

^{133}Xe and ^{135}Xe in curies: 4.0×10^4

Release Summary: A drillback release occurred from a postshot drill hole on April 23, 1962, and lasted for approximately 44 hours.

References: (A) (C) (E) (F) (G) (H) (AY) (DA)

Test:	BLACK		
Date:	04/27/62	Sponsor:	LRL
Time:	1000 PST	Depth of Burial:	714 ft
Location:	NTS U9p	Purpose:	Weapons Related
Type:	Shaft	Yield:	Low
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: 1.5×10^2

^{133}Xe and ^{135}Xe in curies: 1.5×10^2

Release Summary: A drillback release occurred from a postshot drill hole on April 30, 1962, and lasted for approximately two hours.

References: (A) (C) (E) (F) (H) (AY) (DA)

PACA			
Date:	05/07/62	Sponsor:	LASL
Time:	1233 PDT	Depth of Burial:	848 ft
Location:	NTS U3ax	Purpose:	Weapons Related
Type:	Shaft	Yield:	Low
Release Detected:	Onsite Only	Type of Release:	Test and Drillback

Test Release at R+12 Hours, in Curies: Less than 1.0×10^1

Drillback Release Activity at Time of Release, in Curies: $4.0 \times 10^5 - 1.0 \times 10^6$

Release Summary: A test release occurred from the surface ground zero area and lasted for less than two hours.

References: (A) (B) (E) (F) (H) (AY) (DA)

ARIKAREE			
Date:	05/10/62	Sponsor:	RLR
Time:	0800 PDT	Depth of Burial:	547 ft
Location:	NTS U9r	Purpose:	Weapons Related
Type:	Shaft	Yield:	Low
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: 2.0×10^3

^{133}Xe and ^{135}Xe in curies: 2.0×10^3

Release Summary: A drillback release occurred from the postshot drill hole on May 11, 1962, and lasted for five hours.

References: (C) (E) (H) (AY)

AARDVARK			
Date:	05/12/62	Sponsor:	LASL
Time:	1200 PDT	Depth of Burial:	1,424 ft
Location:	NTS U3amS	Purpose:	Weapons Related
Type:	Shaft	Yield:	40 kt
Release Detected:	Onsite Only	Type of Release:	Test and Drillback

Test Release at R+12 Hours, in Curies: Less than 1.0×10^1

Drillback Release Activity at Time of Release: Some

Release Summary: A test release from cables occurred at H+105 minutes and lasted for approximately 45 minutes.

Some radiation was detected in the area surrounding surface ground zero from gaseous radioactivity released during postshot drilling.

References: (A) (B) (E) (F) (H) (DA)

Test:	EEL		
Date:	05/19/62	Sponsor:	LRL
Time:	0800 PDT	Depth of Burial:	714 ft
Location:	NTS U9m	Purpose:	Weapons Related
Type:	Shaft	Yield:	4.5 kt
Release Detected:	Offsite	Type of Release:	Test/Prompt Particle Sampling

Test Release at R+12 Hours, in Curies: 1.9×10^6

Isotopes Identified in the Release: $^{95}\text{Zr}/^{95}\text{Nb}$, ^{103}Ru , ^{106}Ru , ^{105}Rh , ^{131}I , ^{133}I , ^{135}I , ^{132}Te , $^{140}\text{Ba}/^{140}\text{La}$, ^{141}Ce , and ^{144}Ce

Cloud Direction: Northerly towards Eureka, Nevada

Maximum Activity Detected in Air Offsite: 3,400 picocuries of gross beta activity per cubic meter of air at Currant, Nevada

Maximum Gamma Exposure Rate Detected Offsite: 10 mR/h at 5.9 miles northwest of Queen City Summit, Nevada (unpopulated)

Maximum Iodine Level Detected Offsite: 5.6 picocuries of ^{131}I per cubic meter of air, and 23 picocuries of ^{133}I per cubic meter of air at Currant, Nevada, and 26 picocuries of ^{135}I per cubic meter of air at Gunderson's Ranch, Nevada

Maximum Distance Radiation Detected Offsite: 0.02 mR/h at 19 miles west of Ely, Nevada, on Highway 50

Release Summary: Venting, in the form of a geyser, occurred at H+10 seconds from satellite hole U9m-2 and continued steadily until H+19 minutes, 42 seconds. A similar venting occurred at H+15 seconds from satellite hole U9m-3 and lasted until H+21 minutes. The venting ceased with crater subsidence.

References: (A) (C) (E) (F) (G) (H) (AY) (CC) (DA) (GH)

Test:	WHITE		
Date:	05/25/62	Sponsor:	LR
Time:	0800 PDT	Depth of Burial:	632 ft
Location:	NTS U9b	Purpose:	Weapons Related
Type:	Shaft	Yield:	Low
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: 1.6×10^3

^{133}Xe and ^{135}Xe in curies: 1.6×10^3

Release Summary: A drillback release occurred from the postshot drill hole on May 27, 1962, and lasted for eight hours.

References: (A) (C) (E) (F) (H) (AY) (DA)

Test:	PACKRAT		
Date:	06/06/62	Sponsor:	LASL
Time:	1000 PDT	Depth of Burial:	860 ft
Location:	NTS U3aw	Purpose:	Weapons Related
Type:	Shaft	Yield:	Low
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release: Some

Release Summary: Some radiation was detected in the area surrounding surface ground zero from gaseous radioactivity released during postshot drilling.

References: (A) (B) (E) (F) (H) (AY) (DA)

Test:	DES MOINES		
Date:	06/13/62	Sponsor:	LR
Time:	1400 PDT	Depth of Burial:	660 ft
Location:	NTS U12j.01	Purpose:	Weapons Related
Type:	Tunnel	Yield:	2.9 kt
Release Detected:	Offsite	Type of Release:	Test and Test/Prompt Particle Sampling

Test Release at R+12 Hours, in Curies: 1.1×10^7

Isotopes Identified in the Release: ^{103}Ru , ^{106}Ru / ^{106}Rh , ^{131}I , ^{133}I , ^{135}I , ^{132}Te , and ^{140}Ba / ^{140}La

Cloud Direction: Generally northeasterly over Queen City Summit, Nevada (unpopulated)

Maximum Activity Detected in Air Offsite: 15,000 picocuries of gross beta activity per cubic meter of air at Queen City Summit, Nevada, (unpopulated), and 5,900 picocuries of gross beta activity per cubic meter of air at Diablo, Nevada

Maximum Gamma Exposure Rate Detected Offsite: 160 mR/h at Queen City Summit, Nevada

Maximum Iodine Level Detected Offsite: 1,400 picocuries of ^{131}I per cubic meter of air, 16,000 picocuries of ^{133}I per cubic meter of air, and 230,000 picocuries of ^{135}I per cubic meter of air at Queen City Summit, Nevada

Maximum Distance Radiation Detected Offsite: 0.6 mR/h at 18.6 miles west of Ely, Nevada, on Highway 50 (approximately 163 miles from the detonation site)

Release Summary: Venting began at H+0.2 seconds on top of the hill at surface ground zero, then from the sampling hole on the face of the hill, and finally through the portal. The duration of the release was approximately five minutes. The test vented out of the tunnel mouth with sufficient pressure and flow rate that radioactive debris was projected entirely across the canyon and deposited on the slope behind a trailer shelter.

The test caused ^{131}I milk contamination in the following locations: Adavan, Nevada, 360 picocuries per liter on June 20; Elko, Nevada, 610 picocuries per liter on June 22; and Spokane, Washington, 1,200 picocuries per liter on June 20. All measurements were made from samples taken from fresh milk except those at Spokane that were made from pooled milk at a pasteurizing plant.

References: (A) (C) (E) (F) (G) (H) (M) (AY) (DA) (GI)

DAMAN I			
Date:	06/21/62	Sponsor:	LASL
Time:	1000 PDT	Depth of Burial:	854 ft
Location:	NTS U3be	Purpose:	Weapons Related
Type:	Shaft	Yield:	Low
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release: Some

Release Summary: Some radiation was detected in the area surrounding surface ground zero from gaseous radioactivity released during postshot drilling.

References: (A) (B) (E) (F) (H) (AY) (DA)

Test:	HAYMAKER		
Date:	06/27/62	Sponsor:	LASL
Time:	1100 PDT	Depth of Burial:	1,340 ft
Location:	NTS U3auS	Purpose:	Weapons Related
Type:	Shaft	Yield:	67 kt
Release Detected:	Onsite Only*	Type of Release:	Test and Drillback

Test Release at R+12 Hours, in Curies: Less than 1.5×10^2

Cloud Direction: Northerly

Maximum Activity Detected in Air Offsite: No fresh fission products were detected.

Maximum Gamma Exposure Rate Detected Offsite: No radiation intensities above background levels were measured.

Maximum Iodine Level Detected Offsite: No iodines were detected in air above background concentrations.

Maximum Distance Radiation Detected Offsite: No radiation intensities above background levels were measured.

Drillback Release Activity at Time of Release: Some

Release Summary: Small visible quantities of radioactive steam and/or gas were released. Some radiation was detected in the area surrounding surface ground zero from gaseous radioactivity released during postshot drilling.

Milk samples taken from Austin, Nevada, on June 30, 1962, showed a concentration of 180 picocuries of ^{131}I per liter. **

References: (A) (B) (E) (F) (H) (N) (AY) (DA) (EB) (GJ)

*As of April 19, 1979, this test was considered to be an onsite only release. See statement in explanatory information on "special designation for onsite releases."

**This iodine-131 concentration in milk may be attributed to Russian nuclear tests around the time of this test.

Test:	MARSHMALLOW		
Date:	06/28/62	Sponsor:	DoD/LRL
Time:	1000 PDT	Depth of Burial:	1,020 ft
Location:	NTS U16a	Purpose:	Weapons Effects
Type:	Tunnel	Yield:	Low
Release Detected:	Onsite Only	Type of Release:	Uncontrolled

Uncontrolled Release at R+12 Hours, in Curies: 3.5×10^4

Release Summary: An uncontrolled test release due to a stemming failure occurred at H+5 minutes and continued for several days. The estimated release at the time of release was approximately 1.0×10^6 curies.

References: (A) (E) (F) (H) (K) (L) (AY) (DA)

Test:	SACRAMENTO		
Date:	06/30/62	Sponsor:	LRL
Time:	1430 PDT	Depth of Burial:	500 ft
Location:	NTS U9v	Purpose:	Weapons Related
Type:	Shaft	Yield:	Low
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release: Slight

NOTE: See statement in explanatory information on "qualitative onsite release data."

References: (A) (C) (E) (F) (H) (AY) (DA)

Test:	SEDAN		
Date:	07/06/62	Sponsor:	LRL
Time:	1000 PDT	Depth of Burial:	635 ft
Location:	NTS U10h	Purpose:	Plowshare
Type:	Crater	Yield:	104 kt
Release Detected:	Offsite	Type of Release:	Test/Crater

Test Release at R+12 Hours, in Curies: 1.5×10^7

Isotopes Identified in the Release: ^7Be , ^{24}Na , ^{56}Mn , ^{103}Ru , ^{131}I , ^{132}I , ^{133}I , ^{135}I , ^{132}Te , $^{140}\text{Ba}/^{140}\text{La}$, ^{181}W , ^{187}W , ^{188}W , and tracers

Cloud Direction: Northeasterly

Maximum Activity Detected in Air Offsite: 13,000 picocuries of gross beta activity per cubic meter of air at Diablo, Nevada

Maximum Gamma Exposure Rate Detected Offsite: 324 mR/h at Diablo, Nevada, and 1,960 mR/h near Queen City Summit, Nevada (unpopulated)

Maximum Iodine Level Detected Offsite: 3,700 picocuries of ^{131}I per cubic meter of air, 13,000 picocuries of ^{133}I per cubic meter of air, and 60,000 picocuries of ^{135}I per cubic meter of air at Diablo, Nevada

Maximum Distance Radiation Detected Offsite: 0.7 mR/h near McGill, Nevada (north of Ely)

Release Summary: A persistent cloud containing appreciable quantities of radioactivity, including particulates, was produced during the cratering process. Fallout was documented to a distance of approximately 200 statute miles downwind.

The significant contributors to the gamma exposure rate at H+24 hours were fission products, ^{187}W , and ^{24}Na . Approximately 42% of the gamma exposure rate at H+24 hours was the result of fission products, 55% was from ^{187}W , 2% was from ^{24}Na , and less than 1% was from ^{181}W , ^{188}W , ^{7}Be , ^{56}Mn , and tracers.

References: (A) (C) (E) (F) (G) (H) (AR) (DD)

Test:	LITTLE FELLER II		
Date:	07/07/62	Sponsor:	DoD
Time:	1200 PDT	Depth of Burial:	3 ft above ground
Location:	NTS Area 18	Purpose:	Weapons Effects
Type:	Surface	Yield:	Low
Release Detected:	Onsite Only	Type of Release:	Test/Surface

Test Release: Atmospheric

References: (A) (E) (F) (AR)

Test:	JOHNNIE BOY		
Date:	07/11/62	Sponsor:	DoD
Time:	0945 PDT	Depth of Burial:	23 in
Location:	NTS Area 18	Purpose:	Weapons Effects
Type:	Crater	Yield:	500 tons
Release Detected:	Offsite	Type of Release:	Test/Crater

Test Release: Atmospheric

Isotopes Identified in the Release: ^{131}I , ^{133}I , ^{135}I , ^{132}Te , and $^{140}\text{Ba}/^{140}\text{La}$

Cloud Direction: Northerly; subsequently divided into two portions

Maximum Activity Detected in Air Offsite: 23,000 picocuries of gross beta activity per cubic meter of air at Twin Springs Ranch, Nevada

Maximum Gamma Exposure Rate Detected Offsite: 3.0 mR/h near the Rattlesnake Maintenance Station, Nevada, by ground monitoring; 3.8 mR/h on a recording radiation monitor at Twin Springs Ranch, Nevada

Maximum Iodine Level Detected Offsite: 500 picocuries of ^{131}I per cubic meter of air, 920 picocuries of ^{133}I , per cubic meter of air, and 2,300 picocuries of ^{135}I per cubic meter of air at Twin Springs, Nevada

Maximum Distance Radiation Detected Offsite: 3.0 mR/h at 11 miles northeast of Lockes, Nevada

Release Summary: A persistent cloud containing appreciable quantities of radioactivity, including particulates, was produced during the cratering process.

Detonation of this test resulted in the formation of a radioactive cloud that moved north from the test site. This cloud split into two portions. The lower portion traveled slightly west of north to the area of Highway 6 between Tonopah and Warm Springs, Nevada, then traveled east of north after assuming a width of 25-30 miles; the higher portion, above 11,000 ft mean sea level (MSL), traveled east of north.

References: (A) (E) (F) (AR) (GK)

Test:	MERRIMAC		
Date:	07/13/62	Sponsor:	LLNL
Time:	0900 PDT	Depth of Burial:	1,366 ft
Location:	NTS U3bd	Purpose:	Weapons Related
Type:	Shaft	Yield:	Intermediate
Release Detected:	Onsite Only	Type of Release:	Test and Drillback

Test Release at R+12 Hours, in Curies: Less than 1.0

Drillback Release Activity at Time of Release, in Curies: 2.2×10^4

^{133}Xe and ^{135}Xe in curies: 2.2×10^4

Release Summary: This test released small visible quantities of radioactive steam and/or gases.

A drillback release from the postshot drill hole occurred on July 13, 1962, and lasted for 35 hours.

References: (A) (C) (E) (F) (H) (I) (AR) (DB)

Test: SMALL BOY

Date:	07/14/62	Sponsor:	DoD
Time:	1130 PDT	Depth of Burial:	10 ft above ground
Location:	NTS Area 5	Purpose:	Weapons Effects
Type:	Tower	Yield:	Low
Release Detected:	Offsite	Type of Release:	Test/Surface

Test Release: Atmospheric

Isotopes Identified in the Release: $^{95}\text{Zr}/^{95}\text{Nb}$, ^{103}Ru , ^{131}I , ^{132}Te , and $^{140}\text{Ba}/^{140}\text{La}$

Cloud Direction: Northeasterly

Maximum Activity Detected in Air Offsite: 140,000 picocuries of gross beta activity per cubic meter of air at Elko, Nevada

Maximum Gamma Exposure Rate Detected Offsite: 14 mR/h at 13 miles south of Alamo, Nevada

Maximum Iodine Level Detected Offsite: 1,100 picocuries of ^{131}I per cubic meter of air at Caliente, Nevada, and 3,500 picocuries of ^{131}I per liter in milk at Caliente, Nevada

Maximum Distance Radiation Detected Offsite: 0.02 mR/h at seven miles south of Parowan, Utah, on Highway 143

Release Summary: This test resulted in the formation of a radioactive cloud that moved east from surface ground zero and crossed Highway 93 south of Alamo, Nevada. During the night of July 14 and the morning of July 15, the cloud moved further east into Utah, and it reached such low levels that it was detected only in small segments by ground monitoring.

References: (A) (E) (F) (AR) (GL)

Test: LITTLE FELLER I

Date:	07/17/62	Sponsor:	DoD
Time:	1000 PDT	Depth of Burial:	3 ft above ground
Location:	NTS Area 18	Purpose:	Weapons Effects
Type:	Surface	Yield:	Low
Release Detected:	Offsite	Type of Release:	Test

Test Release: Atmospheric

Isotopes Identified in the Release: $^{95}\text{Zr}/^{95}\text{Nb}$, ^{103}Ru , and ^{131}I

Cloud Direction: Northerly

Maximum Activity Detected in Air Offsite: 4,200 picocuries of gross beta activity per cubic meter of air at Twin Springs, Nevada

Maximum Gamma Exposure Rate Detected Offsite: 0.7 mR/h at Twin Springs Ranch, Nevada (exposure rate recorder measurement)

Maximum Iodine Level Detected Offsite: 1.3 picocuries of ^{131}I per cubic meter of air at Lockes, Nevada

Maximum Distance Radiation Detected Offsite: 0.1 mR/h at Lockes, Nevada (exposure rate recorder measurement)

References: (A) (E) (F) (AR) (GM)

Test:	WICHITA		
Date:	07/27/62	Sponsor:	LRL
Time:	1400 PDT	Depth of Burial:	493 ft
Location:	NTS U9y	Purpose:	Weapons Related
Type:	Shaft	Yield:	Low
Release Detected:	Onsite Only*	Type of Release:	Test

Test Release at R+12 Hours, in Curies: 7.6×10^2

Isotopes Identified in the Release: ^{131}I

Cloud Direction: Southerly

Maximum Activity Detected in Air Offsite: No fresh fission products were detected.

Maximum Gamma Exposure Rate Detected Offsite: No radiation intensities above background levels were detected.

Maximum Iodine Level Detected Offsite: Trace amounts of ^{131}I in the air at Lathrop Wells, Nevada**

Maximum Distance Radiation Detected Offsite: No radiation intensities above background levels were detected.

Release Summary: At H+26 seconds, gas vented from a fissure in the earth approximately 50 ft north of the emplacement hole and continued for five minutes.

References: (A) (C) (E) (F) (H) (N) (AR) (DB) (GN)

*As of April 19, 1979, this test was considered to be an onsite only release. See statement in explanatory information on "special designation for onsite releases."

**A review of other data collected following this test indicated that the trace of ^{131}I was not necessarily attributable to this test.

Test:	YORK		
Date:	08/24/62	Sponsor:	LRRL
Time:	0800 PDT	Depth of Burial:	743 ft
Location:	NTS U9z	Purpose:	Weapons Related
Type:	Shaft	Yield:	Low
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: 1.2×10^5

^{133}Xe and ^{135}Xe in curies: 1.2×10^5

Release Summary: A drillback release occurred from a postshot drill hole on August 25, 1962, and lasted for 30 hours.

References: (A) (C) (E) (F) (H) (AR) (DB)

Test:	BOBAC		
Date:	08/24/62	Sponsor:	LASL
Time:	1000 PDT	Depth of Burial:	680 ft
Location:	NTS U3bl	Purpose:	Weapons Related
Type:	Shaft	Yield:	Low
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release: Some

Release Summary: Some radiation was detected in the area surrounding surface ground zero from gaseous radioactivity released during postshot drilling.

References: (A) (B) (E) (F) (H) (AR) (DB)

Test:	RARITAN		
Date:	09/06/62	Sponsor:	LRRL
Time:	1000 PDT	Depth of Burial:	516 ft
Location:	NTS U9u	Purpose:	Weapons Related
Type:	Shaft	Yield:	Low
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: 1.2×10^3

^{133}Xe and ^{135}Xe in curies: 1.2×10^3

Release Summary: A drillback release occurred from the postshot hole casing on September 6, 1962, and lasted for eight hours.

References: (C) (E) (H) (AR)

Test:	HYRAX		
Date:	09/14/62	Sponsor:	LASL
Time:	1010 PDT	Depth of Burial:	709 ft
Location:	NTS U3bh	Purpose:	Weapons Related
Type:	Shaft	Yield:	Low
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release: Some

References: (A) (B) (E) (F) (H) (AR) (DB)

Test:	ALLEGHENY		
Date:	09/29/62	Sponsor:	LLNL
Time:	1000 PDT	Depth of Burial:	692 ft
Location:	NTS U9x	Purpose:	Weapons Related
Type:	Shaft	Yield:	Low
Release Detected:	Onsite Only	Type of Release:	Test and Drillback

Test Release at R+12 Hours, in Curies: 7.6×10^2

Drillback Release Activity at Time of Release, in Curies: 8.8×10^2

^{133}Xe and ^{135}Xe in curies: 8.8×10^2

Release Summary: This test released small visible quantities of radioactive steam and/or gases. The test release occurred from the surface ground zero area at H+1 second and lasted for 12 minutes.

A drillback release from a postshot drill hole occurred on September 30, 1962, and lasted for 15 hours.

References: (A) (C) (E) (H) (AR) (DB)

Test:	MISSISSIPPI		
Date:	10/05/62	Sponsor:	LR _L
Time:	1000 PDT	Depth of Burial:	1,620 ft
Location:	NTS U9ad	Purpose:	Weapons Related
Type:	Shaft	Yield:	115 kt
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: 4.9×10^3

^{133}Xe and ^{135}Xe in curies: 4.9×10^3

Release Summary: A drillback release occurred from a postshot drill hole on October 7, 1962, and lasted for 15 hours.

References: (A) (C) (E) (H) (AR) (DB)

Test:	ROANOKE		
Date:	10/12/62	Sponsor:	LR _L
Time:	0800 PDT	Depth of Burial:	577 ft
Location:	NTS U9q	Purpose:	Weapons Related
Type:	Shaft	Yield:	Low
Release Detected:	Onsite Only	Type of Release:	Test and Drillback

Test Release at R+12 Hours, in Curies: 1.9×10^2

Drillback Release Activity at Time of Release, in Curies: 1.0×10^3

^{133}Xe and ^{135}Xe in curies: 1.0×10^3

Release Summary: A minor gaseous release lasting 68 minutes occurred at H+7 minutes from the surface ground zero area through the emplacement hole casing and air dielectric signal and diagnostic cables. The greater part of the radiation was confined to the vicinity of surface ground zero. The venting was stopped by preparations for postshot drilling.

A drillback release from Postshot Hole No. 1 occurred at 0145 hours on October 14, 1962, and lasted for one hour.

References: (A) (C) (E) (H) (AR) (DB)

Test:	WOLVERINE		
Date:	10/12/62	Sponsor:	LASL
Time:	1000 PDT	Depth of Burial:	240 ft
Location:	NTS U3av	Purpose:	Weapons Related
Type:	Shaft	Yield:	Low
Release Detected:	Onsite Only	Type of Release:	Test

Test Release at R+12 Hours, in Curies: Less than 1.0×10^2

Release Summary: A test release at about H+1 minute occurred from surface ground zero and lasted for approximately 88 minutes. All readings had decayed to background levels by H+90 minutes.

References: (B) (E) (H) (AR)

Test:	BANDICOOT		
Date:	10/19/62	Sponsor:	LASL
Time:	1100 PDT	Depth of Burial:	800 ft
Location:	NTS U3bj	Purpose:	Weapons Related
Type:	Shaft	Yield:	12.5 kt
Release Detected:	Offsite	Type of Release:	Test

Test Release at R+12 Hours, in Curies: 3.0×10^6

Isotopes Identified in the Release: $^{95}\text{Zr}/^{95}\text{Nb}$, ^{103}Ru , ^{131}I , ^{133}I , ^{135}I , ^{132}Te , and $^{140}\text{Ba}/^{140}\text{La}$

Cloud Direction: Northerly for the lower part of the cloud; south southwesterly for the upper portion of the cloud

Maximum Activity Detected in Air Offsite: 52,000 picocuries of gross beta activity per cubic meter of air at Death Valley Junction, California

Maximum Gamma Exposure Rate Detected Offsite: Greater than 20 mR/h on Highway 95, seven miles west of the Mercury Junction (Nevada)*

Maximum Iodine Level Detected Offsite: 310 picocuries of ^{131}I per cubic meter of air, and 2,500 picocuries of ^{135}I per cubic meter of air at Lathrop Wells, Nevada; maximum ^{131}I level in milk, 160 picocuries per liter on October 23, 1962, at Springdale, Nevada

Maximum Distance Radiation Detected Offsite: 0.01 mR/h at 14.5 miles south of Shoshone, California

Release Summary: At H+5 seconds a persistent cloud was produced containing appreciable quantities of radioactivity associated with particulates. This test venting, that lasted for five minutes, was from a ground fault near the surface ground zero area.

The radioactive cloud split into two portions. The lower portion of the cloud traveled in a north-northeasterly direction to Area 9 where it remained stagnant, then moved slowly across Flat Top Mesa and north to the Area 12 Compound. The cloud dispersed in the valleys north of the Nevada Test Site. No exposures to people were detected.

The upper portion of the cloud traveled in a southerly direction and traversed a course over Camp Mercury, Cactus Springs, Indian Springs, Lathrop Wells and Highway 95 (Nevada). Upon crossing Highway 95, the cloud was nine miles wide, diffusing rapidly, and proceeding southwest, passing over the Los Angeles, California area.

References: (A) (C) (E) (G) (H) (AR) (DB) (GO)

*Upper limit of measuring instrument.

Test:	SANTEE		
Date:	10/27/62	Sponsor:	LLNL
Time:	0800 PDT	Depth of Burial:	1,048 ft
Location:	NTS U10f	Purpose:	Weapons Related
Type:	Shaft	Yield:	Low
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: 4.0×10^3

^{133}Xe and ^{135}Xe in curies: 4.0×10^3

Release Summary: A drillback release occurred from the area of the casing and drill hole on October 27, 1962, and lasted for 15 hours.

References: (A) (C) (E) (H) (AR) (DB)

Test:	ST. LAWRENCE		
Date:	11/09/62	Sponsor:	LLNL
Time:	1000 PST	Depth of Burial:	546 ft
Location:	NTS U2b	Purpose:	Weapons Related
Type:	Shaft	Yield:	Low
Release Detected:	Onsite Only	Type of Release:	Test and Drillback

Test Release at R+12 Hours, in Curies: 3.5

Drillback Release Activity at Time of Release, in Curies: 6.0×10^3

^{133}Xe and ^{135}Xe in curies: 6.0×10^3

Release Summary: A test release from the surface ground zero area occurred at H+21 minutes.

A drillback release from a postshot drill hole occurred on November 9, 1962, and lasted for 12 hours.

References: (C) (E) (H) (AR)

Test:	ANACOSTIA		
Date:	11/27/62	Sponsor:	LLNL
Time:	1000 PST	Depth of Burial:	747 ft
Location:	NTS U9i	Purpose:	Plowshare
Type:	Shaft	Yield:	Low
Release Detected:	Onsite Only	Type of Release:	Test/Prompt Particle Sampling and Drillback

Test Release at R+12 Hours, in Curies: 1.9×10^2

Drillback Release Activity at Time of Release, in Curies: 6.6×10^3

^{133}Xe and ^{135}Xe in curies: 6.6×10^3

Release Summary: A venting occurred at H+8 seconds from the sampling area and at H+35 seconds between the emplacement pipe and the prompt sampling pipe. The release lasted for 23.7 minutes.

The effluent gas gave a maximum reading of 95 mR/h on the ground one mile downwind from surface ground zero at H+0.5 hour. The most significant radiation was confined to the crater and radiochemistry sampling area.

A drillback release from a postshot drill hole occurred on November 28, 1962, and lasted for seven hours.

References: (A) (C) (E) (H) (AR) (DB)

Test:	TAUNTON		
Date:	12/04/62	Sponsor:	LLNL
Time:	0800 PST	Depth of Burial:	748 ft
Location:	NTS U9aa	Purpose:	Weapons Related
Type:	Shaft	Yield:	Low
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: 4.0×10^3

^{133}Xe and ^{135}Xe in curies: 4.0×10^3

Release Summary: A drillback release occurred from the ventilation line and casing on December 4, 1962, and lasted for eight hours.

References: (C) (E) (H) (AR)

Test:	MADISON		
Date:	12/12/62	Sponsor:	LRL
Time:	0925 PST	Depth of Burial:	1,318 ft
Location:	NTS U12g.01	Purpose:	Weapons Related
Type:	Tunnel	Yield:	Low
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: 2.0×10^4

^{133}Xe and ^{135}Xe in curies: 2.0×10^4

Release Summary: A drillback release occurred from a postshot drill hole on December 13, 1962, and lasted for 30 hours.

References: (A) (C) (E) (H) (AR) (DB)

Test:	NUMBAT		
Date:	12/12/62	Sponsor:	LASL
Time:	1045 PST	Depth of Burial:	761 ft
Location:	NTS U3bu	Purpose:	Weapons Related
Type:	Shaft	Yield:	Low
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release: Some

Release Summary: Some radiation was detected in the area surrounding surface ground zero from gaseous radioactivity released during postshot drilling.

References: (A) (B) (E) (H) (AR) (DB)

Test:	MANATEE		
Date:	12/14/62	Sponsor:	LR _L
Time:	1000 PST	Depth of Burial:	192 ft
Location:	NTS U9af	Purpose:	Weapons Related
Type:	Shaft	Yield:	Low
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: 1.8×10^3

^{133}Xe and ^{135}Xe in curies: 1.8×10^3

Release Summary: A drillback release occurred from the postshot drill hole on December 14, 1962, and lasted for approximately five hours.

References: (C) (E) (H) (AR) (DB)

Test:	CASSELMAN		
Date:	02/08/63	Sponsor:	LR _L
Time:	0800 PST	Depth of Burial:	994 ft
Location:	NTS U10g	Purpose:	Weapons Related
Type:	Shaft	Yield:	Low
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: 6.3×10^3

^{133}Xe and ^{135}Xe in curies: 6.3×10^3

Release Summary: A drillback release occurred from the ventilation line on February 9, 1963, and lasted for ten hours.

References: (C) (E) (H) (AR) (DB)

Test:	CARMEL		
Date:	02/21/63	Sponsor:	LR _L
Time:	1147 PST	Depth of Burial:	536 ft
Location:	NTS U2h	Purpose:	Weapons Related
Type:	Shaft	Yield:	Low
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: 7.2×10^3

^{133}Xe and ^{135}Xe in curies: 7.2×10^3

Release Summary: A drillback release occurred from a postshot drill hole on February 21, 1963, and lasted for two hours.

References: (C) (E) (H) (AR) (DB)

Test: KAWeah

Date:	02/21/63	Sponsor:	LRL
Time:	1147 PST	Depth of Burial:	745 ft
Location:	NTS U9ab	Purpose:	Plowshare
Type:	Shaft	Yield:	Low
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: 4.0×10^4

^{133}Xe and ^{135}Xe in curies: 4.0×10^4

Release Summary: A drillback release occurred from the postshot drill hole on February 22, 1963, and lasted for 22 hours.

References: (C) (E) (H) (AR) (DB)

Test: TOyah

Date:	03/15/63	Sponsor:	LRL
Time:	0822 PST	Depth of Burial:	429 ft
Location:	NTS U9ac	Purpose:	Weapons Related
Type:	Shaft	Yield:	Low
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: 1.2×10^3

^{133}Xe and ^{135}Xe in curies: 1.2×10^3

Release Summary: A drillback release occurred from a postshot drill hole on March 15, 1963, and lasted for five hours.

References: (C) (E) (H) (AR) (JA)

Test:	CUMBERLAND		
Date:	04/11/63	Sponsor:	LR _L
Time:	0803 PST	Depth of Burial:	745 ft
Location:	NTS U2e	Purpose:	Weapons Related
Type:	Shaft	Yield:	Low
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: 8.5×10^3

^{133}Xe and ^{135}Xe in curies: 8.5×10^3

Release Summary: A drillback release occurred from a postshot drill hole on April 12, 1963, and lasted for seven hours.

References: (C) (E) (H) (AR) (JB)

Test:	KOOTANAI*		
Date:	04/24/63	Sponsor:	LR _L
Time:	0809 PST	Depth of Burial:	597 ft
Location:	NTS U9w	Purpose:	Weapons Related
Type:	Shaft	Yield:	Low
Release Detected:	Onsite Only	Type of Release:	Test and Drillback

Test Release at R+12 Hours, in Curies: 8.2

Isotopes Identified in the Release: ^{135}Xe , ^{138}Xe , and ^{138}Cs

Drillback Release Activity at Time of Release, in Curies: 4.0×10^2

xenons and iodines in curies: 4.0×10^2

Release Summary: A test release occurred from the surface ground zero cables at H+13 minutes and lasted for two minutes.

A drillback release from a postshot drill hole occurred on April 25, 1963, and lasted for four hours.

References: (C) (E) (H) (Q) (AR) (JC)

*While DOE/NV-209 (Rev. 14) lists both KOOTANAI and PAISANO as releasing effluent, reference data indicate that the release was probably attributed to KOOTANAI.

Test:	DOUBLE TRACKS		
Date:	05/15/63	Sponsor:	Joint US-UK
Time:	0255 PDT	Depth of Burial:	Not Applicable
Location:	NAFR	Purpose:	Storage-Transportation
Type:	Surface	Yield:	Zero
Release Detected:	Offsite	Type of Release:	Test/Plutonium Dispersal

Test Release at R+12 Hours, in Curies: Unknown

Maximum Activity Detected in Air Offsite: Estimated 12.1 disintegrations per minute per cubic meter (alpha) at Scotty's Junction, Nevada

Maximum Gamma Exposure Rate Detected Offsite: No offsite gamma radiation was detected.

Maximum Iodine Level Detected Offsite: Non-nuclear experiment, no iodine was produced.

Maximum Distance Radiation Detected Offsite: Alpha activity detected on air samplers at Beatty, Nevada and Scotty's Junction, Nevada

Release Summary: This test was part of Operation Roller Coaster. Four storage and transportation tests on the NAFR were conducted as Operation Roller Coaster during May and June 1963.

DOUBLE TRACKS was a non-nuclear experiment that took place on Stonewall Flats at 0255 hours on May 15, 1963. The purpose of this test was to determine data on debris scattering. To accomplish this purpose, conventional high explosives were used to scatter an alpha-emitting isotope into the atmosphere.

Filters from air samplers taken at populated locations indicated a maximum concentration of 12.1 disintegrations per minute/cubic meter at Scotty's Junction, Nevada. (The air sample with this highest reading was from an air sampler with a burned out motor, and the total air flow had to be estimated.) A filter from a sampler run from 1245 hours May 14 to 1300 hours on May 15 in Beatty, Nevada, showed 11.3 disintegrations per minute per cubic meter. Other filters from populated locations showed concentrations above the 0.04 disintegrations per minute per cubic meter background level.

References: (E) (AZ) (DE) (GP)

Test:	STONES		
Date:	05/22/63	Sponsor:	LLNL
Time:	0840 PDT	Depth of Burial:	1,295 ft
Location:	NTS U9ae	Purpose:	Weapons Related
Type:	Shaft	Yield:	Intermediate
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: 5.8×10^3

Isotopes Identified in the Release: ^{124}Sb , ^{131}I , ^{133}I , ^{135}I , ^{133}Xe , ^{135}Xe , and $^{140}\text{Ba}/^{140}\text{La}$

Release Summary: A drillback release occurred from a postshot drill hole on May 23, 1963, and lasted ten hours.

References: (C) (E) (H) (AR) (DB) (JD) (JE)

Test:	CLEAN SLATE I		
Date:	05/25/63	Sponsor:	Joint US-UK
Time:	0417 PDT	Depth of Burial:	Not Applicable
Location:	NAFR	Purpose:	Storage-Transportation
Type:	Surface	Yield:	Zero
Release Detected:	Offsite	Type of Release:	Test/Plutonium Dispersal

Test Release at R+12 Hours, in Curies: Unknown

Maximum Activity Detected in Air Offsite: 0.32 disintegrations per minute per cubic meter (alpha) at Lathrop Wells, Nevada

Maximum Gamma Exposure Rate Detected Offsite: No offsite gamma radiation was detected.

Maximum Iodine Level Detected Offsite: Non-nuclear experiment, no iodine was produced.

Release Summary: The test was part of Operation Roller Coaster. Four storage and transportation tests on the NAFR were conducted as Operation Roller Coaster during May and June 1963.

At 0417 hours on May 25, 1963, CLEAN SLATE I, a conventional high explosive device with a plutonium-239 component, was detonated at Cactus Flats, Nevada. The purpose of this experiment was to determine data on the extent and concentration of alpha-emitting debris scattering from a conventional high-explosive device equipped with one or more alpha-emitting components.

Due to fluctuating wind patterns, air filters from populated areas northeast and southeast of surface ground zero showed small concentrations of alpha-emitting material with a maximum

activity of 0.32 disintegrations per minute per cubic meter of air at Lathrop Wells, Nevada. Filters from populated areas (including Hiko, Lund, Mesquite, Pioche, Tonopah, Warm Springs, Las Vegas, Furnace Creek, and Lathrop Wells) showed small concentrations of contaminated material.

References: (E) (AZ) (DE) (GQ)

Test:	PLEASANT		
Date:	05/29/63	Sponsor:	LRL
Time:	0803 PDT	Depth of Burial:	690 ft
Location:	NTS U9ah	Purpose:	Weapons Related
Type:	Shaft	Yield:	Low
Release Detected:	Onsite Only	Type of Release:	Test and Drillback

Test Release at R+12 Hours, in Curies: 7.6×10^2

Isotopes Identified in the Release: ^{135}Xe and ^{138}Cs

Drillback Release Activity at Time of Release, in Curies: 2.0×10^4

Isotopes Identified In the Release: ^{131}I , ^{133}I , ^{135}I , ^{133}Xe , and ^{135}Xe

Release Summary: A test release occurred from surface ground zero cables at H+15 minutes and lasted for 2.5 hours.

A drillback release occurred from a postshot drill hole on May 29, 1963, and lasted for 24 hours.

References: (C) (E) (H) (AR) (JF) (JG)

Test:	CLEAN SLATE II		
Date:	05/31/63	Sponsor:	Joint US-UK
Time:	0347 PDT	Depth of Burial:	Not Applicable
Location:	NAFR	Purpose:	Storage-Transportation
Type:	Surface	Yield:	Zero
Release Detected:	Onsite Only	Type of Release:	Test/Plutonium Dispersal

Test Release at R+12 Hours, in Curies: Unknown

Release Summary: This test was part of Operation Roller Coaster. Four storage and transportation tests on the NAFR were conducted as Operation Roller Coaster during May and June 1963.

CLEAN SLATE II, the third non-nuclear experiment of Operation Roller Coaster, was carried out on Cactus Flats, Nevada, at 0347 hours, May 31, 1963. The purpose of this detonation was to determine data on the extent and concentration of debris scattering from a conventional high-explosive device equipped with one or more alpha-emitting isotope components.

Air filter results from 31 permanent stations surrounding the test area indicated that any material released from CLEAN SLATE II was confined to the Cactus Flats location.

References: (E) (AZ) (DE) (GR)

Test:	YUBA		
Date:	06/05/63	Sponsor:	LLNL
Time:	1000 PDT	Depth of Burial:	795 ft
Location:	NTS U12b.10	Purpose:	Weapons Related
Type:	Tunnel	Yield:	3.1 kt
Release Detected:	Offsite (Drillback Only)	Type of Release:	Test/Prompt Particle Sampling and Drillback

Test Release at R+12 Hours, in Curies: 1.1×10^2

Isotopes Identified in the Release: ^{88}Kr , ^{131}I , ^{133}I , ^{135}I , ^{135}Xe , and ^{138}Cs

Drillback Release Activity at Time of Release, in Curies: 7.2×10^4

Isotopes Identified in the Release: ^{131}I , ^{133}I , ^{135}I , ^{133}Xe , and ^{135}Xe

Maximum Activity Detected in Air Offsite: No fresh fission products were detected.

Maximum Gamma Exposure Rate Detected Offsite: No radiation intensities above background levels were measured.

Maximum Iodine Level Detected Offsite: No iodine was detected.

Maximum Distance Radiation Detected Offsite: Two miles offsite at Lathrop Wells, Nevada (detected from the drillback release)

Release Summary: A test release occurred from the Rad-chem pipe.

A drillback release from a postshot drill hole occurred on June 7, 1963, and lasted for 100 hours.

References: (C) (E) (G) (H) (AR) (DB) (GS)

Test:	APSHAPA		
Date:	06/06/63	Sponsor:	LR
Time:	0958 PDT	Depth of Burial:	295 ft
Location:	NTS U9ai	Purpose:	Weapons Related
Type:	Shaft	Yield:	Low
Release Detected:	Onsite Only	Type of Release:	Test and Drillback

Test Release at R+12 Hours, in Curies: 3.8

Drillback Release Activity at Time of Release, in Curies: 3.0×10^2

^{133}Xe and ^{135}Xe in curies: 3.0×10^2

Release Summary: A test release from the surface ground zero area occurred at H+10 minutes and lasted for 25 minutes.

A drillback release from a postshot drill hole occurred on June 6, 1963, and lasted for four hours.

References: (C) (E) (H) (AR) (JH)

Test:	CLEAN SLATE III		
Date:	06/09/63	Sponsor:	Joint US-UK
Time:	0330 PDT	Depth of Burial:	Not Applicable
Location:	NAFR	Purpose:	Storage-Transportation
Type:	Surface	Yield:	Zero
Release Detected:	Offsite	Type of Release:	Test/Plutonium Dispersal

Test Release at R+12 Hours, in Curies: Unknown

Maximum Activity Detected in Air Offsite: Not above background; a maximum of 1.64×10^{-13} microcuries per cubic centimeter was measured on the Test Range Complex.

Maximum Gamma Exposure Rate Detected Offsite: No offsite gamma radiation was detected.

Maximum Iodine Level Detected Offsite: Non-nuclear experiment, no iodine was produced.

Maximum Distance Radiation Detected Offsite: 47.8 ± 1.5 disintegrations per minute per square foot of $^{239},^{240}\text{Pu}$ on a film collector at Springdale, Utah

Release Summary: This test was part of Operation Roller Coaster. Four storage and transportation tests on the NAFR were conducted as Operation Roller Coaster during May and June 1963.

At 0330 hours on June 9, 1963, the CLEAN SLATE III test was conducted at Cactus Flats, Nevada. The purpose of this test was to determine data on the extent and concentration of alpha-emitting debris scattering from a conventional high-explosive device with one or more radioactive components. This was the fourth and last test of the Roller Coaster series.

Careful ground monitoring to the southeast and southwest of surface ground zero failed to show any readings above background levels. The area was monitored after heavy morning and afternoon rains on June 9, 1963.

References: (E) (AZ) (DE) (GT)

Test:	KENNEBEC		
Date:	06/25/63	Sponsor:	LRL
Time:	1600 PDT	Depth of Burial:	742 ft
Location:	NTS U2af	Purpose:	Weapons Related
Type:	Shaft	Yield:	Low
Release Detected:	Onsite Only	Type of Release:	Test/Prompt Particle Sampling and Drillback

Test Release at R+12 Hours, in Curies: Less than 1.0

Drillback Release Activity at Time of Release, in Curies: 3.0×10^1

Isotopes Identified in the Release: ^{131}I , ^{133}I , ^{135}I , ^{133}Xe and ^{135}Xe

Release Summary: A test release from the Rad-chem line occurred at H+10 seconds and lasted for one minute.

A drillback release from the postshot drill hole occurred on June 26, 1963, at 1415 hours and lasted for 1.7 hours.

References: (C) (E) (H) (AR) (DB) (JI)

Test:	PEKAN		
Date:	08/12/63	Sponsor:	LASL
Time:	1645 PDT	Depth of Burial:	991 ft
Location:	NTS U3bw	Purpose:	Weapons Related
Type:	Shaft	Yield:	Low
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: 1.1×10^6

^{133}Xe in curies:	1.6×10^4
^{135}Xe in curies:	1.1×10^6
^{131}I in curies:	1.0×10^1
^{133}I in curies:	2.9×10^2
^{135}I in curies:	6.5×10^2
^{85}Kr in curies:	2.0×10^{-1}

References: (B) (E) (H) (AS) (JK)

Detonation:	KOHOCOTON (simultaneous with NATCHES, separate holes)		
Date:	08/23/63	Sponsor:	LLNL
Time:	0620 PDT	Depth of Burial:	835 ft
Location:	NTS U9ak	Purpose:	Weapons Related
Type:	Shaft	Yield:	Low
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: 3.0×10^3

^{133}Xe , ^{135}Xe , ^{131}I , ^{133}I , and ^{135}I in curies:	3.0×10^3
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Release Summary: A drillback release occurred from a postshot drill hole and ground zero cables on August 23, 1963, and lasted for 15 hours.

References: (C) (E) (H) (AS) (JL)

Test:	AHTANUM		
Date:	09/13/63	Sponsor:	LLNL
Time:	0653 PDT	Depth of Burial:	740 ft
Location:	NTS U21	Purpose:	Weapons Related
Type:	Shaft	Yield:	Low
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: 3.5×10^1

^{133}Xe and ^{135}Xe in curies:	3.5×10^1
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Release Summary: A drillback release occurred from the postshot drill hole on September 21, 1963, and lasted for four hours.

References: (C) (E) (H) (AS)

Test:	BILBY		
Date:	09/13/63	Sponsor:	LASL
Time:	1000 PDT	Depth of Burial:	2,343 ft
Location:	NTS U3cn	Purpose:	Weapons Related
Type:	Shaft	Yield:	249 kt
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: 1.0

^{133}Xe in curies: 1.0

^{131}I : trace

References: (B) (E) (H) (J) (AS)

Test:	CARP		
Date:	09/27/63	Sponsor:	LASL
Time:	0720 PDT	Depth of Burial:	1,081 ft
Location:	NTS U3cb	Purpose:	Weapons Related
Type:	Shaft	Yield:	Low
Release Detected:	Onsite Only	Type of Release:	Test and Drillback

Test Release Activity at R+12 hours, in Curies: 5.7×10^2

Isotopes Identified in the Release: ^{131}I , ^{133}I , and ^{135}I

Drillback Release Activity at Time of Release, in Curies: 5.5×10^2

^{133}Xe in curies: 5.5×10^2

^{135}Xe in curies: 5.5×10^{-1}

^{131}I in curies: 6.8×10^{-2}

^{133}I in curies: 1.1

^{88}Rb : trace

References: (B) (E) (H) (AS)

Test:	NARRAGUAGUS		
Date:	09/27/63	Sponsor:	LRRL
Time:	1030 PDT	Depth of Burial:	493 ft
Location:	NTS U2f	Purpose:	Weapons Related
Type:	Shaft	Yield:	Low
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: 1.6×10^2

Release Summary: Radioactivity was released during drillback operations, beginning at 0830 hours on September 29, 1963, and lasting for 13 hours.

References: (C) (E) (H) (AS) (UQ)

Test:	GRUNION		
Date:	10/11/63	Sponsor:	LASL
Time:	0700 PDT	Depth of Burial:	856 ft
Location:	NTS U3bz	Purpose:	Weapons Related
Type:	Shaft	Yield:	Low
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: approximately 4.0×10^3

^{133}Xe in curies: 4.0×10^3 (approximate)

^{131}I in curies: 4.3×10^{-2}

^{133}I in curies: 9.9×10^{-2}

References: (B) (E) (H) (J) (AS)

Test:	TORNILLO		
Date:	10/11/63	Sponsor:	LRRL
Time:	1400 PDT	Depth of Burial:	489 ft
Location:	NTS U9aq	Purpose:	Plowshare
Type:	Shaft	Yield:	Low
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: 5.2×10^2

^{133}Xe and ^{135}Xe in curies: 5.2×10^2

Release Summary: A drillback release occurred from the postshot drill hole on October 12, 1963, and lasted for 12 hours.

References: (C) (E) (H) (AS) (JM)

Test: CLEARWATER

Date:	10/16/63	Sponsor:	LRL
Time:	1000 PDT	Depth of Burial:	1,798 ft
Location:	NTS U12q	Purpose:	Weapons Related
Type:	Shaft	Yield:	Intermediate
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: 4.6×10^3

^{133}Xe in curies: 4.6×10^3

^{131}I in curies: 2.3×10^{-2}

Release Summary: A drillback release occurred from the postshot drill hole on October 23, 1963, beginning at 1600 hours and lasting for seven hours.

References: (C) (E) (H) (AS) (TY)

Test: SHOAL

Date:	10/26/63	Sponsor:	LASL/ARPA
Time:	1000 PDT	Depth of Burial:	1,204 ft
Location:	Fallon, Nevada*	Purpose:	Vela Uniform
Type:	Shaft	Yield:	12 kt
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: 1.1×10^2

^{131}mXe and ^{133}Xe in curies: 1.1×10^2

^{131}I in curies: less than 1.0

References: (E) (H) (L) (DU) (JN)

*28 miles southeast of Fallon, Nevada

Test:	ANCHOVY		
Date:	11/14/63	Sponsor:	LASL
Time:	0800 PST	Depth of Burial:	853 ft
Location:	NTS U3bq	Purpose:	Weapons Related
Type:	Shaft	Yield:	Low
Release Detected:	Onsite Only	Type of Release:	Test and Drillback

Test Release at R+12 Hours: Slight

Isotopes Identified in the Release: ^{78}As and ^{138}Xe

Drillback Release Activity at Time of Release, in Curies: $1.3 \times 10^5 - 2.3 \times 10^5$

^{133}Xe in curies:	2.1×10^4
^{135}Xe in curies:	1.1×10^5
^{131}I in curies:	2.5
^{133}I in curies:	1.1×10^1
^{135}I in curies:	3.5×10^2
^{88}Kr in curies:	$1.0 \times 10^4 - 1.0 \times 10^5$

Release Summary: There was a small test release, but only qualitative data were available.

Drillback releases occurred on November 15 and December 3, 1963.

References: (B) (E) (H) (AS) (JO)

Test:	MUSTANG		
Date:	11/15/63	Sponsor:	LRL
Time:	0700 PST	Depth of Burial:	544 ft
Location:	NTS U9at	Purpose:	Weapons Related
Type:	Shaft	Yield:	Low
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: $1.0 \times 10^2*$

^{133}Xe , ^{133m}Xe , and ^{135}Xe in curies:	1.0×10^2
^{131}I , ^{133}I , and ^{135}I :	trace

Release Summary: Drillback releases occurred on November 16, 1963, beginning at 1200 hours, from the surface ground zero casing, lasting for 35 hours, and from the ventilation system lasting for 26 hours.

References: (C) (E) (H) (X) (AS) (JP)

*An analysis of RAMS data indicated that approximately 2.8×10^3 curies of ^{133}Xe and ^{135}Xe could have been released through the ventilation system during the postshot drilling period without being detected.

Test:	GREYS		
Date:	11/22/63	Sponsor:	LRL
Time:	0930 PST	Depth of Burial:	987 ft
Location:	NTS U9ax	Purpose:	Weapons Related
Type:	Shaft	Yield:	Intermediate
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: Less than 4.6×10^2

^{131}I , ^{133}I , ^{135}I , ^{133}Xe , $^{133\text{m}}\text{Xe}$, and ^{135}Xe in curies: less than 4.6×10^2

Release Summary: Drillback releases occurred from the drilling rig at 2130 hours on November 23, 1963, lasting for 19 hours, and from the ventilation system on the same day, lasting for 18 hours.

References: (C) (E) (H) (AS) (UT)

Detonation:	BARRACUDA* (simultaneous with SARDINE, separate holes)		
Date:	12/04/63	Sponsor:	LASL
Time:	0838 PST	Depth of Burial:	864 ft
Location:	NTS U3cr	Purpose:	Weapons Related
Type:	Shaft	Yield:	Low
Release Detected:	Onsite Only	Type of Release:	Test and Drillback

Test Release at R+12 Hours, in Curies: 9.5×10^{-3}

Isotopes Identified in the Release: xenons and iodines

Drillback Release Activity at Time of Release, in Curies: 1.0×10^2

^{133}Xe in curies: 1.0×10^2

iodines in curies: less than 4.0×10^{-2}

Release Summary: A test release occurred at H+12 minutes from surface ground zero and lasted for 72 hours.

References: (B) (E) (H) (AS)

Detonation: SARDINE* (simultaneous with BARRACUDA, separate holes)

Date:	12/04/63	Sponsor:	LASL
Time:	0838 PST	Depth of Burial:	860 ft
Location:	NTS U3ch	Purpose:	Weapons Related
Type:	Shaft	Yield:	Low
Release Detected:	Onsite Only	Type of Release:	Test and Drillback

Test Release at R+12 Hours, in Curies: 3.0×10^1

Isotopes Identified in the Release: ^{131}I , ^{133}I , ^{135}I , and ^{133}Xe

Drillback Release Activity at Time of Release, in Curies: Less than or equal to 9.0×10^{-2}

iodines in curies: less than or equal to 9.0×10^{-2}

Release Summary: A test release from the surface ground zero area occurred at H+12 minutes and lasted for 100 minutes.

References: (B) (E) (H) (AS)

*BARRACUDA and SARDINE are one test because these detonations occurred within the time frame and proximity as defined in the Threshold Test Ban Treaty. They are listed separately because of individual test data.

Test: EAGLE

Date:	12/12/63	Sponsor:	LLNL
Time:	0802 PST	Depth of Burial:	540 ft
Location:	NTS U9av	Purpose:	Weapons Related
Type:	Shaft	Yield:	5.3 kt
Release Detected:	Offsite	Type of Release:	Test and Drillback

Test Release at R+12 Hours, in Curies: 7.6×10^2

Isotopes Identified in the Release: ^{89}Sr , ^{91}Sr , ^{92}Sr , ^{99}Mo , ^{103}Ru , ^{132}I , ^{133}I , ^{134}I , ^{135}I , ^{132}Te , ^{135}Xe , ^{138}Cs , and $^{140}\text{Ba}/^{140}\text{La}$

Cloud Direction: Southwesterly over Death Valley and Central Southern California, about 140 miles beyond the point of release

Maximum Activity Detected in Air Offsite: 24 picocuries of gross beta activity per cubic meter of air at Death Valley Junction, California

Maximum Gamma Exposure Rate Detected Offsite: No readings above background levels were recorded.

Maximum Iodine Level Detected Offsite: 10 picocuries of ^{135}I per cubic meter of air, and 35 picocuries of ^{133}I per cubic meter of air at Death Valley Junction, California.

Maximum Distance Radiation Detected Offsite: Isotopic activity was detected in air samples only as far as Death Valley Junction, California.

Drillback Release Activity at Time of Release, in Curies: Less than 2.0×10^2

^{133}Xe and ^{135}Xe in curies: less than 2.0×10^2

^{131}I , ^{133}I , and ^{135}I in curies: less than 1.0×10^{-1}

Release Summary: Venting occurred from the line-of-site (LOS) pipe at H+30 seconds and lasted for three minutes.

A drillback release occurred from the ventilation system at 1300 hours on December 15, 1963, and lasted for 83 hours.

References: (C) (D) (E) (G) (H) (Z) (AS) (GU) (JQ)

Test:	TUNA		
Date:	12/20/63	Sponsor:	LASL
Time:	0724 PST	Depth of Burial:	1,359 ft
Location:	NTS U3de	Purpose:	Weapons Related
Type:	Shaft	Yield:	Low
Release Detected:	Onsite Only	Type of Release:	Test

Test Release Activity at R+12 Hours, in Curies: Less than 1.2×10^{-1}

Isotopes Identified in the Release: ^{131}I , ^{133}Xe , and ^{135}Xe

References: (B) (E) (H) (AS)

Test:	FORE		
Date:	01/16/64	Sponsor:	LRL
Time:	0800 PST	Depth of Burial:	1,609 ft
Location:	NTS U9ao	Purpose:	Weapons Related
Type:	Shaft	Yield:	20 to 200 kt
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: 1.2×10^3

^{133}Xe in curies: 8.9×10^2

^{135}Xe in curies: 2.9×10^2

Release Summary: A drillback release occurred from the ventilation system at 1455 hours on January 18, 1964, and lasted for 28.5 hours.

References: (C) (E) (H) (AS) (JR)

Test:	OCONTO		
Date:	01/23/64	Sponsor:	LLNL
Time:	0800 PST	Depth of Burial:	868 ft
Location:	NTS U9ay	Purpose:	Weapons Related
Type:	Shaft	Yield:	10.5 kt
Release Detected:	Offsite	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: 3.0×10^4

^{133}Xe in curies: 9.9×10^3

^{135}Xe in curies: 2.1×10^4

^{131}I in curies: 1.0×10^{-3}

^{133}I in curies: 5.0×10^{-4}

Cloud Direction: Northerly

Maximum Activity Detected in Air Offsite: No gross beta activities were above normal levels.

Maximum Gamma Exposure Rate Detected Offsite: No readings were above background levels. (Detected by aerial monitoring only).

Maximum Iodine Level Detected Offsite: No iodine was detected.

Maximum Distance Radiation Detected Offsite: Radioactivity from redrilling was detected by aerial monitoring to Hancock Summit, Nevada.

Release Summary: A drillback release occurred from the ventilation system at 2200 hours on January 24, 1964, and lasted for 26 hours. Radioactivity was detected offsite by aerial monitoring only.

References: (C) (E) (H) (AS) (GV) (JS)

Test:	CLUB		
Date:	01/30/64	Sponsor:	LRL
Time:	0800 PST	Depth of Burial:	590 ft
Location:	NTS U2aa	Purpose:	Weapons Related
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Test and Drillback

Test Release Activity at R+12 Hours, in Curies: 1.2

Drillback Release Activity at Time of Release, in Curies: 5.9×10^2

^{133}Xe in curies: 4.8×10^2

^{135}Xe in curies: 1.1×10^2

^{131}I : trace

^{133}I : trace

Release Summary: An test release occurred from the cables at 1025 hours and lasted for two hours.

A drillback release occurred from the ventilation system at 0700 hours on February 1, 1964, and lasted for 10 hours.

References: (C) (E) (H) (AS) (U7)

Test:	SOLENDON		
Date:	02/12/64	Sponsor:	LASL
Time:	0738 PST	Depth of Burial:	493 ft
Location:	NTS U3cz	Purpose:	Weapons Related
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Test

Test Release Activity at R+12 Hours, in Curies: 9.6

Isotopes Identified in the Release: ^{131}I , ^{133}I , ^{135}I , ^{133}Xe , ^{135}Xe , and ^{138}Xe

Release Summary: A test release occurred at H+10 minutes from the surface ground zero area and lasted for 7.5 hours.

References: (B) (E) (H) (AS) (UN)

Test:	BUNKER		
Date:	02/13/64	Sponsor:	LRRL
Time:	0730 PST	Depth of Burial:	745 ft
Location:	NTS U9bb	Purpose:	Weapons Related
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Test and Drillback

Test Release Activity At R+12, in Curies: 1.4

Drillback Release Activity at Time of Release, in Curies: Less than 4.2×10^2

^{133}Xe in curies: less than 2.2×10^2

^{135}Xe in curies: less than 2.0×10^2

Release Summary: A test release occurred from the surface ground zero area at H+4 minutes and lasted for 20 minutes.

A drillback release occurred from the ventilation system beginning at 1200 hours on February 15, 1964, and lasted for five hours.

References: (C) (E) (H) (AS) (U4)

Test:	BONEFISH		
Date:	02/18/64	Sponsor:	LASL
Time:	0737 PST	Depth of Burial:	984 ft
Location:	NTS U3bt	Purpose:	Weapons Related
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: 1.9×10^1

xenons, in curies: 1.5×10^1

^{131}I in curies: 2.0×10^{-4}

^{133}I in curies: 4.0

References: (B) (E) (H) (AS)

Test:	KLICKITAT		
Date:	02/20/64	Sponsor:	LRL
Time:	0730 PST	Depth of Burial:	1,616 ft
Location:	NTS U10e	Purpose:	Plowshare
Type:	Shaft	Yield:	20 to 200 kt
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: Less than 1.0×10^1

^{133}Xe in curies: less than 7.9
 ^{135}Xe in curies: less than 1.9
 ^{131}I in curies: less than 2.0×10^{-1}
 ^{133}I in curies: less than 2.0×10^{-1}
 ^{135}I in curies: less than 2.0×10^{-2}

Release Summary: A drillback release occurred from the ventilation system.

References: (C) (E) (H) (AS) (JT)

Test:	HANDICAP		
Date:	03/12/64	Sponsor:	LRL
Time:	0700 PST	Depth of Burial:	470 ft
Location:	NTS U9ba	Purpose:	Weapons Related
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Test and Drillback

Test Release Activity At R+12, in Curies: 3.0×10^2

Isotopes Identified in the Release: ^{87}Kr , ^{88}Kr , ^{88}Rb , ^{131}I , ^{132}I , ^{133}I , ^{134}I , ^{135}I , ^{133}Xe , ^{133m}Xe , ^{135}Xe , ^{138}Xe , and ^{138}Cs

Drillback Release Activity at Time of Release, in Curies: 1.0×10^{-1}

^{133}Xe in curies: 2.0×10^{-2}
 ^{135}Xe in curies: 8.0×10^{-2}

Release Summary: Test releases occurred from the cable cutting at H+110 minutes, lasting for 30 minutes, and from the surface ground zero area at H+6 hours, lasting for 27 hours.

A drillback release occurred through the ventilation system.

References: (C) (H) (AS) (UR)

Test:	PIKE		
Date:	03/13/64	Sponsor:	LASL
Time:	0802 PST	Depth of Burial:	374 ft
Location:	NTS U3cy	Purpose:	Weapons Related
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Offsite	Type of Release:	Test

Test Release at R+12 Hours, in Curies: 1.2×10^5

Isotopes Identified in the Release: ^{131}I , ^{133}I , and ^{135}I

Cloud Direction: Southeasterly over Cactus Springs and Las Vegas, Nevada, and over California and Arizona the next day

Maximum Activity Detected in Air Offsite: 76,000 picocuries of gross beta activity per cubic meter of air five miles west of Cactus Springs, Nevada

Maximum Gamma Exposure Rate Detected Offsite: 5.9 mR/h at Cactus Springs, Nevada

Maximum Iodine Level Detected Offsite: 1,000 picocuries of ^{131}I per cubic meter of air, 36,000 picocuries of ^{133}I per cubic meter of air, and 510 picocuries of ^{135}I per cubic meter of air at Cactus Springs, Nevada; maximum concentration of ^{131}I in commercial milk, 80 picocuries per liter at Yuma, Arizona, and Winterhaven, California

Maximum Distance Radiation Detected Offsite: 0.03 mR/h at 17.8 miles southeast of the junction of Boulder Highway and Sahara Avenue, Las Vegas, Nevada

Release Summary: An test release from ground fractures occurred at H+10 seconds and lasted for approximately one minute. Fresh fission products were detected as far as 341 miles from surface ground zero.

References: (B) (D) (E) (G) (H) (P) (Z) (AS) (DF) (DG) (FA) (JU)

Test:	HOOK		
Date:	04/14/64	Sponsor:	LLNL
Time:	0640 PST	Depth of Burial:	668 ft
Location:	NTS U9bc	Purpose:	Weapons Related
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Test and Drillback

Test Release at R+12 Hours, in Curies: 2.2

Drillback Release Activity at Time of Release, in Curies: Less than 3.5×10^2

^{133}Xe in curies: less than 1.3×10^2

^{135}Xe in curies: less than 2.2×10^2

Release Summary: A test release occurred from the surface ground zero area at H+5 minutes and lasted for 11 minutes.

Drillback releases occurred from the emplacement casing at 2000 hours on April 14, 1964, lasting for 16.5 hours, and from the ventilation system at 1900 hours April 15, 1964, lasting for 13 hours.

References: (C) (E) (H) (AS) (US)

Test:	STURGEON		
Date:	04/15/64	Sponsor:	LASL
Time:	0630 PST	Depth of Burial:	492 ft
Location:	NTS U3bo	Purpose:	Weapons Related
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: 2.3×10^2

^{133}Xe in curies: 9.0×10^1

^{135}Xe in curies: 1.4×10^2

^{131}I in curies: 1.0×10^{-2}

^{133}I in curies: 6.0×10^{-1}

^{135}I in curies: 2.5

References: (B) (E) (H) (AS) (JV)

Test:	BOGEY		
Date:	04/17/64	Sponsor:	LRL
Time:	0729 PST	Depth of Burial:	390 ft
Location:	NTS U9au	Purpose:	Weapons Related
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Test and Drillback

Test Release Activity At R+12, in Curies: 6.9

Isotopes Identified in the Release: ^{87}Kr , ^{88}Kr , ^{133}Xe , ^{135}Xe , ^{138}Xe , and ^{138}Cs

Drillback Release Activity at Time of Release, in Curies: Less than 5.9×10^1

^{133}Xe in curies: less than 4.4×10^1

^{135}Xe in curies: less than 9.5

^{131}I in curies: less than 1.0

^{133}I in curies: less than 1.0

^{135}I in curies: less than 1.0

others, in curies: less than 2.0

Release Summary: Test releases occurred from the cable connectors at H+10 minutes, lasting for eight minutes, and from the cable cuttings at 1000 hours on April 17, 1964, lasting for 30 minutes.

Drillback releases occurred from the drilling stem at 0100 hours on April 19, 1964, lasting for six hours, and from the ventilation system (no time or duration given).

References: (C) (E) (H) (AS) (U1)

Test:	TURF		
Date:	04/24/64	Sponsor:	LRL
Time:	1210 PST	Depth of Burial:	1,663 ft
Location:	NTS U10c	Purpose:	Weapons Related
Type:	Shaft	Yield:	20 to 200 kt
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: Less than 2.0×10^2

^{133}Xe in curies: 1.9×10^2

^{135}Xe in curies: less than 9.8

^{131}I in curies: less than 2.0

^{133}I in curies: less than 2.0

^{135}I in curies: less than 1.0

Release Summary: Drillback releases occurred from the ventilation system drilling platform at 0505 hours on April 27, 1964, lasting for 28 hours, and from the drill hole at 1545 hours on April 28, 1964, lasting for 5 hours, 45 minutes.

References: (C) (E) (H) (AS) (JW) (JX)

Test:	PIPEFISH		
Date:	04/29/64	Sponsor:	LASL
Time:	1347 PDT	Depth of Burial:	860 ft
Location:	NTS U3co	Purpose:	Weapons Related
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Test

Test Release at R+12 Hours, in Curies: 3.0×10^{-6}

Isotopes Identified in the Release: ^{138}Xe

References: (B) (E) (H) (AS) (JY)

Test:	DRIVER		
Date:	05/07/64	Sponsor:	LRL
Time:	0600 PDT	Depth of Burial:	492 ft
Location:	NTS U9ar	Purpose:	Weapons Related
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Test and Drillback

Test Release Activity At R+12, in Curies: 3.7×10^{-1}

Isotopes Identified in the Release: ^{88}Kr , ^{88}Rb , ^{133}I , ^{135}I , ^{133}Xe , ^{135}Xe , and ^{138}Cs

Release Summary: A test release occurred from the surface ground zero casing at H+20 minutes and lasted for 190 minutes.

A drillback release of 0.28 curies of ^{133}Xe and ^{135}Xe could have been released and gone undetected because of lower limits of detection.

References: (C) (E) (H) (AS) (UB)

Test:	BACKSWING		
Date:	05/14/64	Sponsor:	LRL
Time:	0740 PDT	Depth of Burial:	536 ft
Location:	NTS U9aw	Purpose:	Weapons Related
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Test and Drillback

Test Release at R+12 Hours, in Curies: 3.7×10^{-1}

Isotopes Identified in the Release: ^{24}Na , ^{56}Mn , ^{131}I , ^{133}I , ^{135}I , ^{135}Xe , ^{138}Xe , and ^{138}Cs

Drillback Release Activity at Time of Release, in Curies: 1.0×10^3

^{133}Xe in curies:	3.2
^{135}Xe in curies:	3.1
^{138}Xe , ^{135}Xe , and ^{138}Cs in curies:	1.0×10^3
iodines:	1.3×10^1

Release Summary: A test release occurred from the surface ground zero casing and LOS pipe at H+4 minutes and lasted for 16 minutes.

Drillback releases occurred from the cable cutting at 0840 hours on May 14, 1964, lasting for 24 hours, and from the ventilation system at 1135 hours on May 16, 1964, lasting for 48 hours.

References: (C) (E) (H) (X) (AS) (JZ)

Test:	ACE		
Date:	06/11/64	Sponsor:	LLNL
Time:	0945 PDT	Depth of Burial:	862 ft
Location:	NTS U2n	Purpose:	Plowshare
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Test and Drillback

Test Release at R+12 Hours, in Curies: 9.3

Isotopes Identified in the Release: ^{131}I , ^{133}I , ^{135}I , ^{133}Xe , ^{135}Xe , ^{138}Xe , and ^{138}Cs

Drillback Release Activity at Time of Release, in Curies: Less than 2.0×10^{-1}

^{133}Xe and ^{135}Xe in curies: less than 2.0×10^{-1}

Release Summary: A test release from the cable cutting area and surface ground zero occurred at H+2.5 hours and lasted for 18 hours.

References: (C) (E) (H) (AS) (KA)

Test:	DUFFER		
Date:	06/18/64	Sponsor:	LLNL
Time:	0630 PDT	Depth of Burial:	1,463 ft
Location:	NTS U10dS	Purpose:	Weapons Related
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: Less than 4.1×10^1

^{133}Xe in curies: less than 3.5×10^1

^{135}Xe in curies: less than 5.8

Release Summary: Three drillback releases occurred from: (1) the emplacement drill hole, beginning at 1033 hours on June 19, 1964, lasting for five minutes; (2) the ventilation system at 0430 hours on June 21, 1964, lasting for 80 minutes; and (3) an explosion at the emplacement hole during the period of July 2 through July 6, 1964.

References: (C) (E) (H) (AS) (UC)

Test:	FADE		
Date:	06/25/64	Sponsor:	LLNL
Time:	0630 PDT	Depth of Burial:	673 ft
Location:	NTS U9be	Purpose:	Weapons Related
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Test and Drillback

Test Release at R+12 Hours, in Curies: 3.5×10^1

Isotopes Identified in the Release: ^{88}Kr , ^{88}Rb , ^{131}I , ^{133}I , ^{135}I , ^{133}Xe , ^{133m}Xe , ^{135}Xe , and ^{135m}Xe

Drillback Release Activity at Time of Release, in Curies: Less than 1.0

^{133}Xe and ^{135}Xe in curies: less than 1.0

Release Summary: A test release, from the surface ground zero area in the crater, occurred at H+165 minutes and lasted for 8.75 hours.

References: (C) (E) (H) (AS) (KB)

Test:	DUB		
Date:	06/30/64	Sponsor:	LLNL
Time:	0633 PDT	Depth of Burial:	848 ft
Location:	NTS U10a	Purpose:	Plowshare
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Test and Drillback

Test Release at R+12 Hours, in Curies: 5.0

Isotopes Identified in the Release: ^{131}I , ^{133}I , ^{135}I , ^{133}Xe , and ^{135}Xe

Drillback Release Activity at Time of Release, in Curies: 2.4×10^1

^{133}Xe in curies: 2.2×10^1

^{135}Xe in curies: 2.3

Release Summary: A test release from the crater area occurred at approximately H+5 hours and lasted for 83 hours.

A drillback release from the ventilation system occurred at 0530 hours on July 2, 1964, and lasted for 85 hours.

References: (C) (E) (H) (AS) (KC)

Test:	BYE		
Date:	07/16/64	Sponsor:	LRL
Time:	0615 PDT	Depth of Burial:	1,277 ft
Location:	NTS U10i	Purpose:	Weapons Related
Type:	Shaft	Yield:	20 to 200 kt
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: Less than 3.9×10^2

^{133}Xe in curies: less than 3.9×10^2

^{135}Xe in curies: less than 1.0

^{131}I in curies: less than 1.0

^{133}I in curies: less than 1.0

Release Summary: Drillback releases occurred from the ventilation system at 1730 hours on July 21, 1964, lasting for 49.5 hours, and from the open drill pipe at 0730 hours on July 22, 1964, lasting for 15.5 hours.

References: (C) (E) (H) (AT) (KD)

Test:	CORMORANT		
Date:	07/17/64	Sponsor:	LASL/UK
Time:	1018 PDT	Depth of Burial:	892 ft
Location:	NTS U3df	Purpose:	Joint US-UK
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Test and Drillback

Test Release at R+12 Hours, in Curies: Approximately 1.0

Isotopes Identified in the Release: ^{131}I , ^{133}I , ^{135}I , ^{135}Xe , and ^{138}Xe

Drillback Release Activity at Time of Release, in Curies: 1.1×10^1

^{133}Xe in curies: 1.1×10^1

^{135}Xe in curies: 1.4×10^{-2}

^{131}I in curies: 1.4×10^{-2}

^{133}I in curies: 1.7×10^{-2}

^{135}I in curies: 5.8×10^{-5}

Release Summary: A test release from the surface ground zero area began at H time and lasted for 20 minutes.

References: (B) (E) (H) (AT)

Test:	LINKS		
Date:	07/23/64	Sponsor:	LLNL
Time:	0630 PDT	Depth of Burial:	394 ft
Location:	NTS U9bf	Purpose:	Weapons Related
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Test and Drillback

Test Release Activity At R+12, in Curies: Less than 6.7

Isotopes Identified in the Release: ^{87}Kr , ^{88}Kr , ^{88}Rb , ^{88m}Rb , ^{133}Xe , ^{135}Xe , ^{138}Xe , ^{139}Xe , ^{138}Cs , ^{139}Cs , and ^{139}Ba

Release Summary: Test releases occurred from from surface ground zero at H+10 seconds lasting for sixty minutes, and from the cable cutting at 0830 hours on July 23, 1964, lasting for 1.5 hours.

References: (C) (E) (H) (AT) (UU)

Test:	ALVA		
Date:	08/19/64	Sponsor:	LLNL
Time:	0900 PDT	Depth of Burial:	545 ft
Location:	NTS U2j	Purpose:	Weapons Related
Type:	Shaft	Yield:	4.4 kt
Release Detected:	Offsite	Type of Release:	Test and Drillback

Test Release at R+12 Hours, in Curies: 6.1×10^3

Isotopes Identified in the Release: ^{56}Mn , ^{131}I , ^{132}I , ^{133}I , ^{134}I , ^{135}I , ^{133}Xe , ^{135}Xe , and ^{138}Cs

Cloud Direction: Northerly

Maximum Activity Detected in Air Offsite: No fresh fission products were detected.

Maximum Gamma Exposure Rate Detected Offsite: No radiation intensities above background levels were measured.

Maximum Iodine Level Detected Offsite: No iodine detected was attributable to this test.

Maximum Distance Radiation Detected Offsite: Detected offsite by aircraft only, near St. George, Utah

Drillback Release Activity at Time of Release, in Curies: 3.0×10^2

^{133}Xe in curies: 3.0×10^2

^{135}Xe in curies: 2.5×10^{-1}

^{131}I in curies: 4.1×10^{-2}

^{133}I in curies: 5.5×10^{-2}

Release Summary: A test release from the LOS pipe and shaft occurred at H time and lasted for 3.5 days. The release of radioactivity was detected offsite by aircraft only.

A drillback release occurred from the drilling rig at 2200 hours on August 22, 1964, and lasted for 5.4 days.

References: (C) (E) (H) (Z) (AT) (DH) (EC) (GW) (KE) (MA)

Test: **CANVASBACK**

Date: 08/22/64 **Sponsor:** LASL

Time: 1517 PDT **Depth of Burial:** 1,470 ft

Location: NTS U3cp **Purpose:** Weapons Related

Type: Shaft **Yield:** Less than 20 kt

Release Detected: Onsite Only **Type of Release:** Drillback

Drillback Release Activity at Time of Release, in Curies: 2.0×10^3

Xe^{133} in curies: 2.0×10^3

Xe^{135} in curies: 1.0

I^{131} in curies: 2.0×10^{-1}

I^{133} in curies: 5.0×10^{-1}

I^{135} in curies: 1.0×10^{-3}

References: (B) (E) (H) (AT) (TV)

Test:	SPOON		
Date:	09/11/64	Sponsor:	LRLL
Time:	0700 PDT	Depth of Burial:	590 ft
Location:	NTS U9bd	Purpose:	Weapons Related
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: 3.9×10^2

^{133}Xe in curies: 3.8×10^2

^{135}Xe in curies: 1.3×10^1

^{131}I and ^{133}I in curies: 4.0×10^{-1}

Release Summary: A drillback release occurred from the ventilation system at 2310 hours on September 13, 1964, and lasted for 24.5 hours. A second release occurred from the drilling rig at 2315 hours on September 13, 1964, and lasted for 27.7 hours.

References: (C) (E) (H) (AT) (UO)

Test:	PAR		
Date:	10/09/64	Sponsor:	LRLL
Time:	0700 PDT	Depth of Burial:	1,325 ft
Location:	NTS U2p	Purpose:	Plowshare
Type:	Shaft	Yield:	38 kt
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: 6.1×10^2

^{133}Xe in curies: 5.9×10^2

^{133m}Xe in curies: 2.4

^{135}Xe in curies: 2.1×10^1

other isotopes in curies: less than 2.0

Release Summary: Drillback releases occurred from the drilling rig at 2230 hours on October 11, 1964, lasting for 4.4 days and from the ventilation system at 0100 hours on October 12, 1964, lasting for 5.5 days.

References: (C) (E) (H) (X) (AT) (KF)

Detonation:	BARBEL (simultaneous with TURNSTONE, separate holes)		
Date:	10/16/64	Sponsor:	LASL
Time:	0900 PDT	Depth of Burial:	850 ft
Location:	NTS U3bx	Purpose:	Weapons Related
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: 2.9×10^2

^{133}Xe in curies:	1.9×10^2
^{135}Xe in curies:	9.8×10^1
^{131}I in curies:	4.1×10^{-1}
^{133}I in curies:	2.9×10^{-1}
^{135}I in curies:	3.1×10^{-1}

References: (B) (E) (H) (AT)

Test:	FOREST		
Date:	10/31/64	Sponsor:	LRL
Time:	0904 PST	Depth of Burial:	1,249 ft
Location:	NTS U7a	Purpose:	Weapons Related
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: 5.2

^{133}Xe in curies:	5.0
^{135}Xe in curies:	2.0×10^{-1}
^{131}I and ^{133}I in curies:	2.0×10^{-3}

Release Summary: A drillback release occurred from the drilling rig at 0730 hours on November 3, 1964, and lasted for seven hours.

References: (C) (E) (H) (AT) (KG)

Test:	HANDCAR		
Date:	11/05/64	Sponsor:	LRL
Time:	0700 PST	Depth of Burial:	1,322 ft
Location:	NTS U10b	Purpose:	Plowshare
Type:	Shaft	Yield:	12 kt
Release Detected:	Onsite Only	Type of Release:	Test and Drillback

Test Release at R+12 Hours, in Curies: 6.4×10^1

Isotopes Identified in the Release: ^{87}Kr , ^{88}Kr , and ^{135}Xe

Drillback Release Activity at Time of Release, in Curies: 5.5

^{133}Xe in curies: 5.5

Release Summary: Test releases occurred from surface ground zero cables at H time, lasting for three hours, and at H+16 hours, lasting for eight hours.

A drillback release from the ventilation system occurred at 2030 hours on December 1, 1964, and lasted for eight days.

References: (C) (E) (H) (AT) (J6)

Test:	CREPE		
Date:	12/05/64	Sponsor:	LRL
Time:	1315 PST	Depth of Burial:	1,326 ft
Location:	NTS U2q	Purpose:	Weapons Related
Type:	Shaft	Yield:	20 to 200 kt
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: 2.5×10^2

^{133}Xe in curies: 2.4×10^2

^{133m}Xe in curies: 6.1

^{135}Xe in curies: 4.0×10^{-1}

Release Summary: Drillback releases occurred from: (1) the ventilation system at 1830 hours on December 9, 1964, lasting for 2.6 days; (2) the crater at 2145 hours on December 9, 1964, lasting for 1.3 days; and (3) the ventilation system at 1025 hours on December 13, 1964, lasting for one hour.

References: (C) (E) (H) (AT) (KH)

Detonation:	DRILL (SOURCE-LOWER) (simultaneous with DRILL [TARGET-UPPER], same hole)		
Date:	12/05/64	Sponsor:	LLNL
Time:	1315 PST	Depth of Burial:	722 ft
Location:	NTS U2ai	Purpose:	Weapons Related
Type:	Shaft	Yield:	3.4 kt
Release Detected:	Offsite	Type of Release:	Test and Drillback

Test Release at R+12 Hours, in Curies: 6.1×10^4

Isotopes Identified in the Release: ^{56}Mn , ^{87}Kr , ^{88}Kr , ^{88}Rb , ^{131}I , ^{133}I , ^{135}I , ^{132}Te , ^{133}Xe , ^{133m}Xe , ^{135}Xe , ^{138}Xe , ^{137}Cs , ^{138}Cs , and ^{142}La

Cloud Direction: Southerly; east of Lathrop Wells, Nevada

Maximum Activity Detected in Air Offsite: 0.62 picocuries of gross beta activity per cubic meter of air at Death Valley Junction, California, and 1.6 picocuries of ^{135}Xe per cubic meter of air at Lathrop Wells, Nevada

Maximum Gamma Exposure Rate Detected Offsite: 0.20 mR/h on Highway 95, five miles east of Lathrop Wells, Nevada

Maximum Iodine Level Detected Offsite: 1.1 picocuries of ^{131}I per cubic meter of air at Shoshone, California; 300 picocuries of ^{131}I per kilogram, 300 picocuries of ^{133}I per kilogram, and 60 picocuries of ^{132}I per kilogram were measured in vegetation samples five miles east of Lathrop Wells, Nevada

Maximum Distance Radiation Detected Offsite: 0.01 mR/h at 17 miles south of Lathrop Wells, Nevada, on Highway 29

Drillback Release Activity at Time of Release, in Curies: 4.2×10^2

^{133}Xe in curies: 4.1×10^2

^{133m}Xe in curies: 5.3

^{131}I in curies: less than 1.0

^{133}I in curies: less than 1.0

Release Summary: Test releases occurred from the crater at H+20 minutes, lasting for 9.5 hours and at H+10 hours, lasting for 5.4 days. An EG&G NATS plane traced the effluent south over the Mojave Desert east of Barstow, California, towards Yuma, Arizona.

A drillback release from the drilling rig occurred at 1500 hours on December 14, 1964, and lasted for 1.6 days.

References: (C) (E) (H) (Z) (AT) (DI) (ED) (KI) (KJ) (UA)

Test:	PARROT		
Date:	12/16/64	Sponsor:	LASL
Time:	1200 PST	Depth of Burial:	591 ft
Location:	NTS U3dk	Purpose:	Weapons Related
Type:	Shaft	Yield:	1.3 kt
Release Detected:	Offsite	Type of Release:	Test

Test Release at R+12 Hours, in Curies: 2.3×10^5

Isotopes Identified in the Release: ^{85m}Kr , ^{131}I , ^{133}I , ^{135}I , ^{135}Xe , ^{138}Xe , and ^{138}Cs

Cloud Direction: Northerly over Highway 25 (Nevada)

Maximum Activity Detected in Air Offsite: 74 picocuries of gross beta activity per cubic meter of air at 12 miles northwest of Hancock Summit, Nevada

Maximum Gamma Exposure Rate Detected Offsite: 0.14 mR/h along Highway 25

Maximum Iodine Level Detected Offsite: 0.6 picocuries of ^{131}I per cubic meter at Warm Springs Ranch, Nevada, and 6.6 picocuries of ^{133}I per cubic meter of air at Indian Springs, Nevada

Maximum Distance Radiation Detected Offsite: 0.015 mR/h at 22 miles south of Sunnyside, Nevada, on Sunnyside Road

Release Summary: The PARROT test released radioactive effluent that was characterized by an initial burst followed by a continuous leaking of a relatively small amount of activity. The test release started at H+10 minutes and lasted for approximately eight days. The mechanism of this release was later found to be a crack in the LOS pipe below the surface. The release was approximately 45% ^{138}Cs , 45% ^{85m}Kr , and 10% ^{135}Xe (with traces of iodines).

References: (B) (D) (E) (G) (H) (Z) (AT) (EE) (EF) (FB) (GX) (GY) (KJ) (L3) (MB)

Test:	MUDPACK		
Date:	12/16/64	Sponsor:	DoD/LRL
Time:	1210 PST	Depth of Burial:	498 ft
Location:	NTS U10n	Purpose:	Weapons Effects
Type:	Shaft	Yield:	2.7 kt
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: Less than 5.4×10^1

^{133}Xe in curies:	5.0×10^1
$^{133\text{m}}\text{Xe}$ in curies:	2.0
^{135}Xe in curies:	less than 1.0
^{131}I , ^{133}I , and ^{135}I in curies:	less than 1.0

Release Summary: A drillback release occurred from the crater area at 1030 hours on December 19, 1964, and lasted for 12 hours.

References: (C) (E) (H) (AT) (KK) (KL)

Test:	SULKY		
Date:	12/18/64	Sponsor:	LRL
Time:	1135 PST	Depth of Burial:	90 ft
Location:	NTS U18d	Purpose:	Plowshare
Type:	Shaft	Yield:	92 tons
Release Detected:	Offsite	Type of Release:	Test

Test Release at R+12 Hours, in Curies: 1.3×10^5

Isotopes Identified in the Release: $^{85\text{m}}\text{Kr}$, ^{87}Kr , ^{88}Kr , ^{89}Sr , ^{91}Sr , ^{91}Y , ^{131}I , ^{132}I , ^{133}I , ^{134}I , ^{135}I , ^{133}Xe , ^{135}Xe , ^{138}Xe , ^{138}Cs , ^{139}Ba , and ^{140}Ba

Cloud Direction: Northerly, between Clark Station and Nyala, Nevada

Maximum Activity Detected in Air Offsite: No fresh fission products were detected in air samples.

Maximum Gamma Exposure Rate Detected Offsite: 0.06 mR/h at Nyala, Nevada

Maximum Iodine Level Detected Offsite: No iodines were detected in air, milk, or water samples.

Maximum Distance Radiation Detected Offsite: 0.02 mR/h on Highway 6, 19 miles west of Lockes, Nevada

Release Summary: The planned test release occurred from the surface ground zero area at H+1 second and lasted for 35 days.

References: (C) (E) (G) (H) (AT) (DJ) (GY)

Test:	WOOL		
Date:	01/14/65	Sponsor:	LRL
Time:	0800 PST	Depth of Burial:	706 ft
Location:	NTS U9bh	Purpose:	Weapons Related
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: 2.0×10^2

^{133}Xe in curies:	1.9
$^{133\text{m}}\text{Xe}$ in curies:	6.0×10^{-2}
^{135}Xe in curies:	2.0×10^2
^{135}I in curies:	less than 1.0
other isotopes in curies:	less than 1.0

Release Summary: Drillback releases occurred from the surface ground zero casing at 1730 hours on January 14, 1965, lasting for 2.5 hours, and from the ventilation system at 0150 hours on January 15, 1965, lasting for 3.3 days.

References: (C) (E) (H) (AT) (KM)

Test:	TERN		
Date:	01/29/65	Sponsor:	LASL
Time:	1022 PST	Depth of Burial:	689 ft
Location:	NTS U3dw	Purpose:	Weapons Related
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Test

Test Release Activity at R+12 Hours, in Curies: 1.7×10^2

Isotopes Identified in the Release: ^{133}Xe , and ^{135}Xe

Release Summary: A test release occurred from the surface ground zero area at H+6.7 hours and lasted for approximately 4.6 days.

References: (B) (E) (H) (AT)

Test:	CASHMERE		
Date:	02/04/65	Sponsor:	RL
Time:	0730 PST	Depth of Burial:	762 ft
Location:	NTS U2ad	Purpose:	Weapons Related
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: 7.9

^{133}Xe in curies: 7.8

$^{133\text{m}}\text{Xe}$ in curies: 1.1×10^{-1}

Release Summary: A drillback release occurred from the ventilation system at 0300 hours on February 14, 1965, and lasted for 4.2 hours.

References: (C) (E) (H) (AT) (TW)

Test:	ALPACA		
Date:	02/12/65	Sponsor:	RL
Time:	0710 PST	Depth of Burial:	737 ft
Location:	NTS U2a	Purpose:	Weapons Related
Type:	Shaft	Yield:	330 tons
Release Detected:	Offsite	Type of Release:	Test

Test Release at R+12 Hours, in Curies: 4.0×10^4

Isotopes Identified in the Release: ^{89}Kr , ^{89}Sr , ^{89}Rb , ^{131}I , ^{133}I , ^{135}I , ^{133}Xe , ^{135}Xe , ^{137}Xe , ^{138}Xe , ^{137}Cs , and ^{138}Cs

Cloud Direction: Southerly direction to Highway 95 (Nevada)

Maximum Activity Detected in Air Offsite: 19 picocuries of gross beta activity per cubic meter of air at Barstow, California

Maximum Gamma Exposure Rate Detected Offsite: 0.01 mR/h at the junction of Highway 95 and the Mercury turnoff

Maximum Iodine Level Detected Offsite: No iodines were detected in air, milk, or vegetation samples.

Maximum Distance Radiation Detected Offsite: Readings were at background levels; 0.004 mR/h at Johnnie's Mine, Nevada

Release Summary: Test releases occurred from the surface ground zero area at H hour, lasting for 30 minutes, at H+30 minutes, lasting for three hours, and at H+3.5 hours, lasting for five hours.

References: (C) (D) (E) (H) (Z) (AT) (GZ) (KN) (MC)

Test:	MERLIN		
Date:	02/16/65	Sponsor:	LASL
Time:	0930 PST	Depth of Burial:	971 ft
Location:	NTS U3ct	Purpose:	Weapons Related
Type:	Shaft	Yield:	10.1 kt
Release Detected:	Onsite Only	Type of Release:	Test

Test Release at R+12 Hours: Trace

Release Summary: A test release from the surface ground zero area started at H+13.5 hours and lasted for 5 days.

References: (B) (E) (H) (AT)

Test:	WISHBONE		
Date:	02/18/65	Sponsor:	DoD/LRL
Time:	0818 PST	Depth of Burial:	588 ft
Location:	NTS U5a	Purpose:	Weapons Effects
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Test and Drillback

Test Release at R+12 Hours, in Curies: 6.9×10^3

Isotopes Identified in the Release: ^{85m}Kr , ^{87}Kr , ^{88}Kr , ^{131}I , ^{133}I , ^{135}I , ^{133}Xe , ^{133m}Xe , and ^{135}Xe

Drillback Release Activity at Time of Release, in Curies: 1.6×10^4

^{133}Xe in curies: 1.2×10^4

^{133m}Xe in curies: 4.7

^{135}Xe in curies: 4.1×10^3

^{131}I in curies: 1.3

^{133}I in curies: 1.5×10^1

^{135}I in curies: 2.6×10^1

Release Summary: Test releases occurred from surface ground zero as follows: (1) at H+4 minutes, lasting for 20 minutes; (2) at H+135 minutes, lasting for 6.4 hours; and (3) at H+12.6 hours, lasting for 4.6 hours.

Drillback releases occurred from: (1) the drilling rig at 0415 hours on February 19, 1965, lasting for nine days; (2) the ventilation system at 0905 hours on February 19, 1965, lasting for 46 hours; (3) the ventilation system at 1730 hours on February 25, 1965, lasting for 37 hours.

References: (C) (E) (H) (AT) (KO) (KP) (KQ) (MD)

Test:	SEERSUCKER		
Date:	02/19/65	Sponsor:	LLNL
Time:	0728 PST	Depth of Burial:	472 ft
Location:	NTS U9bm	Purpose:	Weapons Related
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Test and Drillback

Test Release Activity at R+12 Hours, in Curies: 1.3

Isotopes Identified in the Release: ^{87}Kr , ^{88}Kr , ^{88}Rb , and ^{135}Xe

Drillback Release Activity at Time of Release, in Curies: Less than 4.1×10^1

^{133}Xe in curies: 1.9×10^1

^{135}Xe in curies: 2.1×10^1

iodines, in curies: less than 1.0

Release Summary: A test release occurred from the surface ground zero area at H+9 minutes and lasted for 22 minutes.

A drillback release occurred from the drilling rig at 2335 hours on February 20, 1965, and lasted for 31.5 hours.

References: (C) (E) (H) (AT) (UI)

Test:	WAGTAIL		
Date:	03/03/65	Sponsor:	LASL
Time:	1113 PST	Depth of Burial:	2,461 ft
Location:	NTS U3an	Purpose:	Weapons Related
Type:	Shaft	Yield:	20 to 200 kt
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: 1.3×10^1

^{133}Xe in curies: 1.3×10^1

^{131}I in curies: 3.0×10^{-2}

^{133}I in curies: 2.0×10^{-2}

Release Summary: A drillback release occurred on March 10, 1965.

References: (B) (E) (H) (AT) (J4)

Test:	SUEDE		
Date:	03/20/65	Sponsor:	LRL
Time:	0723 PST	Depth of Burial:	469 ft
Location:	NTS U9bk	Purpose:	Weapons Related
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: 1.3×10^3

^{133}Xe in curies: 9.6×10^2

$^{133\text{m}}\text{Xe}$ in curies: 5.7×10^{-1}

^{135}Xe in curies: 3.2×10^2

^{131}I in curies: 1.0×10^{-1}

^{133}I in curies: 1.6

^{135}I in curies: 8.9×10^{-1}

Release Summary: A release occurred from the drilling rig at 1445 hours on March 21, 1965, lasting for 15.5 hours. Another drillback release occurred from the ventilation system at 2330 hours on March 21, 1965, lasting for 21 hours.

References: (C) (E) (H) (AT) (UP)

Test:	CUP		
Date:	03/26/65	Sponsor:	LRL
Time:	0734 PST	Depth of Burial:	1,761 ft
Location:	NTS U9cb	Purpose:	Weapons Related
Type:	Shaft	Yield:	20 to 200 kt
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: 4.7×10^3

^{133}Xe in curies: 4.3×10^3

$^{133\text{m}}\text{Xe}$ in curies: 1.4×10^2

^{135}Xe in curies: 2.3×10^2

^{131}I in curies: 3.0×10^{-1}

^{133}I in curies: 7.0×10^{-1}

Release Summary: Drillback releases occurred from: (1) the ventilation system at 1450 hours on March 29, 1965, lasting for 89 hours; (2) the drilling rig at 1520 hours on April 3, 1965, lasting for eight hours; and (3) the ventilation system at 2120 hours on April 4, 1965, lasting for 6.3 hours.

References: (C) (E) (H) (AT) (KR)

Test: KESTREL

Date: 04/05/65 **Sponsor:** LASL

Time: 1300 PST **Depth of Burial:** 1,467 ft

Location: NTS U3dd **Purpose:** Weapons Related

Type: Shaft **Yield:** Less than 20 kt

Release Detected: Onsite Only **Type of Release:** Drillback

Drillback Release Activity at Time of Release, in Curies: 2.3×10^2

^{133}Xe in curies: 2.3×10^2

^{135}Xe in curies: 1.9×10^{-1}

^{131}I in curies: 2.9×10^{-2}

^{133}I in curies: 9.0×10^{-2}

^{135}I in curies: 2.9×10^{-4}

Release Summary: A release occurred on April 10, 1965, beginning at 0535 hours and lasting for 16.5 hours.

References: (B) (E) (H) (AT) (J7)

PALANQUIN

Test:	PALANQUIN		
Date:	04/14/65	Sponsor:	LRL
Time:	0514 PST	Depth of Burial:	280 ft
Location:	NTS U20k	Purpose:	Plowshare
Type:	Crater	Yield:	4.3 kt
Release Detected:	Offsite	Type of Release:	Test/Crater

Test Release at R+12 Hours, in Curies: 1.1×10^7

Isotopes Identified in the Release: ^{91}Sr , ^{91m}Y , ^{95}Zr / ^{95}Nb , ^{97}Zr / ^{97}Nb , ^{99}Mo , ^{99}Tc , ^{131}I , ^{133}I , ^{135}I , ^{135}Xe , and ^{140}Ba / ^{140}La

Cloud Direction: Northerly to Pine Creek Ranch, Nevada

Maximum Activity Detected in Air Offsite: 23,000 picocuries of gross beta activity per cubic meter of air at Clark Station, Nevada (populated site); highest concentration in an unpopulated site, 87,000 picocuries of gross beta activity per cubic meter of air at Highway 6, eight miles east of the Tonopah Test Range Road

Maximum Gamma Exposure Rate Detected Offsite: 3 mR/h at Stone Cabin Ranch, Nevada

Maximum Iodine Level Detected Offsite: 32,000 picocuries of ^{135}I per cubic meter of air, 16,000 picocuries of ^{133}I per cubic meter of air, and 4,100 picocuries of ^{131}I per cubic meter of air at Clark Station, Nevada (populated site); highest concentration in an unpopulated site, 12,000 picocuries of ^{131}I per cubic meter of air, 65,000 picocuries of ^{133}I per cubic meter of air and 160,000 picocuries of ^{135}I per cubic meter of air at Highway 6, eight miles east of the Tonopah Test Range Road; highest ^{131}I concentration in milk, 11,000 picocuries per liter at Martin Ranch near Eureka, Nevada; no children present

Maximum Distance Radiation Detected Offsite: 0.03 mR/h at Council, Idaho

Release Summary: The planned test release occurred at the surface ground zero area at H hour and lasted for one minute.

References: (C) (E) (H) (M) (AT) (DK) (GY) (KS)

GUM DROP

Test:	GUM DROP		
Date:	04/21/65	Sponsor:	DoD/LRL
Time:	1400 PST	Depth of Burial:	1,000 ft
Location:	NTS U16a.02	Purpose:	Weapons Effects
Type:	Tunnel	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Controlled and Drillback

Controlled Release Activity at Time of Release, in Curies: 1.9×10^3

Isotopes Detected in Release: Primarily ^{135}Xe

Drillback Release Activity at Time of Release, in Curies: 2.3×10^{-1}

^{133}Xe and $^{133\text{m}}\text{Xe}$ in curies: 2.3×10^{-1}

Release Summary: A controlled, filtered ventilation of the tunnel complex occurred between H+3.5 hours and H+34 hours. Activity was primarily noble gases (xenon-135).

A drillback release from the ventilation system occurred at 0130 hours on May 2, 1965, and lasted for 66 hours.

References: (C) (E) (H) (L) (AT) (KT) (KU) (L4)

Test: CHENILLE

Date:	04/22/65	Sponsor:	LLNL
Time:	0539 PST	Depth of Burial:	459 ft
Location:	NTS U9bg	Purpose:	Weapons Related
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Test and Drillback

Test Release Activity at R+12 Hours, in Curies: 9.3×10^{-1}

Isotopes Identified in the Release: ^{138}Xe and ^{138}Cs

Drillback Release Activity at Time of Release, in Curies: Less than 1.1×10^2

^{133}Xe and $^{133\text{m}}\text{Xe}$ in curies: less than 2.0×10^1

^{135}Xe in curies: less than 9.0×10^1

^{131}I , ^{133}I , and ^{135}I in curies: 3.8×10^{-3}

Release Summary: A test release occurred from the emplacement casing at H+50 minutes and lasted for 17 minutes.

A drillback release occurred from the drilling rig at 0630 hours on April 23, 1965, and lasted for nine hours. A second release occurred from the ventilation system at 1020 hours on April 23, 1965, and lasted for 11.6 hours.

References: (C) (E) (H) (X) (AT) (U6)

Test:	TEE		
Date:	05/07/65	Sponsor:	LRL
Time:	0847 PDT	Depth of Burial:	624 ft
Location:	NTS U2ab	Purpose:	Weapons Effects
Type:	Shaft	Yield:	7 kt
Release Detected:	Offsite	Type of Release:	Test and Drillback

Test Release at R+12 Hours, in Curies: 1.6×10^3

Isotopes Identified in the Release: ^{24}Na , ^{87}Kr , ^{88}Kr , ^{91}Kr , ^{91}Sr , ^{122}Sb , ^{124}Sb , ^{131}I , ^{133}I , ^{135}I , ^{132}I , ^{132}Te , ^{133}Xe , ^{135}Xe , ^{139}Xe , ^{140}Xe , ^{138}Cs , ^{139}Ba , and ^{140}Ba

Cloud Direction: Southerly to Highway 95 (Nevada)

Maximum Activity Detected in Air Offsite: 28 picocuries of gross beta activity per cubic meter of air at four miles east of the junction of Highway 95 and Mercury turnoff.

Maximum Gamma Exposure Rate Detected Offsite: 0.05 mR/h at four miles east of the Mercury turnoff on Highway 95

Maximum Iodine Level Detected Offsite: None was detected in air samples. Iodine-133 was detected on sage brush near the junction of Highway 95 and Mercury turnoff.

Maximum Distance Radiation Detected Offsite: 0.05 mR/h at 14 miles south of the Mercury turnoff on Highway 95

Drillback Release Activity at Time of Release, in Curies: 2.0×10^1

^{133}Xe in curies: 9.1

^{133m}Xe in curies: 3.6×10^{-1}

^{135}Xe in curies: 1.1×10^{-1}

^{133}I in curies: low levels

Release Summary: Test releases occurred from the LOS pipe at surface ground zero at H+1.2 minutes, lasting for six minutes and from the surface ground zero area at H+8 minutes, lasting for 107 hours.

A drillback release from the ventilation system occurred at 1400 hours on May 9, 1965, and lasted for three hours.

References: (C) (D) (E) (H) (P) (Z) (AT) (EG) (FC) (GY) (HA) (KV)

Test:	TWEED		
Date:	05/21/65	Sponsor:	LRRL
Time:	0608 PDT	Depth of Burial:	922 ft
Location:	NTS U9bn	Purpose:	Weapons Related
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: 6.0×10^2

^{133}Xe in curies: 3.3×10^2

$^{133\text{m}}\text{Xe}$ in curies: 8.6

^{135}Xe in curies: 2.6×10^2

^{131}I in curies: 1.4×10^{-2}

^{133}I in curies: 6.8×10^{-3}

Release Summary: Drillback releases occurred from the ventilation system at 1300 hours on May 22, 1965, lasting for four days, and from the drilling rig at 0700 hours on May 25, 1965, lasting for five days.

References: (C) (E) (H) (AT) (KW)

Test:	ORGANDY		
Date:	06/11/65	Sponsor:	LRRL
Time:	1328 PDT	Depth of Burial:	551 ft
Location:	NTS U9bo	Purpose:	Weapons Related
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: 1.3×10^1

^{133}Xe in curies: 7.5

$^{133\text{m}}\text{Xe}$ in curies: 5.0×10^{-1}

^{135}Xe in curies: 4.5

iodines, in curies: less than 1.0

Release Summary: A drillback release occurred from the drilling rig at 2215 hours on June 11, 1965, and lasted for 39 hours. A second release from the ventilation system occurred at 1100 hours on June 12, 1965, and lasted for 38 hours.

References: (C) (E) (H) (AT) (UW)

Test:	DILUTED WATERS		
Date:	06/16/65	Sponsor:	DoD/LRL
Time:	0930 PDT	Depth of Burial:	625 ft
Location:	NTS U5b	Purpose:	Weapons Effects
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Offsite	Type of Release:	Test

Test Release at R+12 Hours, in Curies: 3.0×10^4

Isotopes Identified in the Release: ^{99}Mo , ^{103}Ru , ^{105}Ru , ^{131}I , ^{133}I , ^{134}I , ^{135}I , ^{132}Te , ^{135}Xe , ^{138}Cs , ^{139}Ba , ^{140}Ba / ^{140}La , ^{141}Ce , and kryptons

Cloud Direction: Northeasterly to Highway 25

Maximum Activity Detected in Air Offsite: 7.6 picocuries of gross beta activity per cubic meter of air at Nyala, Nevada

Maximum Gamma Exposure Rate Detected Offsite: 0.02 mR/h just off the Test Range Complex

Maximum Iodine Level Detected Offsite: 130 picocuries of ^{131}I per liter in milk at Duckwater, Nevada; probably not attributable to this test as no short-lived iodines were found*

Maximum Distance Radiation Detected Offsite: 0.02 mR/h just off the Test Range Complex

Release Summary: Venting occurred at zero time until H+20 minutes due to a stemming failure. There was a gross fission product release.

References: (C) (D) (E) (H) (K) (L) (P) (Z) (AT) (EW) (GY) (HB) (HC) (ME)

*Two tests occurred prior to the DILUTED WATERS test that were probably responsible for the ^{131}I found in milk samples collected for DILUTED WATERS. One test was the detonation of a nuclear device on the Chinese mainland on May 14, 1965, and the other was a test of a nuclear rocket engine at the Nuclear Rocket Development Station on May 20, 1965. The iodine isotopes found in milk samples subsequent to the DILUTED WATERS test were probably the result of the three tests, and it is not possible to assess the exact contribution from any one source.

Test:	TINY TOT		
Date:	06/17/65	Sponsor:	DoD/LASL
Time:	1000 PDT	Depth of Burial:	364 ft
Location:	NTS U15e	Purpose:	Weapons Effects
Type:	Tunnel	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Uncontrolled

Uncontrolled Release at R+12 Hours, in Curies: 7.0

Isotopes Identified in the Release: ^{87}Kr , ^{88}Kr , ^{135}Xe , ^{138}Xe , ^{138}Cs , and iodines

Release Summary: A test release began from the area of the shaft and cables at H+15 minutes and lasted for 14.8 hours. Seepage occurred through the shaft and at the cables.

References: (B) (E) (H) (L) (AT) (KX) (KY)

Test:	IZZER		
Date:	07/16/65	Sponsor:	LLNL
Time:	0604 PDT	Depth of Burial:	535 ft
Location:	NTS U9bp	Purpose:	Weapons Related
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: 3.5×10^{-3}

^{133}Xe in curies: 3.0×10^{-4}

^{133m}Xe in curies: 1.5×10^{-4}

^{135}Xe in curies: 3.0×10^{-3}

Release Summary: A drillback release occurred from the ventilation line at 0200 hours on July 17, 1965, and lasted for one hour.

References: (C) (E) (H) (AU) (UY)

Test:	PONGEE		
Date:	07/22/65	Sponsor:	LRL
Time:	0621 PDT	Depth of Burial:	440 ft
Location:	NTS U2ah	Purpose:	Weapons Related
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Test and Drillback

Test Release Activity at R+12 Hours, in Curies: 6.4

Isotopes Identified in the Release: ^{91}Sr , ^{91}Kr , ^{135}I , ^{135}Xe , ^{138}Xe , ^{139}Xe , ^{140}Xe , ^{138}Cs , ^{139}Ba , and ^{140}Ba

Drillback Release Activity at Time of Release, in Curies: 4.2

^{133}Xe in curies: 1.4

$^{133\text{m}}\text{Xe}$ in curies: 4.0×10^{-2}

^{135}Xe in curies: 2.8

Release Summary: A test release occurred from the ground zero area at H+1.4 minutes and lasted for 11.5 minutes.

A drillback release occurred from the ventilation system at 0300 hours on July 24, 1965, and lasted for one hour.

References: (C) (E) (H) (AU) (UX) (V2)

Test:	BRONZE		
Date:	07/23/65	Sponsor:	LASL
Time:	1000 PDT	Depth of Burial:	1,742 ft
Location:	NTS U7f	Purpose:	Weapons Related
Type:	Shaft	Yield:	20 to 200 kt
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: 1.7×10^3

^{133}Xe in curies: 1.7×10^3

^{135}Xe in curies: 2.2

^{131}I in curies: 2.3×10^{-1}

^{133}I in curies: 2.3×10^{-1}

Release Summary: A release from the drilling pipe occurred at 1610 hours on July 29, 1965.

References: (B) (E) (H) (AU) (TU)

Test:	TICKING		
Date:	08/21/65	Sponsor:	LR
Time:	0643 PDT	Depth of Burial:	682 ft
Location:	NTS U9bj	Purpose:	Weapons Related
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: 2.6×10^3

^{133}Xe in curies: 1.4×10^3

$^{133\text{m}}\text{Xe}$ in curies: 6.3×10^1

^{135}Xe in curies: 1.1×10^3

^{131}I in curies: 1.6×10^{-1}

^{132}I in curies: 1.7

^{133}I in curies: 1.3×10^{-1}

Release Summary: A drillback release occurred from the ventilation line at 1400 hours on August 23, 1965, lasting for two hours. A second release occurred from the drilling rig at 0630 hours on August 23, 1965, lasting for 16.25 hours.

References: (C) (E) (H) (AU) (V0)

Test:	CENTAUR		
Date:	08/27/65	Sponsor:	LR
Time:	0651 PDT	Depth of Burial:	564 ft
Location:	NTS U2ak	Purpose:	Weapons Related
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Test and Drillback

Test Release at R+12 Hours, in Curies: 1.1×10^{-1}

Isotopes Identified in the Release: ^{138}Xe and ^{138}Cs

Drillback Release Activity at Time of Release, in Curies: 5.7×10^1

^{133}Xe in curies: 2.0×10^1

$^{133\text{m}}\text{Xe}$ in curies: 9.0×10^{-1}

^{135}Xe in curies: 3.6×10^1

^{131}I in curies:	2.2×10^{-3}
^{132}I in curies:	2.5×10^{-2}
^{133}I in curies:	6.5×10^{-3}

Release Summary: A test release from the surface ground zero area occurred at H+5 minutes and lasted for ten minutes.

A drillback release occurred from the drilling rig at 0420 hours on August 29, 1965, and lasted for 1.5 hours.

References: (C) (E) (H) (AU) (KZ)

Detonation:	SCREAMER (simultaneous with MOA, separate holes)		
Date:	09/01/65	Sponsor:	LASL
Time:	1308 PDT	Depth of Burial:	991 ft
Location:	NTS U3dg	Purpose:	Weapons Effects
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Test

Test Release at R+12 Hours, in Curies: 6.3×10^4

Isotopes Identified in the Release: ^{88}Kr , ^{131}I , ^{133}I , ^{135}I , ^{133}Xe , ^{135}Xe , ^{138}Xe , and ^{138}Cs

Release Summary: A release occurred at H+30 minutes and lasted for 25 hours.

References: (B) (E) (H) (AU) (UF)

Test:	ELKHART		
Date:	09/17/65	Sponsor:	LRL
Time:	0808 PDT	Depth of Burial:	720 ft
Location:	NTS 9bs	Purpose:	Weapons Related
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: 5.6×10^1

^{133}Xe in curies: 4.0×10^1

^{133m}Xe in curies: 1.3

^{135}Xe in curies: 1.5×10^1

Release Summary: A drillback release occurred from the ventilation system at 1300 hours on September 18, 1965, and lasted for 4.75 days.

References: (C) (E) (H) (AU) (LA)

Test:	SEPIA		
Date:	11/12/65	Sponsor:	LASL
Time:	1000 PST	Depth of Burial:	791 ft
Location:	NTS U3en	Purpose:	Weapons Related
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: 4.7×10^{-3}

^{131}I in curies: 1.1×10^{-3}

^{133}I in curies: 3.5×10^{-3}

^{135}I in curies: 1.0×10^{-4}

Release Summary: A drillback release occurred on November 16, 1965.

References: (B) (E) (H) (AU)

Test:	KERMET		
Date:	11/23/65	Sponsor:	LLR
Time:	1017 PST	Depth of Burial:	643 ft
Location:	NTS U2c	Purpose:	Weapons Related
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Test and Drillback

Test Release at R+12 Hours, in Curies: Less than 5.5

Isotopes Identified in the Release: ^{133}Xe , $^{133\text{m}}\text{Xe}$, and ^{135}Xe

Drillback Release Activity at Time of Release, in Curies: 1.8×10^{-1}

^{133}Xe in curies: 9.0

$^{133\text{m}}\text{Xe}$ in curies: 2.0×10^{-1}

^{135}Xe in curies: 9.0

Release Summary: A test release (seepage) occurred from the surface ground zero area beginning at 2100 hours on November 23, 1965, and lasting for 15 hours.

Drillback releases occurred from the ventilation line at 1700 hours on November 24, 1965, lasting for six hours, and from the ventilation line on November 29, 1965, lasting for four hours.

References: (C) (E) (H) (X) (AU) (V1)

Test:	CORDUROY		
Date:	12/03/65	Sponsor:	RLR
Time:	0713 PST	Depth of Burial:	2,236 ft
Location:	NTS U10k	Purpose:	Weapons Related
Type:	Shaft	Yield:	20 to 200 kt
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: 1.2×10^3

^{133}Xe in curies: 1.2×10^3

$^{133\text{m}}\text{Xe}$ in curies: 1.7×10^1

^{135}Xe in curies: 2.8×10^{-1}

Release Summary: A drillback release occurred from the ventilation system at 1400 hours on December 8, 1965, and lasted for 11.9 days.

References: (C) (E) (H) (AU) (LB)

Test:	EMERSON		
Date:	12/16/65	Sponsor:	RLR
Time:	0739 PST	Depth of Burial:	853 ft
Location:	NTS U2al	Purpose:	Weapons Related
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Test and Drillback

Test Release at R+12 Hours, in Curies: Less than 7.5×10^{-2}

Drillback Release Activity at Time of Release, in Curies: 5.7×10^{-1}

^{133}Xe in curies: 5.4×10^{-1}

$^{133\text{m}}\text{Xe}$ in curies: 1.6×10^{-2}

^{135}Xe in curies: 1.7×10^{-2}

Release Summary: A test release from the surface ground zero area occurred at H+7.7 minutes and lasted for one minute.

A drillback release from the ventilation system occurred at 1700 hours on December 19, 1965, and lasted for 2.2 days.

References: (C) (E) (H) (AU) (LC) (MF)

Test: **MAXWELL**

Date:	01/13/66	Sponsor:	LRL
Time:	0737 PST	Depth of Burial:	601 ft
Location:	NTS U9br	Purpose:	Weapons Related
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: 3.4

^{133}Xe in curies: 3.0

$^{133\text{m}}\text{Xe}$ in curies: 7.0×10^{-2}

^{135}Xe in curies: 3.0×10^{-1}

Release Summary: A drillback release occurred from the ventilation system at 0700 hours on January 15, 1966, and lasted for 4.3 days.

References: (C) (E) (H) (AU) (LD)

Test: **SIENNA**

Date:	01/18/66	Sponsor:	LASL
Time:	1035 PST	Depth of Burial:	902 ft
Location:	NTS U3cj	Purpose:	Weapons Related
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: 7.4×10^{-3}

^{131}I in curies: 1.6×10^{-3}

^{133}I in curies: 5.6×10^{-3}

^{135}I in curies: 2.0×10^{-4}

Release Summary: A drillback release occurred at 0900 hours on January 20, 1966. The above activity was noted on an area air sampler.

References: (B) (E) (H) (AU) (UL)

Test:	REO		
Date:	01/22/66	Sponsor:	LLNL
Time:	0717 PST	Depth of Burial:	682 ft
Location:	NTS U10m	Purpose:	Weapons Related
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Test and Drillback

Test Release Activity at R+12 Hours, in Curies: 1.0×10^1

Isotopes Identified in the Release: ^{88}Kr , ^{88}Rb , ^{133}I , ^{133}Xe , ^{135}Xe , ^{138}Xe , and ^{138}Cs

Drillback Release Activity at Time of Release, in Curies: 2.2×10^1

^{133}Xe in curies: 2.1×10^1

$^{133\text{m}}\text{Xe}$ in curies: 6.1×10^{-1}

^{135}Xe in curies: 1.6×10^{-1}

Release Summary: A test release occurred from the cables at H+2 hours and lasted for 15 minutes.

A drillback release occurred from the ventilation system beginning at 0943 hours on January 27, 1966, and lasted for 4.5 hours.

References: (C) (E) (H) (AU) (QA)

Test:	PLAID II		
Date:	02/03/66	Sponsor:	LLNL
Time:	1017 PST	Depth of Burial:	886 ft
Location:	NTS U2r	Purpose:	Weapons Related
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Test and Drillback

Test Release at R+12 Hours, in Curies: 6.5

Isotopes Identified in the Release: ^{138}Xe , ^{139}Xe , ^{138}Cs , and ^{139}Ba

Drillback Release Activity at Time of Release, in Curies: 1.9×10^2

^{133}Xe in curies: 1.8×10^2

$^{133\text{m}}\text{Xe}$ in curies: 8.0×10^{-1}

^{135}Xe in curies: 5.1

^{131}I in curies: 1.9×10^{-2}

^{133}I in curies: 7.6×10^{-2}

Release Summary: A test release from the surface ground zero area occurred at H+20 minutes and lasted for 29 minutes.

Drillback releases occurred from the surface ground zero area at 1445 hours on February 5, 1966, lasting for 3.1 days, and from the ventilation system at 2220 hours on February 5, 1966, lasting for 2.2 days.

References: (C) (E) (H) (AU) (LE) (MG)

Test:	REX		
Date:	02/24/66	Sponsor:	LRL
Time:	0755 PST	Depth of Burial:	2,204 ft
Location:	NTS UE20h	Purpose:	Weapons Related
Type:	Shaft	Yield:	19 kt
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: 3.1×10^2

^{133}Xe in curies: 3.0×10^2

$^{133\text{m}}\text{Xe}$ in curies: 7.1

^{135}Xe in curies: 4.6×10^{-1}

Release Summary: A drillback release occurred from the ventilation system at 0150 hours on March 2, 1966, and lasted for five days.

References: (C) (E) (H) (AU) (JJ)

Test:	RED HOT		
Date:	03/05/66	Sponsor:	DoD/LASL
Time:	1015 PST	Depth of Burial:	1,329 ft
Location:	NTS U12g.06	Purpose:	Weapons Effects
Type:	Tunnel	Yield:	Less than 20 kt
Release Detected:	Offsite	Type of Release:	Uncontrolled

Uncontrolled Release at R+12 Hours, in Curies: 1.0×10^6

Isotopes Identified in the Release: krypton, xenons, ^{131}I , ^{133}I , and ^{135}I

Cloud Direction: Northeasterly

Maximum Activity Detected in Air Offsite: 0.69 picocuries of gross beta activity per cubic meter of air at Elko, Nevada

Maximum Gamma Exposure Rate Detected Offsite: No radiation intensities above background were measured.

Maximum Iodine Level Detected Offsite: 19 picocuries of ^{131}I per cubic meter of air, 81 picocuries of ^{133}I per cubic meter of air at Lathrop Wells, Nevada, and 80 picocuries of ^{135}I per cubic meter of air at 18 miles west of Clark Station, Nevada, on Highway 6

Maximum Distance Radiation Detected Offsite: Ground level readings were not above background radiation levels. However, a cloud tracking mission detected activity in the vicinity of Dubuque, Iowa.

Release Summary: Two releases occurred as follows:

1. An uncontrolled release occurred from H+7 minutes until H+110 minutes. Seepage was observed coming from the portal immediately after zero time. At H+7 minutes, the tunnel ventilation system was turned on and continued to operate until H+110 minutes when it was apparent that the filter system was nonfunctional. The ventilation system was then turned off.
2. An uncontrolled release occurred at H+2 hours and continued seeping from the tunnel portal until H+20 hours when the majority of the release was over. Seepage from the portal continued for several days but did not significantly contribute to the magnitude of the release. The released effluent was predominantly noble gases, but approximately 2,000 curies of ^{135}I , 500 curies of ^{133}I , and 20 curies of ^{131}I were also observed.

References: (B) (D) (E) (H) (L) (P) (R) (Z) (AU) (EH) (EY) (HD) (NY) (PA)

Detonation: **FINFOOT** (simultaneous with CINNAMON, separate holes)

Date:	03/07/66	Sponsor:	LASL
Time:	1041 PST	Depth of Burial:	640 ft
Location:	NTS U3du	Purpose:	Weapons Related
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Test

Test Release at R+12 Hours, in Curies: 6.0×10^{-5}

Release Summary: A test release occurred at H+2 minutes and lasted for approximately ten minutes.

References: (B) (E) (H) (J) (AU)

Test:	CLYMER		
Date:	03/12/66	Sponsor:	LLNL
Time:	1004 PST	Depth of Burial:	1,306 ft
Location:	NTS U9ce	Purpose:	Weapons Related
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: 4.5×10^2

^{133}Xe in curies: 3.5×10^2

$^{133\text{m}}\text{Xe}$ in curies: 8.0

^{135}Xe in curies: 9.3×10^1

Release Summary: Drillback releases occurred from the ventilation system at 1900 hours on March 13, 1966, lasting for 2.6 days, and at 1405 hours on March 23, 1966, lasting for six hours.

References: (C) (E) (H) (AU) (LF)

Test:	TEMPLAR		
Date:	03/24/66	Sponsor:	LLNL
Time:	0655 PST	Depth of Burial:	495 ft
Location:	NTS U9bt	Purpose:	Plowshare
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at R+12 Hours*, in Curies: 7.5×10^{-2}

^{133}Xe in curies: 2.4×10^{-2}

$^{133\text{m}}\text{Xe}$ in curies: 1.0×10^{-3}

^{135}Xe in curies: 5.0×10^{-2}

Release Summary: Two releases occurred from the ventilation line.

References: (C) (E) (H) (AU) (LG)

*Drillback release activity at the time of release is not available.

Test:	STUTZ		
Date:	04/06/66	Sponsor:	LLNL
Time:	0557 PST	Depth of Burial:	739 ft
Location:	NTS U2ca	Purpose:	Weapons Related
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: 1.1

^{133}Xe in curies: 7.0×10^{-1}

$^{133\text{m}}\text{Xe}$ in curies: 2.8×10^{-2}

^{135}Xe in curies: 3.9×10^{-1}

Release Summary: A drillback release occurred from the ventilation system at 1100 hours on April 8, 1966, and lasted for 2.4 days.

References: (C) (E) (H) (AU) (LH)

Test:	DURYEA		
Date:	04/14/66	Sponsor:	LLNL
Time:	0613 PST	Depth of Burial:	1,786 ft
Location:	NTS U20a	Purpose:	Weapons Related
Type:	Shaft	Yield:	70 kt
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: 1.7

^{133}Xe in curies: 1.6

$^{133\text{m}}\text{Xe}$ in curies: 4.8×10^{-2}

^{135}Xe in curies: 2.5×10^{-2}

Release Summary: A drillback release occurred from the ventilation system at 1935 hours on April 17, 1966, and lasted for 1.5 days.

References: (C) (E) (H) (CE) (AU) (LJ)

Test:	FENTON		
Date:	04/23/66	Sponsor:	LLNL
Time:	0655 PST	Depth of Burial:	549 ft
Location:	NTS U2m	Purpose:	Weapons Related
Type:	Shaft	Yield:	1.4 kt
Release Detected:	Offsite	Type of Release:	Test and Drillback

Test Release at R+12 Hours, in Curies: 1.7×10^4

Isotopes Identified in the Release: ^{131}I , ^{133}I , ^{135}I , ^{133}Xe , and ^{135}Xe

Maximum Activity Detected in Air Offsite: Fresh fission products were not detected.

Maximum Gamma Exposure Rate Detected Offsite: No radiation intensities were detected above background levels.

Maximum Iodine Level Detected Offsite: No iodines were detected in any samples.

Maximum Distance Radiation Detected Offsite: No radioactivity above background levels was detected by ground monitoring instruments. However, radioactivity was detected by aerial monitoring at Baker, California.

Drillback Release Activity at Time of Release, in Curies: 1.7×10^3

^{133}Xe in curies: 8.3×10^2

$^{133\text{m}}\text{Xe}$ in curies: 5.9

^{135}Xe in curies: 8.8×10^2

^{131}I in curies: 5.6×10^{-2}

^{133}I in curies: 2.4

^{135}I in curies: 7.3

Release Summary: A test release occurred from the access shaft at H+1.5 minutes, lasting for three minutes.

Drillback releases occurred from the ventilation line at 1400 hours on April 24, 1966, lasting for 24.4 days and from the crater at 1200 hours on April 23, 1966, lasting for 4.8 days.

References: (C) (E) (H) (S) (Z) (AU) (EV) (G0) (J0)

Test:	PIN STRIPE		
Date:	04/25/66	Sponsor:	DoD/LASL
Time:	1138 PDT	Depth of Burial:	971 ft
Location:	NTS U11b	Purpose:	Weapons Effects
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Offsite	Type of Release:	Test

Test Release at R+12 Hours, in Curies: 2.1×10^5

Isotopes Identified in the Release: kryptons, xenons, ^{131}I , ^{133}I , and ^{135}I

Cloud Direction: Northeasterly; winds shifted 180 degrees by April 27 and radiation was detected as far as Indio, California

Maximum Activity Detected in Air Offsite: 25,000 picocuries of gross beta activity per cubic meter of air at Ash Springs, Nevada (populated site); highest concentration in an unpopulated site, 50,000 picocuries of gross beta activity per cubic meter of air at 6.5 miles west of Hancock Summit, Nevada

Maximum Gamma Exposure Rate Detected Offsite: 8.0 mR/h at 18 miles northeast of Groom Lake, Nevada (unpopulated); 1.5 mR/h at Hiko, Nevada (populated)

Maximum Iodine Level Detected Offsite: 38,000 picocuries of ^{135}I per cubic meter of air in Ash Springs, Nevada (populated site); highest concentration at an unpopulated site, 94,000 picocuries of ^{135}I per cubic meter of air at 18 miles northeast of Groom Lake, Nevada; highest concentration of ^{131}I in a domestic water supply, 3,900 picocuries per liter from an open tank at Hiko, Nevada; highest concentration of ^{131}I in a single milk sample, 4,800 picocuries per liter, and highest concentration of ^{133}I , 12,000 picocuries per liter at Schofield Dairy at Hiko, Nevada

Maximum Distance Radiation Detected Offsite: 0.05 mR/h at Pioche, Nevada

Release Summary: Test releases from a fissure near surface ground zero occurred at H+1 minute and at H+7 hours. The releases lasted for 3.5 minutes and 14 hours, respectively. Gross fission products were released as a result of this venting.

References: (B) (D) (E) (H) (L) (M) (P) (R) (Z) (AU) (DL) (DM) (E2) (LK) (LL) (PB)

Test:	TRAVELER		
Date:	05/04/66	Sponsor:	LRL
Time:	0632 PDT	Depth of Burial:	646 ft
Location:	NTS U2cd	Purpose:	Weapons Related
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: 1.7×10^2

^{133}Xe in curies: 1.7×10^2

$^{133\text{m}}\text{Xe}$ in curies: 6.3×10^{-1}

^{135}Xe in curies: 2.8

Release Summary: A drillback release occurred from the ventilation system at 1315 on May 6, 1966, and lasted for 2.1 days.

References: (C) (E) (H) (AU) (LM)

Test: TAPESTRY

Date:	05/12/66	Sponsor:	LLNL
Time:	1237 PDT	Depth of Burial:	811 ft
Location:	NTS U2an	Purpose:	Weapons Related
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Test and Drillback

Test Release at R+12 Hours, in Curies: 6.2×10^3

Drillback Release Activity at Time of Release, in Curies: 2.4×10^3

^{133}Xe in curies: 1.5×10^3

$^{133\text{m}}\text{Xe}$ in curies: 3.2×10^1

^{135}Xe in curies: 8.5×10^2

Release Summary: A test release from the surface ground zero area occurred at approximately H+1.1 hours and lasted for 57.3 hours.

A drillback release from the ventilation line occurred at 1600 hours on May 13, 1966, and lasted for 49.5 days.

References: (C) (E) (H) (P) (AU) (LN)

Test: DUMONT

Date:	05/19/66	Sponsor:	LLNL
Time:	0656 PDT	Depth of Burial:	2,201 ft
Location:	NTS U2t	Purpose:	Weapons Related
Type:	Shaft	Yield:	20 to 200 kt
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: 3.5×10^1

^{133}Xe in curies: 3.5×10^1

$^{133\text{m}}\text{Xe}$ in curies: 5.4×10^{-1}

Release Summary: A drillback release occurred from the ventilation line at 0630 hours on May 26, 1966, and lasted for 13.2 days.

References: (C) (E) (H) (AU) (LO)

Test: PILE DRIVER

Date:	06/02/66	Sponsor:	DoD/LASL
Time:	0830 PDT	Depth of Burial:	1,519 ft
Location:	NTS U15a.01	Purpose:	Weapons Effects
Type:	Tunnel	Yield:	62 kt
Release Detected:	Onsite Only	Type of Release:	Uncontrolled

Uncontrolled Release at R+12 Hours, in Curies: 3.7×10^4

Isotopes Identified in the Release: ^{135}Xe

Release Summary: An uncontrolled test release occurred as the result of seepage from the surface ground zero area at H+12 hours and lasted for 11 hours.

References: (B) (E) (H) (L) (P) (R) (AU) (LP)

Test: DOUBLE PLAY

Date:	06/15/66	Sponsor:	DoD/LRL
Time:	1000 PDT	Depth of Burial:	1,050 ft
Location:	NTS U16a.03	Purpose:	Weapons Effects
Type:	Tunnel	Yield:	Less than 20 kt
Release Detected:	Offsite (Uncontrolled Only)	Type of Release:	Controlled, Uncontrolled and Drillback

Controlled Release Activity at Time of Release, in Curies: 4.0×10^4

Controlled Release Activity at R+12 Hours, in Curies: 2.6×10^4

Uncontrolled Release at R+12 Hours, in Curies: 8.0×10^5

Isotopes Identified in the Release: Noble gases and radioiodines

Cloud Direction: Northeasterly for about 200 miles

Maximum Activity Detected in Air Offsite: 0.83 picocuries of gross beta activity per cubic meter of air at Hiko, Nevada

Maximum Gamma Exposure Rate Detected Offsite: No radiation intensities above normal background levels were measured.

Maximum Iodine Level Detected Offsite: 1.9 picocuries of ^{131}I per cubic meter of air, 1.2 picocuries of ^{133}I per cubic meter of air, and 5.6 picocuries of ^{135}I per cubic meter of air at Hiko, Nevada

Maximum Distance Radiation Detected Offsite: No radiation readings above background levels were measured.

Drillback Release Activity at Time of Release, in Curies: 9.1×10^{-1}

^{133}Xe in curies: 9.1×10^{-1}

Release Summary: Four test releases occurred as follows:

1. Seepage from cable holes occurred at H+12 minutes until H+28 hours. Primarily noble gases were released.
2. Leakage from the portal occurred at H+5 minutes until H+50 hours. Noble gases and radioiodines were released.
3. A controlled ventilation of the tunnel complex with effluent passing through the filter system occurred at H+50 hours until H+51.6 hours.
4. A controlled ventilation of the tunnel complex was restarted at H+53.6 hours because of a buildup of explosive gases, and ventilation continued until the tunnel was cleared.

A drillback release from the vent line occurred at 1800 hours on August 2, 1966, and lasted for four days.

References: (C) (D) (E) (H) (L) (P) (R) (X) (Z) (AU) (EI) (EJ) (HE) (LR)

Test: KANKAKEE

Date:	06/15/66	Sponsor:	LLNL
Time:	1102 PDT	Depth of Burial:	1,494 ft
Location:	NTS U10p	Purpose:	Weapons Related
Type:	Shaft	Yield:	20 to 200 kt
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: 1.6×10^{-2}

^{133}Xe in curies: 1.5×10^{-2}

^{133m}Xe in curies: 4.2

^{135}Xe in curies: 3.6

Release Summary: A drillback release occurred from the ventilation line at 0730 hours on June 17, 1966, and lasted for five days.

References: (C) (E) (H) (AU) (LQ)

Test: VULCAN

Date:	06/25/66	Sponsor:	LRL
Time:	1013 PDT	Depth of Burial:	1,057 ft
Location:	NTS U2bd	Purpose:	Plowshare
Type:	Shaft	Yield:	25 kt
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: 2.5×10^2

^{133}Xe in curies: 6.3×10^1

$^{133\text{m}}\text{Xe}$ in curies: 2.9

^{135}Xe in curies: 1.8×10^2

Release Summary: A drillback release occurred from the ventilation line at 1100 hours June 27, 1966, and lasted for 2.4 days.

References: (C) (E) (H) (AU) (LS)

Test: SAXON

Date:	07/28/66	Sponsor:	LRL
Time:	0833 PDT	Depth of Burial:	502 ft
Location:	NTS U2cc	Purpose:	Plowshare
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: 5.0×10^{-1}

^{133}Xe in curies: 3.8×10^{-1}

$^{133\text{m}}\text{Xe}$ in curies: 1.2×10^{-2}

^{135}Xe in curies: 1.1×10^{-1}

Release Summary: A drillback release occurred from the ventilation line at 0045 hours on July 29, 1966, and lasted for 3.1 days.

References: (C) (E) (H) (AU) (LT)

Test:	ROVENA		
Date:	08/10/66	Sponsor:	LLNL
Time:	0616 PDT	Depth of Burial:	641 ft
Location:	NTS U10s	Purpose:	Weapons Related
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: 1.9

^{133}Xe in curies: 1.0

$^{133\text{m}}\text{Xe}$ in curies: 4.1×10^{-2}

^{135}Xe in curies: 8.3×10^{-1}

Release Summary: A drillback release occurred from the ventilation line at 1500 hours on August 12, 1966, and lasted for 20 hours.

References: (C) (E) (H) (AV) (LU) (LV)

Test:	DERRINGER		
Date:	09/12/66	Sponsor:	DoD/SC/LASL
Time:	0830 PDT	Depth of Burial:	837 ft
Location:	NTS U5i	Purpose:	Weapons Effects
Type:	Shaft	Yield:	7.8 kt
Release Detected:	Offsite	Type of Release:	Test

Test Release at R+12 Hours, in Curies: 1.2×10^4

Isotopes Identified in the Release: ^{131}I , ^{133}I , ^{135}I , kryptons, and xenons

Cloud Direction: Northeasterly for about 150 miles until the cloud was undetectable

Maximum Activity Detected in Air Offsite: No fresh fission products were detected.

Maximum Gamma Exposure Rate Detected Offsite: 0.003 mR/h at Hancock Summit, Nevada, and ten miles southeast of Coyote Summit, Nevada

Maximum Iodine Level Detected Offsite: No iodine was detected.

Maximum Distance Radiation Detected Offsite: 0.003 mR/h at Hancock Summit, Nevada, and at ten miles southeast of Coyote Summit, Nevada

Release Summary: Test releases from the shaft area occurred at H+1 minute and at H+50 minutes and lasted for 14 minutes and 47.1 hours, respectively. The effluent contained

noble gases and radioiodines (152 curies of ^{135}I , 41 curies of ^{133}I , and 1.5 curies of ^{131}I at the time of release).

References: (B) (D) (E) (H) (L) (M) (P) (R) (Z) (AV) (FD) (HF) (HG) (LW)

Test: NEWARK

Date:	09/29/66	Sponsor:	LRL
Time:	0745 PDT	Depth of Burial:	750 ft
Location:	NTS U10u	Purpose:	Weapons Related
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: 2.9×10^2

^{133}Xe in curies: 1.6×10^2

$^{133\text{m}}\text{Xe}$ in curies: 7.0

^{135}Xe in curies: 1.2×10^2

Release Summary: A drillback release occurred from the ventilation line at 1850 hours on October 1, 1966, and lasted for 15 minutes.

References: (C) (E) (H) (AV) (LX)

Test: SIMMS

Date:	11/05/66	Sponsor:	LRL
Time:	0645 PST	Depth of Burial:	650 ft
Location:	NTS U10w	Purpose:	Plowshare
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: 1.1×10^1

^{133}Xe in curies: 8.5

$^{133\text{m}}\text{Xe}$ in curies: 4.0×10^{-1}

^{135}Xe in curies: 1.9

^{131}I in curies: 9.0×10^{-3}

^{133}I in curies: 1.8×10^{-2}

Release Summary: Drillback releases occurred from the ventilation line at 1725 hours on November 6, 1966, lasting for 46 hours, and from the drilling rig at 0705 hours on November 7, 1966, lasting for 47.7 hours.

References: (C) (E) (H) (AU) (LY)

Test:	AJAX		
Date:	11/11/66	Sponsor:	LRL
Time:	0400 PST	Depth of Burial:	782 ft
Location:	NTS U9al	Purpose:	Weapons Related
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Test and Drillback

Test Release at R+12 Hours, in Curies: 4.4×10^{-1}

Drillback Release Activity at Time of Release, in Curies: 9.0×10^{-1}

^{133}Xe in curies: 7.0×10^{-1}

^{135}Xe in curies: 2.0×10^{-1}

Release Summary: Test releases occurred from the surface ground zero area at H+12 minutes, lasting for four minutes, and from cables at the Red Shack area at H+33 minutes, lasting for four minutes.

A drillback release from the ventilation line occurred at 0240 hours on November 15, 1966, and lasted for five minutes.

References: (C) (E) (H) (AV) (LZ)

Test:	CERISE		
Date:	11/18/66	Sponsor:	LASL
Time:	0702 PST	Depth of Burial:	692 ft
Location:	NTS U3eu	Purpose:	Weapons Related
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Test

Test Release at R+12 Hours, in Curies: 0

Isotopes Identified in the Release: xenons, kryptons, and ^{88}Rb

Release Summary: No test release was detectable, but an air sample taken inside the surface ground zero casing showed detectable xenon, krypton, and rubidium-88.

References: (B) (E) (H) (AV) (TX)

Test:	VIGIL		
Date:	11/22/66	Sponsor:	LRRL
Time:	0700 PST	Depth of Burial:	299 ft
Location:	NTS U10ad	Purpose:	Safety Experiment
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Test

Test Release Activity at R+12 Hours, in Curies: 1.4×10^{-3}

Release Summary: A test release occurred from the surface ground zero area at H+4 minutes and lasted for six minutes.

References: (C) (E) (H) (AV) (V3)

Test:	SIDECAR		
Date:	12/13/66	Sponsor:	LASL
Time:	0950 PST	Depth of Burial:	788 ft
Location:	NTS U3ez	Purpose:	Weapons Related
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Test

Test Release Activity at R+12 Hours, in Curies: 4.1×10^{-2}

Isotopes Identified in the Release: ^{131}I , ^{132}I , ^{133}I , and ^{135}I

Release Summary: All activity from this release was attributed to the catcher pull.

References: (B) (E) (H) (AV) (UK)

Test:	NEW POINT		
Date:	12/13/66	Sponsor:	DoD/LRL
Time:	1300 PST	Depth of Burial:	784 ft
Location:	NTS U11c	Purpose:	Weapons Effects
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Test

Test Release at R+12 Hours, in Curies: 3.0

Release Summary: Seepage from the surface ground zero area occurred at H+7 hours through H+9 hours. Primarily noble gases were released.

References: (C) (E) (H) (L) (X) (L0) (AV)

Test:	NASH		
Date:	01/19/67	Sponsor:	LLNL
Time:	0845 PST	Depth of Burial:	1,194 ft
Location:	NTS U2ce	Purpose:	Weapons Related
Type:	Shaft	Yield:	39 kt
Release Detected:	Offsite	Type of Release:	Test

Test Release at R+12 Hours, in Curies: 6.9×10^4

Isotopes Identified in the Release: ^{87}Kr , ^{88}Kr , ^{131}I , ^{133}I , ^{135}I , ^{133}Xe , and ^{135}Xe

Cloud Direction: Southwesterly; within a few miles aircraft could not detect the cloud

Maximum Activity Detected in Air Offsite: 2.6 picocuries of gross beta activity per cubic meter of air at Nyala, Nevada*

Maximum Gamma Exposure Rate Detected Offsite: 0.14 mR/h at 21 miles west of the Mercury turnoff on Highway 95 (Nevada)*

Maximum Iodine Level Detected Offsite: 1.2 picocuries of ^{131}I per cubic meter of air at Clark Station, Nevada*

Maximum Distance Radiation Detected Offsite: 0.01 mR/h at the Diablo Maintenance Station, Nevada (exposure rate recorder measurement)

Release Summary: A test release from the surface ground zero area of the crater began at H+9.25 hours on January 19, 1967, and lasted for 41 hours.

References: (C) (D) (E) (H) (P) (Z) (AV) (DN) (HH) (M0)

*Data recorded was attributed to radioactive debris from an atmospheric Chinese nuclear test conducted on December 27, 1966.

Test:	RIVET II		
Date:	01/26/67	Sponsor:	LLNL
Time:	0830 PST	Depth of Burial:	646 ft
Location:	NTS U10z	Purpose:	Weapons Related
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Test

Test Release Activity at R+12 Hours, in Curies: 5.8×10^{-2}

Release Summary: A test release occurred from the surface ground zero area at zero time and lasted for 20 minutes.

References: (C) (E) (H) (AV) (UE)

Test: RIVET III

Date:	03/02/67	Sponsor:	LRL
Time:	0700 PST	Depth of Burial:	890 ft
Location:	NTS U10y	Purpose:	Weapons Related
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release: Trace

 iodines: trace

Release Summary: A drillback release occurred from the ventilation system at 1535 hours on March 7, 1967, and lasted for 63 hours.

References: (C) (E) (H) (X) (AV) (MI)

Test: MUSHROOM

Date:	03/03/67	Sponsor:	LASL
Time:	0719 PST	Depth of Burial:	587 ft
Location:	NTS U3ef	Purpose:	Weapons Related
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Test

Test Release Activity at R+12 Hours, in Curies: 3.8×10^{-1}

Isotopes Identified in the Release: ^{131}I , ^{132}I , ^{133}I , ^{135}I , and ^{135}Xe

Release Summary: All activity from this release was attributed to the catcher pull.

References: (B) (E) (H) (AV) (V4)

Test:	OAKLAND		
Date:	04/04/67	Sponsor:	LR
Time:	0620 PST	Depth of Burial:	542 ft
Location:	NTS U2bi	Purpose:	Weapons Related
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: 1.0×10^2

^{133}Xe in curies: 2.2×10^1

$^{133\text{m}}\text{Xe}$ in curies: 1.1

^{135}Xe in curies: 8.1×10^1

Release Summary: Nine intermittent drillback releases occurred from the ventilation line system beginning at 1510 hours on April 5, 1967, and lasting for a total of approximately 4 hours over a 30-hour period.

References: (C) (E) (H) (AV) (V5)

Test:	HEILMAN		
Date:	04/06/67	Sponsor:	LR
Time:	0700 PST	Depth of Burial:	499 ft
Location:	NTS U2cg	Purpose:	Weapons Related
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Test and Drillback

Test Release Activity at R+12 Hours, in Curies: 3.1×10^{-2}

Drillback Release Activity at Time of Release, in Curies: 8.3

^{133}Xe in curies: 8.1

$^{133\text{m}}\text{Xe}$ in curies: 1.5×10^{-1}

^{135}Xe in curies: 1.2×10^{-3}

Release Summary: A test release occurred from the surface ground zero area at zero time and lasted for 41 minutes.

A drillback release occurred from the ventilation system at 1735 hours on April 14, 1967, and lasted for 45 minutes.

References: (C) (E) (H) (X) (AV) (V6)

Test:	COMMODORE		
Date:	05/20/67	Sponsor:	LRL
Time:	0800 PDT	Depth of Burial:	2,449 ft
Location:	NTS U2am	Purpose:	Weapons Related
Type:	Shaft	Yield:	250 kt
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: Less than 1.0

iodines: trace

Release Summary: A drillback release occurred from the drilling rig cellar at 1705 hours on May 28, 1967, and lasted for 70 minutes.

References: (C) (E) (H) (AV) (M2)

Test:	KNICKERBOCKER		
Date:	05/26/67	Sponsor:	LRL
Time:	0800 PDT	Depth of Burial:	2,069 ft
Location:	NTS U20d	Purpose:	Weapons Related
Type:	Shaft	Yield:	76 kt
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: 1.1×10^2

^{133}Xe in curies: 1.1×10^2

$^{133\text{m}}\text{Xe}$ in curies: 1.8×10^{-1}

Release Summary: A drillback release occurred from the ventilation system at 0115 hours on June 16, 1967, and lasted for 5.6 days.

References: (C) (E) (H) (AV) (M3)

Test:	SWITCH		
Date:	06/22/67	Sponsor:	LRL
Time:	0610 PDT	Depth of Burial:	990 ft
Location:	NTS U9bv	Purpose:	Plowshare
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: Less than 1.0

^{133}Xe in curies: less than 1.0
Iodines: trace

Release Summary: A drillback release occurred from the drilling rig cellar at 0725 hours on June 30, 1967, and lasted for 8.6 hours.

References: (C) (E) (H) (AV) (M4)

Test:	MIDI MIST		
Date:	06/26/67	Sponsor:	DoD/LRL
Time:	0900 PDT	Depth of Burial:	1,240 ft
Location:	NTS U12n.02	Purpose:	Weapons Effects
Type:	Tunnel	Yield:	Less than 20 kt
Release Detected:	Offsite (Controlled Only)	Type of Release:	Controlled and Drillback

Controlled Release Activity at Time of Release, in Curies: 4.5×10^3

Controlled Release Activity at R+12 Release, in Curies: 1.3×10^3

Isotopes Identified in the Release: ^{85}Kr , ^{88}Kr , ^{88}Rb , ^{131}I , ^{133}I , ^{135}I , ^{133}Xe , and ^{135}Xe

Cloud Direction: Northerly

Maximum Activity Detected in Air Offsite: No fresh fission products were detected.

Maximum Gamma Exposure Rate Detected Offsite: No radiation intensities were detected above background levels.

Maximum Iodine Level Detected Offsite: No iodines were detected.

Maximum Distance Radiation Detected Offsite: Northerly, toward the east side of the crest of the Belted Range, just off the NTS

Drillback Release Activity at Time of Release, in Curies: 1.8×10^1

^{133}Xe in curies: 1.8×10^1

^{133m}Xe in curies: 1.7×10^{-2}

Release Summary: A controlled, filtered ventilation of the tunnel complex occurred from H+4.67 hours until H+24 hours. Radioactivity was detected off the NTS by aircraft only.

A drillback release from the ventilation line occurred at 0220 hours on July 22, 1967, and lasted for about one hour.

References: (C) (E) (H) (L) (P) (X) (AV) (EK) (HI) (HJ) (M5)

Test:	NUMBER		
Date:	06/29/67	Sponsor:	LASL
Time:	0425 PDT	Depth of Burial:	1,017 ft
Location:	NTS U3em	Purpose:	Weapons Effects
Type:	Shaft	Yield:	10 kt
Release Detected:	Offsite	Type of Release:	Test

Test Release at R+12 Hours, in Curies: 2.6×10^4

Isotopes Identified in the Release: ^{131}I , ^{133}I , ^{135}I , ^{133}Xe , and ^{135}Xe

Cloud Direction: Southwesterly; tracked by aircraft for 90 to 100 miles where it became undetectable

Maximum Activity Detected in Air Offsite: 0.25 picocuries of gross beta activity per cubic meter of air at 10 miles east of Lathrop Wells, Nevada

Maximum Gamma Exposure Rate Detected Offsite: 0.7 mR/h at the junction of Highway 95 and State Road 16 (Ash Meadows, Nevada turnoff)

Maximum Iodine Level Detected Offsite: 80 picocuries of ^{135}I per cubic meter of air and 8.0 picocuries of ^{133}I per cubic meter of air 10 miles east of Lathrop Wells, Nevada

Maximum Distance Radiation Detected Offsite: 0.03 to 0.1 mR/h at Death Valley Junction and Shoshone, California

Release Summary: A test release from the LOS pipe occurred at H+17 minutes and lasted for six days.

References: (B) (D) (E) (H) (P) (Z) (AV) (HK) (J3)

Test:	STANLEY		
Date:	07/27/67	Sponsor:	LRL
Time:	0600 PDT	Depth of Burial:	1,587 ft
Location:	NTS U10q	Purpose:	Weapons Related
Type:	Shaft	Yield:	20 to 200 kt
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: 3.7×10^1

^{133}Xe in curies: 3.5×10^1

$^{133\text{m}}\text{Xe}$ in curies: 1.1

^{135}Xe in curies: 5.3×10^{-1}

Release Summary: A drillback release occurred from the ventilation line at 2125 hours on July 31, 1967, and lasted for 2.7 days.

References: (C) (E) (H) (AW) (M6)

Test:	WASHER		
Date:	08/10/67	Sponsor:	LLNL
Time:	0710 PDT	Depth of Burial:	1,536 ft
Location:	NTS U10r	Purpose:	Weapons Related
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: 4.7×10^{-1}

^{133}Xe in curies: 3.6×10^{-1}

$^{133\text{m}}\text{Xe}$ in curies: 1.5×10^{-2}

^{135}Xe in curies: 9.2×10^{-2}

Release Summary: A drillback release occurred from the ventilation line at 0613 hours on August 13, 1967, and lasted for ten minutes.

References: (C) (E) (H) (AW) (M7)

Test:	LEXINGTON		
Date:	08/24/67	Sponsor:	LLNL
Time:	0630 PDT	Depth of Burial:	741 ft
Location:	NTS U2bm	Purpose:	Weapons Related
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Gas Sampling and Drillback

Gas Sampling Release Activity at Time of Release, in Curies: 1.1×10^3

Isotopes Identified in the Release: ^{88}Kr and ^{135}Xe

Drillback Release Activity at Time of Release, in Curies: 1.3×10^1

^{133}Xe in curies: 1.8

$^{133\text{m}}\text{Xe}$ in curies: 4.4×10^{-2}

^{135}Xe in curies: 1.2

other, in curies: 1.0×10^1

Release Summary: A release occurred during postshot gas sampling operations between 0845 hours and 1300 hours on August 24, 1967.

A drillback release occurred from the ventilation line at 1737 hours on August 25, 1967, and lasted for 22 minutes. A second release occurred from the "blooie" line (a hose used in the drilling circulation system), accounting for 10 curies of the total release.

References: (C) (E) (H) (X) (AW) (QB)

Test:	DOOR MIST		
Date:	08/31/67	Sponsor:	DoD/LASL
Time:	0930 PDT	Depth of Burial:	1,463 ft
Location:	NTS U12g.07	Purpose:	Weapons Effects
Type:	Tunnel	Yield:	Less than 20 kt
Release Detected:	Offsite	Type of Release:	Controlled and Uncontrolled

Controlled Release Activity at Time of Release, in Curies: 6.9×10^5

Controlled Release Activity at R+12, in Curies: 3.5×10^5

Isotopes Detected in Release: ^{103}Ru , ^{106}Ru / ^{106}Rh , ^{131}I , ^{133}I , ^{135}I , and ^{135}Xe

Uncontrolled Release at R+12 Hours, in Curies: 5.0×10^4

Isotopes Identified in the Release: ^{103}Ru , ^{106}Ru / ^{106}Rh , ^{131}I , ^{133}I , and ^{135}Xe

Cloud Direction: Northerly; tracked by aircraft for about 60 miles after which the cloud became undetectable

Maximum Activity Detected in Air Offsite: 0.08 picocuries of gross beta activity per cubic meter of air at Diablo, Nevada

Maximum Gamma Exposure Rate Detected Offsite: 0.01 mR/h at Diablo, Nevada

Maximum Iodine Level Detected Offsite: 2 picocuries of ^{133}I per cubic meter of air and 2.3 picocuries of ^{135}I per cubic meter of air at Diablo, Nevada

Maximum Distance Radiation Detected Offsite: 0.003 mR/h at Clark Station, Nevada

Release Summary: Test releases occurred as follows:

1. Seepage occurred from H+0.5 until H+24 hours through cables to the cable splice building on the mesa. Release to the atmosphere (primarily noble gases) was noted from the cable splice building.
2. Releases from the tunnel portal were from H+1.5 until H+3.5 hours and from H+6.2 until H+8 hours. These releases consisted primarily of the volatile fraction of gross fission products (noble gases, iodines, and rutheniums).

3. Releases during controlled, filtered ventilation of the tunnel complex occurred from H+3.5 until H+5.6 hours and from H+8 until H+72 hours. Effluent consisted of primarily noble gases with small quantities of ^{135}I , ^{133}I , ^{131}I , ^{103}Ru , and $^{106}\text{Ru}/^{106}\text{Rh}$.

References: (B) (D) (E) (H) (K) (L) (P) (Z) (AW) (EL) (EM) (HL) (HM) (M8) (M9)

Test:	YARD		
Date:	09/07/67	Sponsor:	LRL
Time:	0645 PDT	Depth of Burial:	1,708 ft
Location:	NTS U10af	Purpose:	Weapons Related
Type:	Shaft	Yield:	20 to 200 kt
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: 2.9×10^{-1}

^{133}Xe in curies: 1.9×10^{-1}

$^{133\text{m}}\text{Xe}$ in curies: 8.2×10^{-3}

^{135}Xe in curies: 8.9×10^{-2}

Release Summary: Drillback releases occurred from the ventilation line at 2220 hours on September 9, 1967, lasting for two minutes, and at 0135 hours on September 10, 1967, lasting for three minutes.

References: (C) (E) (H) (AW) (L1)

Test:	GILROY		
Date:	09/15/67	Sponsor:	LASL
Time:	1030 PDT	Depth of Burial:	787 ft
Location:	NTS U3ex	Purpose:	Weapons Related
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release: Trace

iodines: trace

Release Summary: A predrillback release began at 0840 hours on October 4, 1967. Traces of iodine were noted during the cable cutting. A drillback release occurred at 2125 hours on October 8, 1967.

References: (B) (E) (H) (AW) (V7)

Test:	MARVEL		
Date:	09/21/67	Sponsor:	LRL
Time:	1345 PDT	Depth of Burial:	572 ft
Location:	NTS U10dS1	Purpose:	Plowshare
Type:	Shaft	Yield:	2.2 kt
Release Detected:	Onsite Only	Type of Release:	Test and Drillback

Test Release at R+12 Hours, in Curies: 2.7×10^1

Isotopes Identified in the Release: ^{87}Kr , ^{88}Kr , ^{88}Rb , ^{133}I , ^{135}I , and ^{135}Xe

Drillback Release Activity at Time of Release, in Curies: 1.0

Release Summary: A test release from Cable Hole No. 5 occurred at 1850 hours on September 21, 1967, and lasted for 3.8 hours.

A drillback release from the drilling mud "blooie" line occurred at 1030 hours on September 23, 1967, and lasted for five days.

References: (C) (E) (H) (AW) (N0)

Test:	LANPHER		
Date:	10/18/67	Sponsor:	LRL
Time:	0730 PDT	Depth of Burial:	2,343 ft
Location:	NTS U2x	Purpose:	Weapons Related
Type:	Shaft	Yield:	20 to 200 kt
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: 5.3

^{133}Xe in curies: 5.2

^{133m}Xe in curies: 8.6×10^{-2}

^{135}Xe in curies: 1.8×10^{-4}

Release Summary: A drillback release occurred from the ventilation line at 0400 hours on October 27, 1967, and lasted for 2.1 hours.

References: (C) (E) (H) (AW) (N1)

Test:

COGNAC

Date:

10/25/67

Sponsor:

LASL

Time:

0730 PDT

Depth of Burial:

787 ft

Location:

NTS U3fm

Purpose:

Weapons Related

Type:

Shaft

Yield:

Less than 20 kt

Release

Detected:

Onsite Only

Type of Release:

Test

Test Release Activity at R+12 Hours, in Curies: 6.4×10^{-2}

Isotopes Identified in the Release: ^{131}I , ^{132}I , ^{133}I , and ^{135}I

Release Summary: All activity released was attributed to the cable pull. The release lasted for three days.

References: (B) (E) (H) (AW)

Test:

SAZERAC

Date:

10/25/67

Sponsor:

LASL

Time:

0730 PDT

Depth of Burial:

988 ft

Location:

NTS U3fa

Purpose:

Weapons Related

Type:

Shaft

Yield:

Less than 20 kt

Release
Detected:

Onsite Only

Type of
Release:

Drillback

Drillback Release Activity at Time of Release, in Curies: 5.2×10^{-2}

^{131}I in curies: 4.9×10^{-3}

^{132}I in curies: 1.7×10^{-2}

^{133}I in curies: 2.7×10^{-2}

^{135}I in curies: 3.0×10^{-3}

Release Summary: A drillback release occurred on October 26, 1967.

References: (B) (E) (H) (AW) (OY)

Test: WORTH

Date:	10/25/67	Sponsor:	RL
Time:	0745 PDT	Depth of Burial:	614 ft
Location:	NTS U10ag	Purpose:	Weapons Related
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: 4.0×10^1

^{133}Xe in curies: 3.4×10^1

$^{133\text{m}}\text{Xe}$ in curies: 1.3

^{135}Xe in curies: 4.6

Release Summary: A drillback release occurred from the ventilation line at 1800 hours on October 28, 1967, and lasted for 40 minutes.

References: (C) (E) (H) (AW) (UA)

POLKA

Date:	12/06/67	Sponsor:	RL
Time:	0500 PST	Depth of Burial:	623 ft
Location:	NTS U10ai	Purpose:	Weapons Related
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Gas Sampling and Drillback

Gas Sampling Activity at Time of Release, in Curies: 3.0×10^2

Isotopes Identified in the Release: ^{135}Xe

Drillback Release Activity at Time of Release, in Curies: 7.5×10^1

^{133}Xe in curies: 2.0×10^1

$^{133\text{m}}\text{Xe}$ in curies: 6.4×10^{-1}

^{135}Xe in curies: 5.4×10^1

Release Summary: A release occurred during a prompt gas sampling operation on December 6, 1967, and lasted from 0725 to 1400 hours.

Four intermittent drillback releases occurred from the ventilation line starting at 1228 hours and lasting until 1715 hours on December 7, 1967, with a total release time of 1.7 hours, and two intermittent drillback releases occurred from the ventilation line starting at 0910 hours and lasting until 1025 hours on December 19, 1967, with a total release time of 50 minutes.

References: (C) (E) (H) (AW) (QC)

Test:	HUPMOBILE		
Date:	01/18/68	Sponsor:	LRL
Time:	0830 PST	Depth of Burial:	810 ft
Location:	NTS U2y	Purpose:	Weapons Effects
Type:	Shaft	Yield:	7.4 kt
Release Detected:	Offsite	Type of Release:	Test

Test Release at R+12 Hours, in Curies: 1.2×10^5

Isotopes Identified in the Release: ^{87}Kr , ^{88}Kr , ^{88}Rb , ^{131}I , ^{133}I , ^{134}I , ^{135}I , ^{133}Xe , and ^{135}Xe

Cloud Direction: Southwesterly, tracked by aircraft to the Death Valley, California, area where the cloud became undetectable

Maximum Activity Detected in Air Offsite: 1,100 picocuries of gross beta activity per cubic meter of air at Dansby's Ranch, Nevada

Maximum Gamma Exposure Rate Detected Offsite: 0.7 mR/h near Dansby's Ranch in the Amargosa Farm Area, Nevada

Maximum Iodine Level Detected Offsite: 1,600 picocuries of ^{135}I per cubic meter of air at Dansby's Ranch, Nevada; maximum ^{133}I concentration in milk, 110 picocuries per liter at Hord Ranch, Lathrop Wells, Nevada; maximum ^{131}I concentration in milk, 30 picocuries per liter at Rooker Ranch, Lathrop Wells, Nevada; maximum ^{131}I concentration on a cow feed sample, 480 picocuries per kilogram at Rooker Ranch, Lathrop Wells, Nevada

Release Summary: Venting from the LOS pipe at the surface ground zero area occurred at H+1.6 minutes and lasted for approximately 100 minutes.

References: (C) (D) (E) (H) (M) (P) (Z) (AW) (EN) (EO) (HN) (N2)

Test:	STACCATO		
Date:	01/19/68	Sponsor:	LRL
Time:	0700 PST	Depth of Burial:	1,455 ft
Location:	NTS U10ah	Purpose:	Weapons Related
Type:	Shaft	Yield:	20 to 200 kt
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: 8.2

^{133}Xe in curies: 2.9

$^{133\text{m}}\text{Xe}$ in curies: 1.4×10^{-1}

^{135}Xe in curies: 5.2

Release Summary: A drillback release occurred from the ventilation line at 0150 hours on January 21, 1968, and lasted for 27 hours, 45 minutes.

References: (C) (E) (H) (AW) (N3)

Test:	BRUSH		
Date:	01/24/68	Sponsor:	LASL
Time:	0700 PST	Depth of Burial:	388 ft
Location:	NTS U3eq	Purpose:	Weapons Related
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Test

Test Release Activity at R+12 Hours, in Curies: 2.0×10^{-5}

Isotopes Identified in the Release: ^{138}Xe and ^{138}Cs

Release Summary: A test release occurred at H+3 minutes from surface ground zero and lasted for five minutes.

References: (B) (E) (H) (AW) (U3)

Test:	CABRIOLET		
Date:	01/26/68	Sponsor:	LRL
Time:	0800 PST	Depth of Burial:	170 ft
Location:	NTS U201	Purpose:	Plowshare
Type:	Crater	Yield:	2.3 kt
Release Detected:	Offsite	Type of Release:	Test/Crater

Test Release at R+12 Hours, in Curies: 2.2×10^{-5}

Isotopes Identified in the Release: ^{87}Kr , ^{88}Kr , ^{88}Rb , ^{91}Sr , ^{131}I , ^{133}I , ^{134}I , ^{135}I , ^{132}Te , ^{133}Xe , ^{135}Xe , and ^{187}W

Cloud Direction: Northerly into southern Idaho, then northeast as far as Big Timber Mountain, Montana

Maximum Activity Detected in Air Offsite: 33,000 picocuries of gross beta activity per cubic meter of air at Stone Cabin Ranch, Nevada

Maximum Gamma Exposure Rate Detected Offsite: 65 mR/h at Clark Station, Nevada

Maximum Iodine Level Detected Offsite: 360 picocuries of ^{131}I per cubic meter of air and 5,400 picocuries of ^{133}I per cubic meter of air at Stone Cabin Ranch, Nevada; 630 picocuries of ^{131}I per liter in milk at Mountain View Ranch, Deeth, Nevada

Maximum Distance Radiation Detected Offsite: Detected on an air sampler at Wells, Nevada

Release Summary: The planned test release from the surface ground zero area occurred at H time and lasted for one minute.

References: (C) (E) (H) (AW) (DO) (DY) (DZ) (EP) (HP) (HQ)

Test:	KNOX		
Date:	02/21/68	Sponsor:	LRL
Time:	0730 PST	Depth of Burial:	2,116 ft
Location:	NTS U2at	Purpose:	Weapons Related
Type:	Shaft	Yield:	20 to 200 kt
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: 1.6×10^2

^{133}Xe in curies: 1.4×10^2

$^{133\text{m}}\text{Xe}$ in curies: 4.4

^{135}Xe in curies: 8.0

Release Summary: Drillback releases occurred from the ventilation line at 2340 hours on February 24, 1968, lasting for three hours and five minutes, and at 1720 hours on February 27, 1968, lasting for three days.

References: (C) (E) (H) (AW) (N4)

Test:	RUSSET		
Date:	03/05/68	Sponsor:	LASL/DoD
Time:	0730 PST	Depth of Burial:	393 ft
Location:	NTS U6a	Purpose:	Weapons Related
Type:	Vertical Shaft/ Tunnel	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Test and Special Packaging Operation

Test Release Activity at R+12 Hours, in Curies: 2.9×10^1

Isotopes Identified in the Release: ^{131}I , ^{133}I , ^{135}I , and ^{138}Xe

Release Activity During Special Packaging Operation at Time of Release, in Curies: 5.9×10^{-5}

^{235}U in curies: 2.4×10^{-5}

^{238}U in curies: 3.5×10^{-5}

Release Summary: A release occurred at H time and during a special packaging operation on April 23-24, 1974.

References: (B) (E) (H) (AW) (EZ) (ST)

Detonations: **BUGGY-A, -B, -C, -D, -E** (simultaneous, separate holes)

Date: 03/12/68 **Sponsor:** LRL

Time: 0904 PST **Depth of Burial:** 135 ft each

Location: NTS U30a-e **Purpose:** Plowshare

Type: Crater **Yield:** 1.08 kt each
(5.4 kt total)

Release Detected:	Type of Release:	
Offsite	Test/Crater	

Test Release at R+12 Hours, in Curies: 1.2×10^6

Isotopes Identified in the Release: ^{91}Sr , ^{131}I , ^{133}I , ^{135}I , ^{132}Te , ^{140}Ba , and ^{187}W

Cloud Direction: Northerly; tracked as far north as Montana

Maximum Activity Detected in Air Offsite: 12,000 picocuries of gross beta activity per cubic meter of air at Warm Springs, Nevada

Maximum Gamma Exposure Rate Detected Offsite: 8.5 mR/h at four miles east of Warm Springs (unpopulated area); 1.5 mR/h at Warm Springs, Nevada (populated)

Maximum Iodine Level Detected Offsite: 4,300 picocuries of ^{135}I per cubic meter of air, 920 picocuries of ^{133}I per cubic meter of air, and 97 picocuries of ^{131}I per cubic meter of air at Warm Springs, Nevada; highest concentration of ^{131}I in milk, 550 picocuries per liter in samples collected near Wells, Nevada, on March 15 and 16, 1968; second highest concentration of ^{131}I in milk, 100 picocuries per liter in a sample collected near Pancake Summit, Nevada, on March 15, 1968

Maximum Distance Radiation Detected Offsite: 0.15 mR/h on Highway 40 in Wells, Nevada

Release Summary: The planned test release from the surface ground zero area occurred at H time lasted for 2.5 minutes. It was not determined which detonation(s) released effluent.

References: (C) (E) (H) (AW) (DP) (DY)

Test:	MILK SHAKE		
Date:	03/25/68	Sponsor:	DoD/LRL
Time:	1045 PST	Depth of Burial:	869 ft
Location:	NTS U5k	Purpose:	Weapons Effects
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Test

Test Release at R+12 Hours, in Curies: 3.0×10^1

Isotopes Identified in the Release: ^{138}Xe

Release Summary: Seepage from a downhole cable occurred from H+7 minutes until H+1 hour.

References: (E) (H) (L) (AW) (E0)

Detonation:	NOOR (simultaneous with THROW, separate holes)		
Date:	04/10/68	Sponsor:	LRL
Time:	0600 PST	Depth of Burial:	1,253 ft
Location:	NTS U2be	Purpose:	Weapons Related
Type:	Shaft	Yield:	20 to 200 kt
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: 1.4

^{133}Xe in curies: 1.2

$^{133\text{m}}\text{Xe}$ in curies: 4.4×10^{-2}

^{135}Xe in curies: 2.2×10^{-1}

Release Summary: Drillback releases occurred from the ventilation line at 1340 hours on April 12, 1968, lasting for 40 minutes, and at 1400 hours on April 14, 1968, lasting for 30 minutes.

References: (C) (E) (H) (AW) (UZ)

Test: SHUFFLE

Date:	04/18/68	Sponsor:	LRL
Time:	0605 PST	Depth of Burial:	1,619 ft
Location:	NTS U10t	Purpose:	Weapons Related
Type:	Shaft	Yield:	20 to 200 kt
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: 1.9×10^1

^{133}Xe in curies: 1.8×10^1

$^{133\text{m}}\text{Xe}$ in curies: 5.5×10^{-1}

^{135}Xe in curies: 3.5×10^{-1}

Release Summary: Drillback releases occurred from the ventilation line at 2330 hours on April 21, 1968, lasting for 110 minutes, and at 1315 hours on April 23, 1968, lasting for 70 minutes.

References: (C) (E) (H) (AW) (N5)

Test: SCROLL

Date:	04/23/68	Sponsor:	LRL/ARPA
Time:	0901 PST	Depth of Burial:	750 ft
Location:	NTS U19n	Purpose:	Vela Uniform
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Test

Test Release at R+12 Hours, in Curies: 1.8×10^4

Isotopes Identified in the Release: ^{87}Kr , ^{88}Kr , ^{88}Rb , ^{131}I , ^{133}I , ^{135}I , ^{133}Xe , ^{135}Xe , ^{137}Xe , ^{138}Xe , and ^{138}Cs

Release Summary: A test release from surface ground zero, Satellite No. 1, occurred at H+184 minutes.

References: (C) (E) (H) (AW)

Test:	CROCK		
Date:	05/08/68	Sponsor:	LR
Time:	0710 PDT	Depth of Burial:	594 ft
Location:	NTS U10ak	Purpose:	Weapons Related
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: 1.4×10^2

^{133}Xe in curies: 9.6×10^1

$^{133\text{m}}\text{Xe}$ in curies: 4.1

^{135}Xe in curies: 3.7×10^1

Release Summary: Drillback releases occurred from the ventilation line at 0220 hours on May 11, 1968, lasting for 115 minutes, and at 1300 hours on the same day, lasting for one hour.

References: (C) (E) (H) (AW) (U8)

Test:	ADZE		
Date:	05/28/68	Sponsor:	LASL
Time:	0745 PDT	Depth of Burial:	787 ft
Location:	NTS U3fw	Purpose:	Weapons Related
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Test

Test Release Activity at R+12 Hours, in Curies: 7.0×10^{-3}

Isotopes Identified in the Release: ^{133}I , ^{135}I , and ^{138}Xe

Release Summary: All activity released was attributed to the cable pull.

References: (B) (E) (H) (AW)

Detonation:	TUB-D (simultaneous with TUB-A, -B, -C, -F, separate holes)		
Date:	06/06/68	Sponsor:	LRL
Time:	1430 PDT	Depth of Burial:	896 ft
Location:	NTSU10ajD	Purpose:	Weapons Related
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Gas Sampling

Gas Sampling Release at Time of Release, in Curies: 1.6×10^3

Isotopes Identified in the Release: ^{87}Kr , ^{88}Kr , ^{133}Xe , and ^{135}Xe

Release Summary: A gas sampling release occurred from hole D on June 6, 1968, at approximately H+2 hours and lasted for two hours and five minutes.

References: (C) (E) (H) (AW) (N6)

Test: **FUNNEL**

Date:	06/25/68	Sponsor:	LASL
Time:	0830 PDT	Depth of Burial:	387 ft
Location:	NTS U3ga	Purpose:	Weapons Related
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Test

Test Release Activity at R+12 Hours, in Curies: 2.0×10^{-5}

Release Summary: A test release occurred at H+3 minutes from surface ground zero.

References: (B) (E) (H) (AW) (V8)

Test: **SEVILLA**

Date:	06/25/68	Sponsor:	LASL
Time:	0830 PDT	Depth of Burial:	1,175 ft
Location:	NTS U3fk	Purpose:	Weapons Related
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Test

Test Release Activity at R+12 Hours, in Curies: 4.0×10^{-3}

Isotopes Identified in the Release: ^{135}Xe and ^{135}I

Release Summary: The activity released was attributed to the cable pull.

References: (B) (E) (H) (AW) (UJ)

Test:	TANYA		
Date:	07/30/68	Sponsor:	LRL
Time:	0600 PDT	Depth of Burial:	1,250 ft
Location:	NTS U2dt	Purpose:	Weapons Related
Type:	Shaft	Yield:	20 to 200 kt
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: 1.4×10^2

^{133}Xe in curies: 1.3×10^2

$^{133\text{m}}\text{Xe}$ in curies: 4.2

^{135}Xe in curies: 2.1

Release Summary: Drillback releases occurred from the ventilation line at 2150 hours on August 3, 1968, lasting for one hour, and at 2310 hours, lasting for ten minutes.

References: (C) (E) (H) (AX) (N7)

Test:	IMP		
Date:	08/09/68	Sponsor:	LRL
Time:	0600 PDT	Depth of Burial:	597 ft
Location:	NTS U2bj	Purpose:	Weapons Related
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Test

Test Release Activity at R+12 Hours, in Curies: 4.2×10^3

Isotopes Identified in the Release: ^{87}Kr , ^{88}Kr , ^{88}Rb , ^{131}I , ^{133}I , ^{135}I , ^{133}Xe , ^{135}Xe , ^{138}Xe , and ^{138}Cs

Release Summary: A test release occurred from the crater at 0803 hours on August 9, 1968, and lasted for 2.5 days.

References: (C) (E) (H) (AX) (V9)

RACK			
Date:	08/15/68	Sponsor:	RL
Time:	1000 PDT	Depth of Burial:	655 ft
Location:	NTS U9ap	Purpose:	Weapons Related
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Gas Sampling and Drillback

Gas Sampling Release Activity at Time of Release, in Curies: 9.5×10^{-1}

Isotopes Identified in the Release:* ^{88}Kr and ^{135}Xe

Drillback Release Activity at Time of Release, in Curies: 2.8×10^{-1}

^{133}Xe in curies: 1.0×10^{-1}

^{133m}Xe in curies: 5.0×10^{-3}

^{135}Xe in curies: 1.7×10^{-1}

Release Summary: A release occurred from the gas sampling line at 1208 hours on August 15, 1968, and lasted for 25 minutes.

A drillback release occurred from the ventilation line at 0800 hours on August 17, 1968, and lasted for 30 minutes.

References: (C) (E) (H) (AX) (UD)

*Quantitative isotopic data is not available.

DIANA MOON			
Date:	08/27/68	Sponsor:	DoD/LASL
Time:	0930 PDT	Depth of Burial:	794 ft
Location:	NTS U11e	Purpose:	Weapons Effects
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Test

Test Release at R+12 Hours, in Curies: 1.2×10^4

Isotopes Identified in the Release: ^{131}I , ^{133}I , ^{135}I , ^{135}Xe , and ^{138}Xe

Release Summary: Uncontrolled Releases occurred as follows:

1. Seepage from the surface ground zero area occurred from H+3 to H+17 minutes. Effluent consisted primarily of ^{138}Xe with small quantities of ^{131}I , ^{133}I , and ^{135}I .

2. Seepage from the surface ground zero area occurred from H+5 to H+13 hours. Effluent consisted primarily of ^{135}Xe with small quantities of radioiodine.

Total radioiodines released from the DIANA MOON test were estimated to be 3.6 curies of ^{135}I , 2.1 curies of ^{133}I , and 0.1 curies of ^{131}I (at the time of release).

References: (B) (E) (H) (L) (P) (AX) (EX) (N8)

Test:	NOGGIN		
Date:	09/06/68	Sponsor:	LRL
Time:	0700 PDT	Depth of Burial:	1,909 ft
Location:	NTS U9bx	Purpose:	Weapons Related
Type:	Shaft	Yield:	20 to 200 kt
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: 1.6×10^1

^{133}Xe in curies: 1.5×10^1

$^{133\text{m}}\text{Xe}$ in curies: 5.2×10^{-1}

^{135}Xe in curies: 9.6×10^{-1}

Release Summary: Drillback releases occurred from the ventilation line at 0940 hours on September 9, 1968, lasting for 140 minutes, and at 1415 hours on September 10, 1968, lasting for 60 minutes.

References: (C) (E) (H) (AX) (J1)

Test:	STODDARD		
Date:	09/17/68	Sponsor:	LRL
Time:	0700 PDT	Depth of Burial:	1,535 ft
Location:	NTS U2cmS	Purpose:	Plowshare
Type:	Shaft	Yield:	20 to 200 kt
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: 1.6×10^1

^{133}Xe in curies: 1.5×10^1

$^{133\text{m}}\text{Xe}$ in curies: 4.4×10^{-1}

^{135}Xe in curies: 1.3×10^{-1}

Release Summary: Drillback releases occurred from the ventilation line at 1330 hours on September 21, 1968, lasting for 40 minutes, and at 1500 hours on September 22, 1968, lasting for two hours.

References: (C) (E) (H) (AX) (N9)

Test:	HULA		
Date:	10/29/68	Sponsor:	LRL
Time:	0836 PST	Depth of Burial:	656 ft
Location:	NTS U9bu	Purpose:	Weapons Related
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Test, Gas Sampling, and Drillback

Test Release at R+12 Hours, in Curies: 6.0×10^{-2}

Gas Sampling Release Activity at Time of Release, in Curies: 5.0

Isotopes Identified in the Release: ^{87}Kr , ^{88}Kr , ^{133}Xe , and ^{135}Xe

Drillback Release Activity at Time of Release, in Curies: 2.9

^{133}Xe in curies: 2.0

^{133m}Xe in curies: 8.5×10^{-2}

^{135}Xe in curies: 8.9×10^{-1}

Release Summary: A test release occurred from the cables at 0920 hours on October 29, 1968, and lasted for one hour.

A planned release occurred from the gas sampling system at 1110 hours on October 29, 1968, and lasted for 35 minutes.

Two intermittent drillback releases occurred from the ventilation line starting at 2100 hours on October 31, 1968, for a total release time of two hours, and two intermittent drillback releases occurred from the ventilation line starting at 0200 hours on November 1, 1968, for a total release time of 1.5 hours.

References: (C) (E) (H) (X) (AX) (VA)

Test:	TINDERBOX		
Date:	11/22/68	Sponsor:	LLNL
Time:	0819 PST	Depth of Burial:	1,450 ft
Location:	NTS U9az	Purpose:	Weapons Related
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: 2.0

^{133}Xe in curies: 1.2

$^{133\text{m}}\text{Xe}$ in curies: 5.4×10^{-2}

^{135}Xe in curies: 7.2×10^{-1}

Release Summary: A drillback release occurred from the ventilation line at 2140 hours on November 24, 1968, and lasted for 50 minutes.

References: (C) (E) (H) (AX) (L5)

Test:	SCHOONER		
Date:	12/08/68	Sponsor:	LLNL
Time:	0800 PST	Depth of Burial:	365 ft
Location:	NTS U20u	Purpose:	Plowshare
Type:	Crater	Yield:	30 kt
Release Detected:	Offsite	Type of Release:	Test/Crater

Test Release at R+12 Hours, in Curies: 3.7×10^6

Isotopes Identified in the Release: ^{54}Mn , ^{106}Ru , ^{131}I , ^{137}Cs , ^{181}W , and ^{187}W

Cloud Direction: Northeasterly across Utah and Colorado; the base surged north to Idaho, then east across Montana and North Dakota

Maximum Activity Detected in Air Offsite: 280,000 picocuries of ^{187}W per cubic meter of air at Clark Station, Nevada

Maximum Gamma Exposure Rate Detected Offsite: 350 mR/h on Highway 25 (Nevada) near the Lincoln-Nye county line (unpopulated), and 8.5 mR/h at the Diablo Maintenance Station, Nevada (populated)

Maximum Iodine Level Detected Offsite: 28 picocuries of ^{131}I per cubic meter of air and 680 picocuries of ^{133}I per cubic meter of air at Clark Station, Nevada; highest concentration of ^{135}I in air at Warm Springs, Nevada, 220 picocuries per cubic meter; highest concentration of

¹³¹I in milk, 100 picocuries per liter in a December 11, 1968, sample from the Boyd Schena Ranch near Abraham, Utah

Maximum Distance Radiation Detected Offsite: 0.2 mR/h at Delta, Utah

Release Summary: The planned test release from the surface ground zero area occurred at H time and lasted for one minute.

References: (C) (E) (H) (M) (AX) (DQ)

Detonations: **TYG-A, -B, -C** (simultaneous with TYG-D, -E, and -F, separate holes)

Date:	12/12/68	Sponsor:	LRL
Time:	0710 PST	Depth of Burial:	U2dc4 (-A) 749 ft U2dc5 (-B) 824 ft U2dc3 (-C) 749 ft
Location:	NTS U2dc4 (-A) NTS U2dc5 (-B) NTS U2dc3 (-C)	Purpose:	Weapons Related
Type:	Shaft	Yield:	Less than 20 kt (each)
Release Detected:	Onsite Only	Type of Release:	Test and Drillback

Test Release at R+12 Hours, in Curies: 6.8×10^3

Isotopes Identified in the Release: ^{133}Xe and ^{135}Xe

Drillback Release Activity at Time of Release, in Curies: 4.8×10^1

^{133}Xe in curies: 4.6×10^1

$^{133\text{m}}\text{Xe}$ in curies: 7.8×10^{-1}

^{135}Xe in curies: 1.2

Release Summary: Test releases occurred from the U2dc4 (TYG A) surface ground zero area at H+4.75 hours, lasting for 19.25 hours and from the U2dc5 (TYG B) surface ground zero area at H+26.4 hours, lasting for 23.2 hours.

Drillback releases occurred from the ventilation line No. 3, U2dc3 (TYG C), at 1450 hours on December 15, 1968, lasting for 40 minutes; at 1530 hours on December 19, 1968, lasting for 30 minutes; and at 1440 hours on December 21, 1968, lasting for 20 minutes.

References: (C) (E) (H) (X) (AX) (MH) (NA)

Test:	SCISSORS		
Date:	12/12/68	Sponsor:	LASL
Time:	0720 PST	Depth of Burial:	789 ft
Location:	NTS U3gh	Purpose:	Weapons Related
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Test

Test Release at R+12 Hours, in Curies: 1.3×10^{-4}

Isotopes Identified in the Release: ^{138}Xe

Release Summary: A test release occurred from surface ground zero at H+6 minutes and lasted for 38 minutes.

References: (B) (E) (H) (AX)

Test:	PACKARD		
Date:	01/15/69	Sponsor:	LLNL
Time:	1130 PST	Depth of Burial:	810 ft
Location:	NTS U2u	Purpose:	Weapons Effects
Type:	Shaft	Yield:	10 kt
Release Detected:	Onsite Only	Type of Release:	Test

Test Release at R+12 Hours, in Curies: 7.2

Release Summary: A test release from the surface ground zero area occurred at H+10.4 minutes and lasted for 15 minutes.

References: (C) (E) (H) (AX) (NB)

Test:	VALISE		
Date:	03/18/69	Sponsor:	LLNL
Time:	0630 PST	Depth of Burial:	296 ft
Location:	NTS U9by	Purpose:	Safety Experiment
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Gas Sampling

Gas Sampling Release Activity at Time of Release, in Curies: Less than 1.0×10^{-3}

Release Summary: A release occurred during a gas sampling operation at zero time and lasted for one hour

References: (E) (H) (AX) (VB)

Test:	CHATTY		
Date:	03/18/69	Sponsor:	LRL
Time:	0640 PST	Depth of Burial:	639 ft
Location:	NTS U2bn	Purpose:	Weapons Related
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: 6.7×10^{-1}

^{133}Xe in curies: 1.5×10^{-1}

$^{133\text{m}}\text{Xe}$ in curies: 7.6×10^{-3}

^{135}Xe in curies: 5.1×10^{-1}

Release Summary: A drillback release occurred from the ventilation line at 1925 hours on March 19, 1969, and lasted for 25 minutes.

References: (C) (E) (H) (AX) (U5)

Test:	BARSAC		
Date:	03/20/69	Sponsor:	LASL
Time:	1012 PST	Depth of Burial:	997 ft
Location:	NTS U3gc	Purpose:	Weapons Related
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Test

Test Release at R+12 Hours, in Curies: 4.3×10^{-1}

Isotopes Identified in the Release: ^{131}I , ^{133}I , ^{135}I , ^{133}Xe , and ^{135}Xe

Release Summary: A test release from the surface ground zero area occurred at H+10 hours, 59 minutes and lasted for 29.8 hours.

References: (B) (E) (H) (AX) (TS)

Test:	COFFER		
Date:	03/21/69	Sponsor:	LLNL
Time:	0630 PST	Depth of Burial:	1,525 ft
Location:	NTS U2de	Purpose:	Weapons Related
Type:	Shaft	Yield:	Less than 100 kt
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: 1.0×10^2

^{133}Xe in curies: 9.9×10^1

$^{133\text{m}}\text{Xe}$ in curies: 2.4

^{135}Xe in curies: 8.0×10^{-2}

Release Summary: Drillback releases occurred from the ventilation line at 1100 hours on March 27, 1969, lasting for 8.3 hours, and at 0600 hours on March 28, 1969, lasting for 5.5 hours.

References: (C) (E) (H) (AX) (NC)

Test:	BLENTON		
Date:	04/30/69	Sponsor:	LASL
Time:	1000 PDT	Depth of Burial:	1,831 ft
Location:	NTS U7p	Purpose:	Weapons Related
Type:	Shaft	Yield:	20 to 200 kt
Release Detected:	Onsite Only	Type of Release:	Test

Test Release at R+12 Hours, in Curies: 9.0×10^{-5}

Isotopes Identified in the Release: ^{138}Xe

Release Summary: A test release occurred from the surface ground zero area at H+10 minutes and lasted for 18.8 hours.

References: (B) (E) (H) (AX) (TT)

Detonation:	IPECAC-A (simultaneous with IPECAC-B, separate holes)		
Date:	05/27/69	Sponsor:	LASL
Time:	0700 PDT	Depth of Burial:	407 ft
Location:	NTS U3hk-a	Purpose:	Safety Experiment
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Test

Test Release at R+12 Hours: Trace

Isotopes Identified in the Release: xenons

Release Summary: A test release occurred from surface ground zero at H+12 minutes and lasted for 2.8 hours. All activity from this release was attributed to cable off-gassing from the catcher pull.

References: (B) (E) (H) (AX) (VC)

Test:	TAPPER		
Date:	06/12/69	Sponsor:	LASL
Time:	0700 PDT	Depth of Burial:	994 ft
Location:	NTS U3go	Purpose:	Weapons Related
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Test

Test Release at R+12 Hours, in Curies: 4.6×10^{-6}

Isotopes Identified in the Release: ^{138}Xe

Release Summary: A test release occurred from the surface ground zero area at H+16 minutes and lasted for 23 minutes.

References: (B) (E) (H) (AX) (J2)

Test:	HUTCH		
Date:	07/16/69	Sponsor:	LRL
Time:	0755 PDT	Depth of Burial:	1,800 ft
Location:	NTS U2df	Purpose:	Weapons Related
Type:	Shaft	Yield:	20 to 200 kt
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: 1.1×10^3

^{133}Xe in curies: 9.0×10^2

$^{133\text{m}}\text{Xe}$ in curies: 2.9×10^1

^{135}Xe in curies: 1.5×10^2

Release Summary: Drillback releases occurred from the ventilation line as follows: (1) at 0430 hours on July 19, 1969, lasting for 8.5 hours; (2) at 0700 hours on July 22, 1969, lasting for 2.75 hours; (3) at 1540 hours on July 23, 1969, lasting for 5.83 hours; and (4) at 0705 hours on July 25, 1969, lasting for 20 minutes.

References: (C) (E) (H) (AA) (ND)

Detonations: SPIDER-A, -B (simultaneous, separate holes)

Date:	08/14/69	Sponsor:	LRL
Time:	0730 PDT	Depth of Burial:	699 ft, 745 ft
Location:	NTS U2bp-1, -2	Purpose:	Weapons Related
Type:	Shaft	Yield:	Less than 20 kt (each)
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: 1.7

^{133}Xe in curies: 1.7

$^{133\text{m}}\text{Xe}$ in curies: 3.5×10^{-2}

Release Summary: A drillback release occurred from the ventilation line at 1920 hours on August 21, 1969, and lasted for five minutes.

References: (C) (E) (H) (AA) (NE)

Test: PLIERS

Date:	08/27/69	Sponsor:	LASL
Time:	0645 PDT	Depth of Burial:	784 ft
Location:	NTS U3gn	Purpose:	Weapons Related
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Test

Test Release at R+12 Hours, in Curies: 1.6×10^{-2}

Isotopes Identified in the Release: ^{135}I and ^{138}Xe

Release Summary: A test release from the surface ground zero area occurred at H+8 minutes and lasted for 5.6 hours.

References: (B) (E) (H) (P) (AA) (JS)

Test:	RULISON		
Date:	09/10/69	Sponsor:	LASL/DPNE
Time:	1500 MDT	Depth of Burial:	8,425 ft
Location:	Grand Valley, Colorado	Purpose:	Plowshare
Type:	Shaft	Yield:	40 kt
Release Detected:	Offsite	Type of Release:	Drillback

Drillback Release Activity at Time of Release: Gas flaring

Maximum Activity Detected in Air Offsite: Tritium was detected above background levels during flaring operations.

Maximum Gamma Exposure Rate Detected Offsite: No gamma radiation was detected.

Maximum Iodine Level Detected Offsite: No iodine was detected offsite.

Maximum Distance Radiation Detected Offsite: No gamma radiation was detected.

Release Summary: Well gas was first flared on August 1, 1970. A successful high-rate flaring commenced at 1430 hours MST on October 26, 1970. Krypton-85 and tritium were identified in the controlled release.

References: (C) (E) (H) (AA) (DR) (HR)

Test:	MINUTE STEAK		
Date:	09/12/69	Sponsor:	DoD/LRL
Time:	1103 PDT	Depth of Burial:	867 ft
Location:	NTS U11f	Purpose:	Weapons Effects
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Test

Test Release at R+12 Hours, in Curies: 8.4×10^3

Isotopes Identified in the Release: ^{131}I , ^{133}I , ^{135}I , ^{133}Xe , ^{135}Xe , ^{138}Xe , and ^{138}Cs

Release Summary: A test release, in the form of seepage from the surface ground zero area, occurred at H+5 minutes and continued until H+4 hours. The effluent consisted primarily of ^{138}Xe and ^{135}Xe , with lesser quantities of ^{133}Xe . Radioiodine released (at the time of release) included 34 curies of ^{135}I , 3.4 curies of ^{133}I , and 0.05 curies of ^{131}I .

References: (C) (E) (H) (L) (N) (P) (AA) (E1) (NF)

Detonation: **KYACK-B** (simultaneous with KYACK-A, separate holes)

Date:	09/20/69	Sponsor:	LLNL
Time:	0730 PDT	Depth of Burial:	630 ft
Location:	NTS U2bq-2	Purpose:	Weapons Related
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Test

Test Release at R+12 Hours, in Curies: 5.1×10^2

Isotopes Identified in the Release: ^{135}Xe

Release Summary: A test release occurred from the U2bq-2 crater at H+9.5 hours and lasted for 16 hours.

References: (C) (E) (H) (AA) (VD)

Detonation: **SEAWEED-D**
(simultaneous with SEAWEED-C and -E, separate holes)

Date:	10/01/69	Sponsor:	LASL
Time:	0730 PDT	Depth of Burial:	387 ft
Location:	NTS U3hk-f	Purpose:	Safety Experiment
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Test

Test Release at R+12 Hours, in Curies: 5.0×10^{-8}

Isotopes Identified in the Release: ^{138}Xe

Release Summary: A test release occurred from surface ground zero at H+16 minutes and lasted for 10 minutes.

References: (B) (E) (H) (AA) (UG)

Test:	PIPKIN		
Date:	10/08/69	Sponsor:	LR _L
Time:	0730 PDT	Depth of Burial:	2,050 ft
Location:	NTS U20b	Purpose:	Weapons Related
Type:	Shaft	Yield:	200 to 1000 kt
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: 6.3

^{133}Xe in curies: 6.3

$^{133\text{m}}\text{Xe}$ in curies: 6.2×10^{-3}

Release Summary: Drillback releases occurred from the ventilation line at 1935 hours on November 2, 1969, lasting for 15 minutes, and at 2115 hours on November 2, 1969, lasting for 10 minutes.

References: (C) (E) (H) (AA) (NG)

Test:	SEAWEED B		
Date:	10/16/69	Sponsor:	LASL
Time:	0700 PDT	Depth of Burial:	387 ft
Location:	NTS U3hk	Purpose:	Safety Experiment
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Test

Test Release at R+12 Hours, in Curies: 2.0×10^{-7}

Isotopes Identified in the Release: ^{138}Xe

References: (B) (E) (H) (AA) (UH)

Detonations:	POD-A, -D (simultaneous with POD-B and -C, separate holes)		
Date:	10/29/69	Sponsor:	LR _L
Time:	1200 PST	Depth of Burial:	876 ft, 1,024 ft
Location:	NTS U2ck, U2cj	Purpose:	Weapons Related
Type:	Shaft	Yield:	16.7 kt (total test)
Release Detected:	Offsite	Type of Release:	Test and Drillback

Test Release at R+12 Hours, in Curies: 3.9×10^{-3}

Isotopes Identified in the Release: ^{131}I , ^{133}I , ^{135}I , ^{133}Xe , ^{135}Xe , and ^{138}Cs

Cloud Direction: Southerly; tracked by aircraft for 35 miles before the cloud became undetectable

Maximum Activity Detected in Air Offsite: No fresh fission products were detected.

Maximum Gamma Exposure Rate Detected Offsite: 0.04 mR/h at Lathrop Wells, Nevada

Maximum Iodine Level Detected Offsite: No iodines were detected.

Maximum Distance Radiation Detected Offsite: At four miles north of Pahrump, Nevada, (detected by aerial monitoring)

Drillback Release Activity at Time of Release, in Curies: 3.1×10^{-1}

¹³³Xe in curies: 3.0 x 10¹

^{133m}Xe in curies: 4.9×10^{-1}

Release Summary: A test release from the U2ck surface ground zero area occurred at H+1 minute and lasted for 9 hours.

Drillback releases occurred from the U2cj ventilation line at 0010 hours on November 7, 1969, lasting for 20 minutes, and from the U2ck ventilation line at 1000 hours on November 7, 1969, lasting for one hour.

References: (C) (D) (E) (H) (Q) (X) (Z) (AA) (EQ) (HS) (NH)

Test:	SCUTTLE		
Date:	11/13/69	Sponsor:	LRRL
Time:	0715 PST	Depth of Burial:	540 ft
Location:	NTS U2bh	Purpose:	Weapons Related
Type:	Shaft	Yield:	1.7 kt
Release Detected:	Offsite	Type of Release:	Test

Test Release at R+12 Hours, in Curies: 2.1×10^2

Isotopes Identified in the Release: ^{88}Rb , ^{133}I , ^{135}Xe and ^{138}Cs

Maximum Activity Detected in Air Offsite: No fresh fission products were detected

Maximum Gamma Exposure Rate Detected Offsite: No radiation intensities above background levels were noted.

Maximum Iodine Level Detected Offsite: No iodine was detected

Maximum Distance Radiation Detected Offsite: At five miles southeast of Lathrop Wells, Nevada (detected by aerial monitoring)

Release Summary: A test release occurred at H+5 minutes from the surface ground zero emplacement casing and lasted for three hours.

References: (C) (E) (H) (Z) (AA) (ER) (ES) (NI)

Detonations:	TUN-B, -C, -D (simultaneous with TUN-A, separate holes)		
Date:	12/10/69	Sponsor:	LRL
Time:	0730 PST	Depth of Burial:	637 ft, 637 ft, 840 ft
Location:	NTS U10am-2, -3, -4	Purpose:	Weapons Related
Type:	Shaft	Yield:	Less than 20 kt (each)
Release Detected:	Onsite Only	Type of Release:	Test and Gas Sampling

Test Release at R+12 Hours, in Curies: 7.2×10^1

Gas Sampling Release Activity at R+12 Hours* in Curies: 1.6×10^2

^{135}Xe in curies: 1.1×10^2

^{88}Kr in curies: 6.0

xenons in curies: 4.8×10^1

Release Summary: A test release occurred from the U10am-2 surface ground zero area at H+1 minute and lasted for 32 minutes. A second release occurred from the U10am-3 surface ground zero area at H+1 minute and lasted for 92 minutes.

A gas sampling release occurred from the U10am-3 gas sampling line at 0747 hours on December 10, 1969, and lasted for 35 hours. After postshot drilling began, an additional 48 curies of xenons were released as a result of gas sampling operations. Specifically, 5.8 curies were released from the U10am-3 gas sampling line, and 42 curies were released from the U10am-4 gas sampling line. The releases began at 0210 hours on December 11, 1969, and lasted for two days.

References: (C) (E) (H) (AA) (QD)

*Gas sampling release activity at the time of release is not available.

Detonations:	TERRINE-WHITE, -YELLOW (simultaneous, separate holes)		
Date:	12/18/69	Sponsor:	LRL
Time:	1100 PST	Depth of Burial:	1,499 ft, 1,368 ft
Location:	NTS U9bi-1, -2	Purpose:	Weapons Related
Type:	Shaft	Yield:	20 to 200 kt (each)
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: 4.8×10^1

^{133}Xe in curies: 4.5×10^1

$^{133\text{m}}\text{Xe}$ in curies: 1.5

^{135}Xe in curies: 1.2

Release Summary: Drillback releases occurred from the ventilation line at 1930 hours on December 22, 1969, lasting for two hours, and at 0355 hours on December 23, 1969, lasting for five minutes.

References: (C) (E) (H) (AA) (NJ)

Detonations:	YANNIGAN-RED, -BLUE, -WHITE (simultaneous, separate holes)		
Date:	02/26/70	Sponsor:	LRL
Time:	0730 PST	Depth of Burial:	1,286 ft, 1,293 ft, 1,191 ft
Location:	NTS U2ay-1, -2, -3	Purpose:	Weapons Related
Type:	Shaft	Yield:	20 to 200 kt (each)
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: 3.2×10^2

^{133}Xe in curies: 3.1×10^2

$^{133\text{m}}\text{Xe}$ in curies: 6.9

^{135}Xe in curies: 4.4

Release Summary: Five intermittent drillback releases occurred from the U2ay-2 ventilation line starting at 0420 hours on February 28, 1970, for a total release time of 2.83 hours. Four intermittent releases occurred from the U2ay-3 ventilation line starting at 1500 hours on March 2, 1970, for a total release time of 2.75 hours, and nine intermittent releases occurred from the U2ay-1 ventilation line starting at 1245 hours on March 5, 1970, for a total release time of 6.92 hours.

References: (C) (E) (H) (X) (AA) (UV)

Test:	CYATHUS		
Date:	03/06/70	Sponsor:	LRL
Time:	0624 PST	Depth of Burial:	950 ft
Location:	NTS U8b	Purpose:	Weapons Related
Type:	Shaft	Yield:	8.7 kt
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at R+12 Hours,* in Curies: Less than 4.6×10^1

^{133}Xe in curies:	4.5×10^1
^{135}Xe :	trace
^{131}I , ^{132}I , ^{133}I , and ^{132}Te in curies:	less than 1.0

Release Summary: A drillback release occurred from the drilling rig cellar at 0913 hours on March 13, 1970, and lasted for 27 minutes.

References: (C) (E) (H) (AA) (NK)

*Drillback release activity at the time of release is not available.

Test:	SNUBBER		
Date:	04/21/70	Sponsor:	LASL
Time:	0630 PST	Depth of Burial:	1,129 ft
Location:	NTS U3ev	Purpose:	Weapons Effects
Type:	Shaft	Yield:	12.7 kt
Release Detected:	Offsite	Type of Release:	Test

Test Release at R+12 Hours, in Curies: 5.5×10^4

Isotopes Identified in the Release: ^{131}I , ^{133}I , ^{135}I , ^{133}Xe , ^{135}Xe , and ^{138}Xe

Cloud Direction: Northeasterly; tracked by aircraft to 90 miles from surface ground zero

Maximum Activity Detected in Air Offsite: 6.0 picocuries of gross beta activity per cubic meter of air at Coyote Summit, Nevada (unpopulated)

Maximum Gamma Exposure Rate Detected Offsite: 0.6 mR/h at Coyote Summit, Nevada

Maximum Iodine Level Detected Offsite: 87 picocuries of ^{133}I per cubic meter of air and 300 picocuries of ^{135}I per cubic meter of air at Coyote Summit, Nevada; maximum concentration at Koyne's Mill, Nevada (populated area), 36 picocuries of ^{133}I per cubic meter of air and 86 picocuries of ^{135}I per cubic meter of air

Maximum Distance Radiation Detected Offsite: Koyne's Mill, Nevada (on the ground); the effluent was tracked by aircraft to North Central Arizona, approximately 200 miles from the surface ground zero area.

Release Summary: Test releases occurred from the cables in the trailer area at H+4 minutes, lasting for approximately 11 minutes; from the surface ground zero area at H+15 minutes, lasting for 55 minutes; and from seepage at the surface ground zero area at H+70 minutes, lasting for approximately 23.5 hours.

References: (B) (D) (E) (H) (Z) (AA) (D0) (HT) (ST)

Detonations:	HOD-A (GREEN), -B (RED) (simultaneous, separate holes)		
Date:	05/01/70	Sponsor:	LLNL
Time:	0740 PDT	Depth of Burial:	870 ft, 790 ft
Location:	NTS U9ITS X-20, X-23	Purpose:	Weapons Related
Type:	Shaft	Yield:	Less than 20 kt (each)
Release Detected:	Onsite Only	Type of Release:	Test and Drillback

Test Release at R+12 Hours, in Curies: 1.0

Drillback Release Activity at Time of Release, in Curies: 2.7×10^2

^{133}Xe in curies: 1.5×10^2

$^{133\text{m}}\text{Xe}$ in curies: 7.7×10^{-1}

^{135}Xe in curies: 5.9×10^1

^{88}Kr in curies: 5.9×10^1

Release Summary: A test release from the U9ITS X-20 surface ground zero area occurred at H+1 minute and lasted for 13 minutes.

Drillback releases occurred from the U9ITS X-20 gas sampling line at 0745 hours on May 1, 1970, lasting for 16.3 hours; from the U9ITS X-23 gas sampling line at 0746 hours on May 1, 1970, lasting for 1.4 hours; and from the U9ITS X-23 ventilation line at 2150 hours on May 16, 1970, lasting for 6.2 hours.

References: (C) (E) (H) (AA) (NL)

Test:	MINT LEAF		
Date:	05/05/70	Sponsor:	DoD/LRL
Time:	0830 PDT	Depth of Burial:	1,300 ft
Location:	NTS U12t.01	Purpose:	Weapons Effects
Type:	Tunnel	Yield:	Less than 20 kt
Release Detected:	Offsite	Type of Release:	Controlled

Controlled Release Activity at Time of Release, in Curies: 9.6×10^5

Controlled Release Activity at R+12 Hours, in Curies: 3.9×10^5

Isotopes Identified in the Release: ^{85m}Kr , ^{131}I , ^{133}I , ^{135}I , ^{133}Xe , ^{133m}Xe , and ^{135}Xe

Cloud Direction: Easterly

Maximum Activity Detected in Air Offsite: 6,000 picocuries of ^{135}Xe per cubic meter of air on Highway 25 Nevada (populated), no gross beta detected

Maximum Gamma Exposure Rate Detected Offsite: 0.02 mR/h near Queen City Summit, Nevada (unpopulated)

Maximum Iodine Level Detected Offsite: No special water, milk, or other samples were collected for this test.

Maximum Distance Radiation Detected Offsite: 0.02 mR/h at Queen City Summit, Nevada

Release Summary: Three controlled releases occurred as follows: (1) during gas sampling between H+4.6 and H+7.5 hours when predominantly fission gases (^{135}Xe and ^{85m}Kr) were exhausted into the ventilation lines and passed through the filter system before being released to the atmosphere; (2) during ventilation of the tunnel complex with the effluent (approximately 98% ^{135}Xe , 2% ^{133}Xe , and less than 1 curie of radioiodines) passing through the filter system between H+24 and H+31 hours; and (3) during ventilation of the tunnel complex at H+166.2 hours until the tunnel was cleared with the effluent (^{133}Xe and ^{133m}Xe) released passing through a filter system.

References: (C) (D) (E) (H) (L) (AA) (ET) (FE) (HU) (HV)

Test:	DIAMOND DUST		
Date:	05/12/70	Sponsor:	DoD/LASL
Time:	0700 PDT	Depth of Burial:	728 ft
Location:	NTS U16a.05	Purpose:	Vela Uniform
Type:	Tunnel	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Controlled

Controlled Release Activity at Time of Release, in Curies: 5.0

Controlled Release Activity at R+12 Hours, in Curies: 4.0

Isotopes Identified in the Release: ^{133}Xe and $^{133\text{m}}\text{Xe}$

Release Summary: A controlled release, with the permission of the Test Manager, occurred at H+73.4 hours and continued until the tunnel was cleared.

References: (E) (H) (L) (AA) (DW) (TZ)

Test:	MANZANAS		
Date:	05/21/70	Sponsor:	LASL
Time:	0700 PDT	Depth of Burial:	791 ft
Location:	NTS U3gr	Purpose:	Weapons Related
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Test

Test Release at R+12 Hours, in Curies: 7.0×10^{-2} - 1.5×10^{-1}

Release Summary: A test release occurred at H+6 minutes from the surface ground zero area and lasted for five minutes.

References: (B) (E) (H) (AA) (J8)

Test:	HUDSON MOON		
Date:	05/26/70	Sponsor:	DoD/LRL
Time:	0716 PDT	Depth of Burial:	1,385 ft
Location:	NTS U12e.12	Purpose:	Weapons Effects
Type:	Tunnel	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Controlled and Uncontrolled

Controlled Release Activity at Time of Release, in Curies: 5.0×10^2

Controlled Release Activity at R+12 Hours, in Curies: 3.3×10^2

Isotopes Identified in the Release: ^{133}Xe and ^{135}Xe

Uncontrolled Release at R+12 Hours, in Curies: 7.9×10^2

Isotopes Identified in the Release: $^{85\text{m}}\text{Kr}$, ^{88}Kr , ^{131}I , ^{133}I , ^{135}I , and ^{135}Xe

Release Summary: Two test releases occurred as follows: (1) an uncontrolled release (primarily ^{135}Xe , with lesser quantities of ^{88}Kr and $^{85\text{m}}\text{Kr}$) between H+2.3 and H+25.3 hours through the tunnel ventilation system, apparently due to natural draft, but was passed through the

filter system before its release to the atmosphere, and (2) a controlled release of the tunnel area to the gas seal door between H+25.3 and H+26.4 hours to ensure that effluent (primarily ^{135}Xe) was filtered before release to the atmosphere.

Ventilation of the total tunnel complex was started on July 7, 1970, but the activity released (^{133}Xe) was below the detection limit (25 mCi/min) of the RAM system. This activity did not contribute to the total amount of effluent released from the HUDSON MOON test.

References: (C) (E) (H) (L) (AA) (NN)

Detonations: **FLASK-GREEN, -YELLOW, -RED**
(simultaneous, separate holes)

Date:	05/26/70	Sponsor:	LRL
Time:	0800 PDT	Depth of Burial:	1,736 ft, 1,099 ft, 499 ft
Location:	NTS U2az-1, -2, -3	Purpose:	Plowshare
Type:	Shaft	Yield:	105 kt (-Green) Less than 20 kt each (-Yellow & -Red)
Release Detected:	Onsite Only	Type of Release:	Test and Drillback

Test Release at R+12 Hours, in Curies: 4.9×10^1

Drillback Release Activity at Time of Release, in Curies: 1.4×10^1

^{133}Xe in curies: 1.4×10^1

^{133m}Xe in curies: 2.5×10^{-1}

^{135}Xe in curies: 1.1×10^{-2}

Release Summary: Test releases occurred from the U2az-3 gas sampling line at H hour, lasting for 71 minutes, and from the U2az-3 surface ground zero area, as the result of a cable pull, at H+6.5 hours on May 26, 1970, lasting for approximately 3.3 hours.

Drillback releases occurred from the U2az-2 ventilation line at 2140 hours on May 31, 1970, lasting for 25 minutes, and from the U2az-1 ventilation line at 1640 hours on June 4, 1970, lasting for 50 minutes.

References: (C) (E) (H) (X) (AA) (NM)

Test:	PITON-C		
Date:	05/28/70	Sponsor:	LLNL
Time:	0445 PDT	Depth of Burial:	330 ft
Location:	NTS U9ITS AA-25	Purpose:	Weapons Related
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Test

Test Release at R+12 Hours, in Curies: 2.5×10^4

Release Summary: A test release occurred from the surface ground zero area at H+30 seconds, lasting for 2.4 hours.

References: (C) (E) (H) (AA) (VE)

Detonation:	PITON-A (simultaneous with PITON-B, separate holes)		
Date:	05/28/70	Sponsor:	LLNL
Time:	0500 PDT	Depth of Burial:	774 ft
Location:	NTS U9ITS Y-30	Purpose:	Weapons Related
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Test

Test Release at R+12 Hours, in Curies: Greater than 1.0×10^1

Release Summary: A test release of greater than 10 curies occurred, but this was masked by the PITON-C release.

References: (C) (E) (H) (AA) (VE)

Detonation:	ARNICA-VIOLET (simultaneous with ARNICA-YELLOW, separate holes)		
Date:	06/26/70	Sponsor:	LLNL
Time:	0600 PDT	Depth of Burial:	866 ft
Location:	NTS U2dd-3	Purpose:	Weapons Related
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: 7.3×10^1

^{133}Xe in curies: 7.1×10^1

$^{133\text{m}}\text{Xe}$ in curies: 1.8

^{135}Xe in curies: 7.6×10^{-2}

Release Summary: Drillback releases occurred from the U2dd-3 ventilation line at 1045 hours on July 2, 1970, lasting for 30 minutes, and at 1310 hours on July 2, 1970, lasting for 30 minutes.

References: (C) (E) (H) (AA) (NO)

Detonations: SCREE-ACAJOU, -ALHAMBRA
(simultaneous with SCREE-CHAMOIS, separate holes)

Date:	10/13/70	Sponsor:	LRL
Time:	0805 PDT	Depth of Burial:	815 ft, 630 ft
Location:	NTS U9ITS X-24, Z-21	Purpose:	Weapons Related
Type:	Shaft	Yield:	Less than 20 kt (each)
Release Detected:	Onsite Only	Type of Release:	Test and Drillback

Test Release at R+12 Hours, in Curies: 1.1×10^1

Drillback Release Activity at Time of Release, in Curies: 2.4×10^2

^{133}Xe in curies: 2.0×10^2

$^{133\text{m}}\text{Xe}$ in curies: 6.5

^{135}Xe in curies: 3.7×10^1

Release Summary: A test release occurred from the U9ITS X-24 surface ground zero area at about H+1.5 minutes and lasted for 19 minutes.

Six intermittent drillback releases occurred from the U9ITS X-24 ventilation line starting at 1448 hours on October 15, 1970, for a total release time of 8.92 hours, and ten intermittent releases occurred from the U9ITS Z-21 ventilation line starting at 0940 hours on October 18, 1970, for a total release time of 10.75 hours.

References: (C) (E) (H) (X) (AB) (QE)

Detonation:	TRUCHAS-CHAMISAL (simultaneous with TRUCHAS-CHACON and -RODARTE, separate holes)		
Date:	10/28/70	Sponsor:	LASL
Time:	0630 PST	Depth of Burial:	387 ft
Location:	NTS U3ho	Purpose:	Safety Experiment
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Test

Test Release at R+12 Hours, in Curies: 3.0

Isotopes Identified in the Release: ^{133}Xe , ^{135}Xe , and $^{140}\text{Ba}/^{140}\text{La}$

Release Summary: A test release occurred at zero time from cables and lasted for less than one minute.

References: (B) (E) (H) (AB)

Detonation:	AVENS-CREAM (simultaneous with AVENS-ANDORRE, -ALKERMES, and -ASAMLTE, separate holes)		
Date:	12/16/70	Sponsor:	LRL
Time:	0800 PST	Depth of Burial:	965 ft
Location:	NTS U9ITS X-29	Purpose:	Weapons Related
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Test

Test Release at R+12 Hours, in Curies: 6.6×10^1

Isotopes Identified in the Release: ^{135}Xe , ^{138}Xe , and ^{138}Cs

Release Summary: A test release from the cables occurred at H+5 minutes and lasted for 39 minutes.

References: (C) (E) (H) (AB) (U0)

CARPETBAG			
Date:	12/17/70	Sponsor:	LLNL
Time:	0805 PST	Depth of Burial:	2,170 ft
Location:	NTS U2dg	Purpose:	Weapons Related
Type:	Shaft	Yield:	220 kt
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: 4.9

^{133}Xe in curies: 4.8

$^{133\text{m}}\text{Xe}$ in curies: 1.2×10^{-1}

^{135}Xe in curies: 4.7×10^{-3}

Release Summary: A drillback release occurred from the ventilation line at 0615 hours on December 23, 1970, and lasted for 15 minutes.

References: (C) (E) (H) (AB) (NP)

BANEERRY			
Date:	12/18/70	Sponsor:	LLNL
Time:	0730 PST	Depth of Burial:	912 ft
Location:	NTS U8d	Purpose:	Weapons Related
Type:	Shaft	Yield:	10 kt
Release Detected:	Offsite	Type of Release:	Test

Test Release at R+12 Hours, in Curies: 6.7×10^6

Isotopes Identified in the Release: Gross fission products

Cloud Direction: Northeasterly, parts of the cloud moved over Nevada, Utah, and Wyoming; another fraction moved towards California

Maximum Activity Detected in Air Offsite: 230 picocuries of ^{131}I per cubic meter and 3,400 picocuries of ^{133}I per cubic meter of air at Stone Cabin Ranch, Nevada

Maximum Gamma Exposure Rate Detected Offsite: Less than 1 mR/h in populated areas; 0.6 mR/h at Stone Cabin Ranch, Nevada

Maximum Iodine Level Detected Offsite: 810 picocuries of ^{131}I per liter in milk at the McCurdy Ranch near Beatty, Nevada

Maximum Distance Radiation Detected Offsite: 0.05 mR/h at Austin, Nevada

Release Summary: Venting occurred from a fissure near surface ground zero at H+3.5 minutes. The effluent venting rate steadily decreased with time, but visible vapor continued to emanate from the fissure for 24 hours after the detonation.

References: (C) (D) (E) (H) (M) (Z) (AB) (DS) (NQ)

Test: HAREBELL

Date:	06/24/71	Sponsor:	LRL
Time:	0700 PDT	Depth of Burial:	1,702 ft
Location:	NTS U2br	Purpose:	Weapons Related
Type:	Shaft	Yield:	20 to 200 kt
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: 8.4×10^2

Release Summary: A drillback release from cracks south-southeast of the drilling pad began at approximately 2330 hours on June 27, 1971, and lasted for two days.

References: (C) (E) (H) (AB) (NR)

Test: CAMPHOR

Date:	06/29/71	Sponsor:	DoD/SL/LRL
Time:	1130 PDT	Depth of Burial:	1,390 ft
Location:	NTS U12g.10	Purpose:	Weapons Effects
Type:	Tunnel	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Test and Controlled

Test Release at R+12 Hours, in Curies: 2.2×10^2

Isotopes Identified in the Release: ^{133}Xe and ^{135}Xe

Controlled Release Activity at Time of Release in Curies: 1.5×10^2

Controlled Release Activity at R+12 Hours, in Curies: 1.4×10^2

Isotopes Identified in the Release: ^{131}I , ^{133}I , and ^{135}I

Release Summary: Test releases occurred from the cable building (on the mesa) at H+1 hour, lasting for 30 minutes and from the portal at H+3.9 hours, lasting for four days.

A controlled release, through the ventilation system of the tunnel complex, began at 1034 hours on July 27, 1971, and lasted for three days.

References: (C) (E) (H) (K) (AB) (NS)

Test: MINIATA

Date:	07/08/71	Sponsor:	LLL
Time:	0700 PDT	Depth of Burial:	1,735 ft
Location:	NTS U2bu	Purpose:	Plowshare
Type:	Shaft	Yield:	83 kt
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: 1.8×10^2

^{133}Xe in curies: 1.8×10^2

$^{133\text{m}}\text{Xe}$ in curies: 2.9

^{135}Xe in curies: 2.2×10^{-3}

^{131}I : trace

Release Summary: A drillback release occurred from the ventilation line at 2100 hours on July 16, 1971, and lasted for approximately 12.3 hours.

References: (C) (E) (H) (AC) (NT)

Test: BRACKEN

Date:	07/09/71	Sponsor:	LLL
Time:	0700 PDT	Depth of Burial:	1,000 ft
Location:	NTS U10aq	Purpose:	Weapons Related
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: 9.6×10^{-1}

^{133}Xe in curies: 4.2×10^{-1}

$^{133\text{m}}\text{Xe}$ in curies: 2.0×10^{-2}

^{135}Xe in curies: 5.2×10^{-1}

Release Summary: Several intermittent drillback releases occurred from the ventilation line beginning at 0810 hours on July 11, 1971, and lasting for six hours.

References: (B) (E) (H) (AC) (U2)

Test:	DIAGONAL LINE		
Date:	11/24/71	Sponsor:	DoD/LLL
Time:	1215 PST	Depth of Burial:	867 ft
Location:	NTS U11g	Purpose:	Weapons Effects
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Offsite	Type of Release:	Test and Seepage

Test Release and Seepage at R+12 Hours, in Curies: 6.8×10^3

Isotopes Identified in the Release: ^{85m}Kr , ^{87}Kr , ^{88}Kr , ^{131}I , ^{132}I , ^{133}I , ^{135}I , ^{131m}Xe , ^{133}Xe , ^{133m}Xe , and ^{135}Xe

Cloud Direction: Southwesterly towards Amargosa Desert area, Nevada

Maximum Activity Detected in Air Offsite: Fresh fission products were not detected.

Maximum Gamma Exposure Rate Detected Offsite: No radiation intensities were detected above background levels.

Maximum Iodine Level Detected Offsite: No iodines were detected in any samples.

Maximum Distance Radiation Detected Offsite: At six miles southeast of Lathrop Wells, Nevada, (detected by aerial monitoring)

Release Summary: A test release (seepage) occurred from H+3.3 to H+20 hours. Low-level seepage continued for approximately three days, but all significant activity had been released by H+20 hours. Effluent was primarily ^{135}Xe (80-85%), ^{85m}Kr , ^{87}Kr , ^{88}Kr , ^{131m}Xe , ^{133}Xe , and ^{133m}Xe , with trace quantities of ^{131}I , ^{132}I , ^{133}I , and ^{135}I detected. Minor levels of radioactivity were detected offsite by aircraft only.

References: (C) (E) (H) (L) (Z) (AC) (EU) (HW) (HX) (NU)

Test:	DIANTHUS		
Date:	02/17/72	Sponsor:	LLL
Time:	1102 PST	Depth of Burial:	1,000 ft
Location:	NTS U10at	Purpose:	Weapons Related
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Gas Sampling

Gas Sampling Release Activity at Time of Release, in Curies: 1.8×10^1

^{133}Xe in curies: 1.8×10^1

$^{133\text{m}}\text{Xe}$ in curies: 3.6×10^{-1}

^{135}Xe in curies: 1.1×10^{-3}

Release Summary: Releases occurred during gas sampling operations through the ventilation line beginning at 2110 hours on February 24, 1972, and lasting for 27 hours.

References: (C) (E) (H) (AC) (U9)

Test: SAPPHO

Date:	03/23/72	Sponsor:	LLL
Time:	1050 PST	Depth of Burial:	646 ft
Location:	NTS U2dh-2	Purpose:	Weapons Related
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: 8.6

^{133}Xe in curies: 8.6

$^{133\text{m}}\text{Xe}$ in curies: 3.9×10^{-2}

Release Summary: A drillback release occurred from the ventilation line at 0140 hours on April 9, 1972, and lasted for 50 minutes.

References: (C) (E) (H) (AC) (UF)

Test: KARA

Date:	05/11/72	Sponsor:	LLL
Time:	0700 PDT	Depth of Burial:	850 ft
Location:	NTS U2dh-3	Purpose:	Weapons Related
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: 6.8

^{133}Xe in curies: 6.7

$^{133\text{m}}\text{Xe}$ in curies: 7.3×10^{-2}

Release Summary: A drillback release occurred from the ventilation line at 1520 hours on May 22, 1972, and lasted for 20 minutes.

References: (C) (E) (H) (AC) (VF)

Test:	ZINNIA		
Date:	05/17/72	Sponsor:	LLL
Time:	0710 PDT	Depth of Burial:	1,059 ft
Location:	NTS U2dk	Purpose:	Weapons Related
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: 6.7

^{133}Xe in curies: 6.7

$^{133\text{m}}\text{Xe}$ in curies: 8.3×10^{-2}

Release Summary: Drillback releases occurred from the ventilation line at 0010 hours on May 26, 1972, lasting for 10 minutes, and from the gas sampling line at 0240 hours on May 28, 1972, lasting for approximately 4.2 hours.

References: (C) (E) (H) (AC) (NV)

Test:	MERIDA		
Date:	06/07/72	Sponsor:	LLL
Time:	0820 PDT	Depth of Burial:	670 ft
Location:	NTS U2dn	Purpose:	Weapons Related
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: 1.0×10^1

^{133}Xe in curies: 1.0×10^1

$^{133\text{m}}\text{Xe}$ in curies: 2.4×10^{-1}

^{135}Xe in curies: 6.5×10^{-3}

Release Summary: Intermittent drillback releases occurred from the ventilation line beginning at 2225 hours on June 13, 1972, and lasting for 20 minutes.

References: (C) (E) (H) (AC) (VG)

Test:	ATARQUE		
Date:	07/25/72	Sponsor:	LASL
Time:	0630 PDT	Depth of Burial:	964 ft
Location:	NTS U3ht	Purpose:	Weapons Related
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Cementback

Cementback Release Activity at Time of Release, in Curies: 1.2×10^{-2}

^{133}Xe in curies: 1.2×10^{-2}

^{135}Xe in curies: 8.5×10^{-7}

^{131}I in curies: 1.7×10^{-6}

^{133}I in curies: 1.4×10^{-6}

Release Summary: A release occurred during cementback operations between July 31 and August 2, 1972.

References: (B) (E) (H) (AD) (ST)

Detonation: **CEBOLLA**
(simultaneous with CUCHILLO and SOLANO, separate holes)

Date:	08/09/72	Sponsor:	LASL
Time:	0631 PDT	Depth of Burial:	941 ft
Location:	NTS U3jc	Purpose:	Weapons Related
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: 1.7×10^{-3}

^{133}Xe in curies: 1.7×10^{-3}

^{135}Xe in curies: 1.0×10^{-7}

^{131}I in curies: 2.4×10^{-7}

^{133}I in curies: 2.4×10^{-8}

Release Summary: A drillback release occurred between August 22 and August 24, 1972.

References: (B) (E) (H) (AD) (ST)

ARSENATE			
Date:	11/09/72	Sponsor:	LLL
Time:	1015 PST	Depth of Burial:	821 ft
Location:	NTS U9ci	Purpose:	Weapons Related
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Gas Sampling

Gas Sampling Activity at Time of Release, in Curies: 1.2×10^1

^{133}Xe in curies: 1.2×10^1

$^{133\text{m}}\text{Xe}$ in curies: 2.5×10^{-1}

^{135}Xe in curies: 3.6×10^{-3}

Release Summary: A release occurred from the ventilation line at 1400 hours on November 16, 1972, during a gas sampling operation and lasted for 20 minutes.

References: (C) (E) (H) (AD) (QF)

SOLANUM			
Date:	12/14/72	Sponsor:	LLL
Time:	0730 PST	Depth of Burial:	660 ft
Location:	NTS U9IW24.5	Purpose:	Weapons Related
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: 3.4×10^{-2}

^{133}Xe in curies: 5.2×10^{-3}

$^{133\text{m}}\text{Xe}$ in curies: 2.7×10^{-4}

^{135}Xe in curies: 2.9×10^{-2}

Release Summary: A drillback release occurred from the ventilation line at 1315 hours on December 16, 1972, and lasted for 20 minutes.

References: (C) (E) (H) (X) (AD) (UM)

Test:	MIERA		
Date:	03/08/73	Sponsor:	LASL
Time:	0810 PST	Depth of Burial:	1,867 ft
Location:	NTS U7ad	Purpose:	Weapons Related
Type:	Shaft	Yield:	20 to 200 kt
Release Detected:	Onsite Only	Type of Release:	Cementback

Cementback Release Activity at Time of Release, in Curies: 3.1×10^{-3}

^{133}Xe in curies: 3.1×10^{-3}

Release Summary: A release of a small amount of xenon occurred during the cementback operation.

References: (B) (E) (H) (AD) (ST) (SZ)

Test:	GAZOOK		
Date:	03/23/73	Sponsor:	LLL
Time:	1215 PST	Depth of Burial:	1,070 ft
Location:	NTS U2do	Purpose:	Weapons Related
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: 1.2×10^1

^{133}Xe in curies: 9.3

^{133m}Xe in curies: 3.9×10^{-1}

^{135}Xe in curies: 2.8

Release Summary: Two intermittent drillback releases occurred from the ventilation line on March 26, 1972, beginning at 0911 hours and lasting for 15 minutes.

References: (C) (E) (H) (AD) (VH)

Detonation:	ANGUS* (simultaneous with VELARDE)		
Date:	04/25/73	Sponsor:	LASL
Time:	1425 PST	Depth of Burial:	1,486 ft
Location:	NTS U3jg	Purpose:	Weapons Related
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: 6.1×10^{-1}

^{133}Xe in curies: 6.1×10^{-1}

iodines in curies: 1.3×10^{-3}

References: (B) (E) (H) (AD) (NW) (ST) (SZ)

Detonation:	VELARDE* (simultaneous with ANGUS)		
Date:	04/25/73	Sponsor:	LASL
Time:	1425 PST	Depth of Burial:	908 ft
Location:	NTS U3jk	Purpose:	Weapons Related
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Drillback and Cementback

Drillback and Cementback Release Activity at Time of Release, in Curies: 2.5×10^2

^{133}Xe in curies: 2.4×10^2

^{135}Xe in curies: 1.2×10^1

^{131}I in curies: 2.7×10^{-2}

^{132}I in curies: 5.2×10^{-2}

^{133}I in curies: 1.4×10^{-1}

^{135}I in curies: 1.6×10^{-2}

Release Summary: Chronic radioactive effluent releases occurred during coring and cementback operations. On April 27, 1973, above-background radiation levels were noted in the drilling rig cellar from gas trapped in the drilling pipe. Whenever the drilling pipe was open (i.e., when sections of pipe were being removed or when the stripper head was off) radioactive gas was released. By swing shift on April 27, 1973, respiratory protection was required during periods of potential release. The releases ceased after cementback of the hole on April 28, 1973.

References: (B) (E) (H) (AD) (QG) (QH) (QI) (ST) (SZ)

*ANGUS and VELARDE are one test because these detonations occurred within the time frame and proximity as defined by treaty. They are listed separately because of individual test data.

Test:	COLMOR		
Date:	04/26/73	Sponsor:	LASL
Time:	0715 PST	Depth of Burial:	806 ft
Location:	NTS U3hv	Purpose:	Weapons Related
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Cementback

Cementback Release Activity at Time of Release, in Curies: 2.9×10^{-3}

^{133}Xe in curies: 2.9×10^{-3}

^{135}Xe in curies: 4.1×10^{-8}

Release Summary: A release occurred during cementback operations on May 3, 1973.

References: (B) (E) (H) (AD) (ST) (SZ)

Test:	STARWORT		
Date:	04/26/73	Sponsor:	LLL
Time:	0915 PST	Depth of Burial:	1,850 ft
Location:	NTS U2bs	Purpose:	Weapons Related
Type:	Shaft	Yield:	90 kt
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: 9.7

^{133}Xe in curies: 9.6

$^{133\text{m}}\text{Xe}$ in curies: 1.1×10^{-1}

^{135}Xe in curies: 2.7×10^{-6}

Release Summary: A drillback release occurred from the ventilation line at 1235 hours on May 7, 1973.

References: (C) (E) (H) (AD)

Test:	MESITA		
Date:	05/09/73	Sponsor:	LASL
Time:	0630 PDT	Depth of Burial:	490 ft
Location:	NTS U3jd	Purpose:	Weapons Related
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Cementback

Cementback Release Activity at Time of Release, in Curies: 4.0×10^{-3}

^{133}Xe in curies: 4.0×10^{-3}

^{135}Xe in curies: 1.7×10^{-8}

Release Summary: A release occurred during cementback operations on May 17, 1973.

References: (B) (E) (H) (AD) (ST) (SZ)

Test:	KASHAN		
Date:	05/24/73	Sponsor:	LLL
Time:	0630 PDT	Depth of Burial:	870 ft
Location:	NTS U10av	Purpose:	Weapons Related
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: 2.7×10^2

^{133}Xe in curies: 2.6×10^2

$^{133\text{m}}\text{Xe}$ in curies: 8.2

^{135}Xe in curies: 2.4

Release Summary: A drillback release occurred from the ventilation line at 0420 hours on May 31, 1973, and lasted for 6.5 hours.

References: (C) (E) (H) (AD) (VI)

Test:	POTRILLO		
Date:	06/21/73	Sponsor:	LASL
Time:	0745 PDT	Depth of Burial:	1,865 ft
Location:	NTS U7af	Purpose:	Weapons Related
Type:	Shaft	Yield:	20 to 200 kt
Release Detected:	Onsite Only	Type of Release:	Cementback

Cementback Release Activity at Time of Release, in Curies: 2.1×10^{-4}

^{133}Xe in curies: 2.1×10^{-4}

Release Summary: A release occurred during cementback operations between July 19 and 20, 1973.

References: (E) (H) (AD) (ST) (SZ)

Test:	PORTULACA		
Date:	06/28/73	Sponsor:	LLL
Time:	1215 PDT	Depth of Burial:	1,530 ft
Location:	NTS U2bv	Purpose:	Weapons Related
Type:	Shaft	Yield:	20 to 200 kt
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release: Some

Release Summary: There was no release of radioactivity through the ventilation line system. A small undocumented release was detected from the drill casing after the rig was removed on July 6, 1973, at 2130 hours.

References: (E) (H) (X) (AD) (LI)

Test:	WALLER		
Date:	10/02/73	Sponsor:	LLL
Time:	0815 PDT	Depth of Burial:	1,017 ft
Location:	NTS U2bz	Purpose:	Weapons Related
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Drillback and Gas Sampling

Drillback Release Activity at Time of Release, in Curies: 3.0

^{133}Xe in curies: 1.9

$^{133\text{m}}\text{Xe}$ in curies: 7.4×10^{-1}

^{135}Xe in curies: 3.1×10^{-1}

Gas Sampling Release Activity at R+12 hours in Curies: 6.0×10^{-3}

Release Summary: Drillback releases occurred from the ventilation line at 1045 hours on October 5, 1973, lasting for seven minutes and at 1846 hours on October 5, 1973, lasting for eight minutes.

Two uncontrolled releases occurred from the gas sampling skid on October 5, 1973.

References: (C) (E) (H) (X) (AE) (Q3)

Test: BERNAL

Date: 11/28/73 **Sponsor:** LASL

Time: 0730 PST **Depth of Burial:** 928 ft

Location: NTS U3jy **Purpose:** Weapons Related

Type: Shaft **Yield:** Less than 20 kt

Release Detected: Onsite Only **Type of Release:** Cementback

Cementback Release Activity at Time of Release, in Curies: 1.4×10^{-1}

^{133}Xe in curies: 1.4×10^{-1}

Release Summary: A release occurred January 16, 1974, during postshot cementing operations.

References: (E) (H) (AE) (RA) (ST) (SX)

Test: PAJARA

Date: 12/12/73 **Sponsor:** LASL

Time: 1100 PST **Depth of Burial:** 912 ft

Location: NTS U3ji **Purpose:** Weapons Related

Type: Shaft **Yield:** Less than 20 kt

Release Detected: Onsite Only **Type of Release:** Cementback

Drillback Release Activity at Time of Release, in Curies: 5.3

^{133}Xe in curies: 5.3

Release Summary: A release occurred during cementback operations between January 11 and 14, 1974.

References: (E) (H) (AE) (ST) (SX)

Test:	SEAFOAM		
Date:	12/13/73	Sponsor:	LLL
Time:	0717 PST	Depth of Burial:	650 ft
Location:	NTS U2ea	Purpose:	Weapons Related
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Gas Sampling

Gas Sampling Release Activity in Curies: 4.5

Release Summary: A release occurred from the prompt gas sampling line at 0737 hours on December 13, 1973, and lasted for 14 minutes.

References: (C) (E) (H) (AE) (QJ)

Test:	ELIDA		
Date:	12/19/73	Sponsor:	LASL
Time:	1116 PST	Depth of Burial:	1,250 ft
Location:	NTS U3hy	Purpose:	Weapons Related
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Cementback

Cementback Release Activity at Time of Release, in Curies: 7.9×10^{-1}

^{133}Xe in curies: 7.9×10^{-1}

Release Summary: A cementback release occurred between January 8 and 9, 1974.

References: (E) (H) (AE) (ST) (SX)

Detonation:	PINEDROPS-BAYOU (simultaneous with PINEDROPS-SLOAT and -TAWNY, same hole)		
Date:	01/10/74	Sponsor:	LLL
Time:	0838 PDT	Depth of Burial:	1,125 ft
Location:	NTS U10as	Purpose:	Weapons Related
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: 6.0

^{133}Xe in curies: 2.5

$^{133\text{m}}\text{Xe}$ in curies: 1.2×10^{-1}

^{135}Xe in curies: 3.4

Release Summary: Drillback releases occurred from the ventilation line at 0729 hours on January 12, 1974, lasting for 31 minutes, and at 0700 hours on January 13, 1974, lasting for six minutes.

References: (C) (E) (H) (AE) (QK)

Test:	HULSEA		
Date:	03/14/74	Sponsor:	LLL
Time:	1000 PDT	Depth of Burial:	640 ft
Location:	NTS U2bx	Purpose:	Weapons Related
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: 6.7×10^1

^{133}Xe in curies: 3.9×10^1

$^{133\text{m}}\text{Xe}$ in curies: 1.6

^{135}Xe in curies: 2.6×10^1

Release Summary: A drillback release occurred at 0900 hours on March 16, 1974, and lasted for 49 hours.

References: (C) (E) (H) (AE) (QL)

GROVE

Test:	GROVE		
Date:	05/22/74	Sponsor:	LLL
Time:	0715 PDT	Depth of Burial:	1,027 ft
Location:	NTS U2ds	Purpose:	Weapons Related
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: 2.6×10^1

^{133}Xe in curies: 2.5×10^1

$^{133\text{m}}\text{Xe}$ in curies: 6.3×10^{-1}

^{135}Xe in curies: 4.7×10^{-2}

Release Summary: A drillback release occurred from the ventilation line at 1040 hours on May 26, 1974, lasting for three minutes, and at 1549 hours on May 28, 1974, lasting for 14.5 minutes.

References: (C) (E) (H) (AE) (QM)

FALON

Test:	FALON		
Date:	05/23/74	Sponsor:	LLL/UK
Time:	0638 PDT	Depth of Burial:	1,529 ft
Location:	NTS U2dv	Purpose:	Joint US-UK
Type:	Shaft	Yield:	20 to 200 kt
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: 7.2×10^1

^{133}Xe in curies: 7.0×10^1

$^{133\text{m}}\text{Xe}$ in curies: 1.8

^{135}Xe in curies: 1.1×10^{-1}

Release Summary: Drillback releases occurred from the ventilation line as follows: (1) at 0525 hours on May 29, 1974, lasting for 22 minutes; (2) at 0636 hours on May 29, 1974, lasting for 17 minutes; (3) at 0703 hours on May 29, 1974, lasting for 10 minutes; (4) at 0743 hours on May 29, 1974, lasting for 12 minutes; (5) at 0835 hours on May 29, 1974, lasting for 10 minutes; (6) at 1324 hours on May 29, 1974, lasting for 12 minutes; and (7) at 0547 hours on May 30, 1974, lasting for 7 minutes.

References: (C) (E) (H) (AE) (NX)

Test:	JARA		
Date:	06/06/74	Sponsor:	LASL
Time:	0740 PDT	Depth of Burial:	1,240 ft
Location:	NTS U3hp	Purpose:	Weapons Related
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Cementback

Cementback Release Activity at Time of Release, in Curies: 2.6×10^{-4}

^{133}Xe in curies: 2.6×10^{-4}

Release Summary: A cementback release occurred through the filtering system on July 1 and 2, 1974.

References: (E) (H) (AE) (ST) (SX)

Test:	ES CABOSA		
Date:	07/10/74	Sponsor:	LASL
Time:	0900 PDT	Depth of Burial:	2,100 ft
Location:	NTS U7ac	Purpose:	Weapons Related
Type:	Shaft	Yield:	20 to 200 kt
Release Detected:	Onsite Only	Type of Release:	Cementback

Cementback Release Activity at Time of Release, in Curies: 5.3×10^{-4}

^{133}Xe in curies: 5.3×10^{-4}

Release Summary: A cementback release occurred from the postshot drilling hole from July 31, to August 1, 1974.

References: (E) (H) (AF) (RB) (ST) (SX)

Detonations:	CRESTLAKE-TANSAN, -BRIAR		
	(simultaneous, same hole)		
Date:	07/18/74	Sponsor:	LLL
Time:	0700 PDT	Depth of Burial:	892 ft; 1,229 ft
Location:	NTS U2dw	Purpose:	Weapons Related
Type:	Shaft	Yield:	Less than 20 kt (each)
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: 1.9×10^1

^{133}Xe in curies: 1.6×10^1

$^{133\text{m}}\text{Xe}$ in curies: 6.4×10^{-1}

^{135}Xe in curies: 2.3

Release Summary: A drillback release occurred from the ventilation line at 1630 hours on July 21, 1974, and lasted for 3.5 hours.

References: (C) (E) (H) (X) (AF) (QN)

Test:	PUYE		
Date:	08/14/74	Sponsor:	LASL
Time:	0700 PDT	Depth of Burial:	1,411 ft
Location:	NTS U3jl	Purpose:	Weapons Related
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Drillback and Cementback

Drillback Release Activity at Time of Release, in Curies: 1.5×10^{-2}

^{133}Xe in curies: 1.5×10^{-2}

^{135}Xe in curies: 2.1×10^{-4}

^{131}I in curies: 2.1×10^{-6}

^{133}I in curies: 8.6×10^{-7}

^{135}I in curies: 2.5×10^{-9}

Cementback Release Activity at Time of Release, in Curies: 3.7

^{133}Xe in curies: 3.7

Release Summary: A drillback release occurred on August 21, 1974, from the postshot drilling hole, and a cementback release occurred from September 11-12, 1974, from the same drilling hole.

References: (E) (H) (Y) (AF) (RC) (RD) (ST) (SX)

Test:	HYBLA FAIR		
Date:	10/28/74	Sponsor:	DoD/LLL
Time:	0700 PST	Depth of Burial:	1,325 ft
Location:	NTS U12n.09	Purpose:	Weapons Effects
Type:	Tunnel	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Controlled

Controlled Release Activity at Time of Release, in Curies: 5.0×10^2

Controlled Release Activity at R+12 Hours, in Curies: 5.0×10^2

Isotopes Detected in Release: ^{133}Xe and $^{133\text{m}}\text{Xe}$

Release Summary: A release occurred from the area between overburden plug (OBP) No. 1 and OBP No. 2 from November 13 to November 14, 1974. Stemming failed during the test and noble gases seeped through or around OBP No. 2. All activity was successfully contained inside OBP No. 1. Effluent released during the controlled ventilation of the tunnel complex was the activity contained between OBP No. 1 and OBP No. 2 only. Activity was 99% ^{133}Xe , with the remainder of activity being $^{133\text{m}}\text{Xe}$. A second release occurred from the U12n.09 drift complex from November 20, 1974, to January 6, 1975. Activity released was passed through a high-efficiency particulate and aerosol filter before being released through the tunnel ventilation system. Effluent was 99% ^{133}Xe with some $^{133\text{m}}\text{Xe}$.

References: (E) (H) (L) (AF)

Test:	TEMESCAL		
Date:	11/02/74	Sponsor:	LLL
Time:	0730 PST	Depth of Burial:	859 ft
Location:	NTS U4ab	Purpose:	Weapons Related
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Gas Sampling

Gas Sampling Release Activity at R+12 Hours, in Curies: 1.6

^{133}Xe in curies: 1.0

$^{133\text{m}}\text{Xe}$ in curies: 4.0×10^{-2}

^{135}Xe in curies: 1.2×10^{-1}

^3H in curies: 4.0×10^{-1}

^{131}I in curies: 4.0×10^{-3}

Release Summary: A gas sampling release occurred at 0800 hours on November 2, 1974, through the in-line filter in the sampling skid. A second release occurred on November 6, 1974, through a hydrogen analyzer.

References: (C) (E) (H) (AF) (QP)

Detonations:	PORTOLA, PORTOLA-LARKIN (simultaneous, same hole)		
Date:	02/06/75	Sponsor:	LLL
Time:	0730 PST	Depth of Burial:	649 ft, 899 ft
Location:	NTS U10bb	Purpose:	Weapons Related
Type:	Shaft	Yield:	Less than 20 kt (each)
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: 9.7

^{133}Xe in curies: 9.6

$^{133\text{m}}\text{Xe}$ in curies: 1.1×10^{-1}

^{135}Xe in curies: 1.5×10^{-5}

Release Summary: Four documented releases from the ventilation line occurred on February 17, 1975, as follows: (1) starting at 0312 hours and lasting for nine minutes; (2) starting at 0422 hours and lasting for six minutes; (3) starting at 0449 hours and lasting for ten minutes; and (4) starting at 0526 hours and lasting for seven minutes.

References: (C) (E) (H) (AF) (QQ)

Test:	BILGE		
Date:	02/19/75	Sponsor:	LASL
Time:	1110 PST	Depth of Burial:	1,046 ft
Location:	NTS U3kc	Purpose:	Weapons Related
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Cementback

Cementback Release Activity at Time of Release, in Curies: 9.1×10^{-4}

^{133}Xe in curies: 9.1×10^{-4}

Release Summary: A release occurred during cementback operations between 1830 and 1940 hours on April 16, 1975.

References: (E) (H) (AF) (QI) (QR) (TA) (TB)

Test:	CABRILLO		
Date:	03/07/75	Sponsor:	LLL
Time:	0800 PDT	Depth of Burial:	1,969 ft
Location:	NTS U2dr	Purpose:	Weapons Related
Type:	Shaft	Yield:	20 to 200 kt
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: 1.1×10^1

^{133}Xe in curies: 1.1×10^1

$^{133\text{m}}\text{Xe}$ in curies: 2.2×10^{-1}

^{135}Xe in curies: 1.8×10^{-3}

Release Summary: Three drillback releases occurred from the ventilation line beginning at 1057 hours on March 15, 1975, and continued over a 46-minute period.

References: (C) (E) (H) (AF) (NZ)

Test:	KASSERI		
Date:	10/28/75	Sponsor:	LLL
Time:	0630 PST	Depth of Burial:	4,150 ft
Location:	NTS U20z	Purpose:	Weapons Related
Type:	Shaft	Yield:	200 to 1000 kt
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: 2.4×10^{-2}

^{133}Xe in curies: 2.4×10^{-2}

Release Summary: Three releases occurred from the drilling platform as follows: (1) on November 24, 1975, for 25 seconds; (2) on November 30, 1975, for 28 minutes; and (3) on December 3, 1975, for 6.3 hours.

References: (C) (E) (H) (X) (AG)

Test:	ESROM		
Date:	02/04/76	Sponsor:	LLL
Time:	0640 PST	Depth of Burial:	2,149 ft
Location:	NTS U7ak	Purpose:	Weapons Related
Type:	Shaft	Yield:	20 to 200 kt
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: 8.8×10^1

^{133}Xe in curies: 8.8×10^1

$^{133\text{m}}\text{Xe}$ in curies: 1.0×10^{-1}

^{135}Xe in curies: 1.1×10^{-14} (trace)

Release Summary: Two releases occurred through the ventilation line between 1910 and 2220 hours on February 28, 1976.

References: (C) (E) (H) (X) (AG) (L2)

Test:	SHALLOWS		
Date:	02/26/76	Sponsor:	LASL
Time:	0650 PST	Depth of Burial:	800 ft
Location:	NTS U3jf	Purpose:	Weapons Related
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Cementback

Cementback Release Activity at Time of Release, in Curies: 1.7×10^{-2}

^{133}Xe in curies: 1.7×10^{-2}

Release Summary: A cementback release occurred through the filtering system between 2230 and 2330 hours on March 11, 1976.

References: (E) (H) (AG) (QI) (QS) (SY) (TC) (TE)

Test:	COLBY		
Date:	03/14/76	Sponsor:	LLL
Time:	0430 PST	Depth of Burial:	4,178 ft
Location:	NTS U20aa	Purpose:	Weapons Related
Type:	Shaft	Yield:	500 to 1000 kt
Release Detected:	Onsite Only	Type of Release:	Mudpit

Cementback Release Activity at Time of Release, in Curies: 4.4×10^1

^{103}Ru in curies: 3.8×10^1

$^{106}\text{Ru}/^{106}\text{Rh}$ in curies: 6.0

Release Summary: Overflow effluent from the mudpit occurred at 1625 hours on May 16, 1976, and flowed for 0.47 miles. Effluent was buried in the crater.

References: (C) (E) (H) (X) (AG) (CP)

Test:	RIVOLI		
Date:	05/20/76	Sponsor:	LLL
Time:	1030 PDT	Depth of Burial:	656 ft
Location:	NTS U2eg	Purpose:	Weapons Related
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Test

Test Release Activity at R+12 Hours: Trace

^{135}Xe : trace

Release Summary: A trace of ^{135}Xe , released from surface ground zero, was detected on an M-102 air sampler at H+2.5 hours. This release lasted for one day.

References: (C) (E) (H) (X) (AH) (QT)

Test:	BILLET		
Date:	07/27/76	Sponsor:	LASL
Time:	1330 PDT	Depth of Burial:	2,087 ft
Location:	NTS U7an	Purpose:	Weapons Related
Type:	Shaft	Yield:	20 to 150 kt
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: 8.0×10^{-3}

^{133}Xe in curies: 8.0×10^{-3}

References: (E) (H) (AG) (RE) (SY)

Test:	BANON		
Date:	08/26/76	Sponsor:	LLL/UK
Time:	0730 PDT	Depth of Burial:	1,759 ft
Location:	NTS U2dz	Purpose:	Joint US-UK
Type:	Shaft	Yield:	20 to 150 kt
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: 6.0

^{133}Xe in curies: 5.8

$^{133\text{m}}\text{Xe}$ in curies: 1.6×10^{-1}

^{135}Xe in curies: 3.5×10^{-2}

Release Summary: Drillback releases occurred from the ventilation line as follows: (1) at 0854 hours on August 31, 1976, lasting for nine minutes; (2) at 0955 hours on August 31, 1976, lasting for three minutes; (3) at 1256 hours on August 31, 1976, lasting for two minutes; and (4) at 1446 hours on September 2, 1976, lasting for two minutes.

References: (C) (E) (H) (AG) (O9)

Detonations:	DOFINO, DOFINO-LAWTON (simultaneous, same hole)		
Date:	03/08/77	Sponsor:	LLL
Time:	0624 PST	Depth of Burial:	600 ft, 925 ft
Location:	NTS U10ba	Purpose:	Weapons Related
Type:	Shaft	Yield:	Less than 20 kt (each)
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: 2.5×10^{-1}

^{133}Xe in curies: 2.4×10^{-1}

$^{133\text{m}}\text{Xe}$ in curies: 5.7×10^{-1}

^{135}Xe in curies: 1.5×10^{-1}

Release Summary: Drillback releases occurred from the ventilation line as follows: (1) on March 12, 1977, beginning at 1503 hours and lasting for eight minutes; (2) on March 15, 1977,

beginning at 1509 hours and lasting for four minutes; and (3) on March 15, 1977, beginning at 2000 hours and lasting for 28 minutes.

References: (C) (E) (H) (X) (AH) (QU)

Test:	MARSILLY		
Date:	04/05/77	Sponsor:	LLL
Time:	0700 PST	Depth of Burial:	2,264 ft
Location:	NTS U2el	Purpose:	Weapons Related
Type:	Shaft	Yield:	20 to 150 kt
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: 1.5×10^1

^{133}Xe in curies: 1.5×10^1

$^{133\text{m}}\text{Xe}$ in curies: 3.4×10^{-1}

^{135}Xe in curies: 1.0×10^{-2}

Release Summary: A drillback release occurred from the ventilation line on April 10, 1977, and lasted for eight minutes.

References: (C) (E) (H) (AH) (OE)

Test:	CARNELIAN		
Date:	07/28/77	Sponsor:	LLL
Time:	0707 PDT	Depth of Burial:	682 ft
Location:	NTS U4af	Purpose:	Weapons Related
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: 6.8

^{133}Xe in curies: 4.7

$^{133\text{m}}\text{Xe}$ in curies: 2.1×10^{-1}

^{135}Xe in curies: 1.9

Release Summary: A release occurred through the ventilation line on July 31, 1977, at 0001 hours and lasted for 11 minutes.

References: (C) (E) (H) (X) (AH) (QV)

Detonation:	GRUYERE-GRADINO (simultaneous with GRUYERE, same hole)		
Date:	08/16/77	Sponsor:	LLL
Time:	0741 PDT	Depth of Burial:	1,050 ft
Location:	NTS U9cg	Purpose:	Weapons Related
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at R+12 Hours*, in Curies: 8.0×10^{-1}

^{133}Xe in curies: 7.8×10^{-1}

$^{133\text{m}}\text{Xe}$ in curies: 2.2×10^{-2}

^{135}Xe in curies: 3.2×10^{-3}

Release Summary: A drillback release occurred from the ventilation line at 0814 hours on August 21, 1977, and lasted for eight minutes.

References: (E) (H) (AH) (QW) (QX)

*Release activity at time of release is not available.

Test:	FLOTOST		
Date:	08/16/77	Sponsor:	LLL
Time:	0849 PDT	Depth of Burial:	902 ft
Location:	NTS U2ao	Purpose:	Weapons Related
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: 2.5

^{133}Xe in curies: 2.5

$^{133\text{m}}\text{Xe}$ in curies: 4.0×10^{-2}

^{135}Xe in curies: 3.0×10^{-5}

Release Summary: A release occurred from the ventilation line August 25, 1977, and lasted for two minutes.

References: (E) (H) (X) (AH) (QY)

Test:	COULOMMIERS		
Date:	09/27/77	Sponsor:	LLL
Time:	0700 PDT	Depth of Burial:	1,739 ft
Location:	NTS U2ei	Purpose:	Weapons Related
Type:	Shaft	Yield:	20 to 150 kt
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: 9.3×10^{-1}

^{133}Xe in curies: 9.1×10^{-1}

$^{133\text{m}}\text{Xe}$ in curies: 2.0×10^{-2}

^{135}Xe in curies: 3.9×10^{-4}

Release Summary: A drillback release occurred from the ventilation line at 0707 hours on October 3, 1977, and lasted for three minutes.

References: (C)(E) (H) (AH) (O0)

Test:	BOBSTAY		
Date:	10/26/77	Sponsor:	LASL
Time:	0715 PDT	Depth of Burial:	1,250 ft
Location:	NTS U3jb	Purpose:	Weapons Related
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Cementback

Cementback Release Activity at Time of Release, in Curies: 2.0×10^{-3}

^{133}Xe in curies: 2.0×10^{-3}

^{131}I in curies: 2.6×10^{-6}

References: (E) (H) (AI) (RF) (SU) (SW)

HYBLA GOLD

Date:	11/01/77	Sponsor:	DoD/LASL
Time:	1006 PST	Depth of Burial:	1,263 ft
Location:	NTS U12e.20	Purpose:	Weapons Effects
Type:	Tunnel	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Controlled

Controlled Release Activity at Time of Release, in Curies: 5.0×10^{-3}

Controlled Release Activity at R+12 Hours, in Curies: 5.0×10^{-3}

Isotopes Detected in Release: ^{133}Xe

Release Summary: Activity was successfully contained inside the drift protection plug (DPP) until it had decayed to an insignificant level. A controlled release occurred on November 29, 1977.

References: (E) (H) (L) (AI)

FARALLONES

Date:	12/14/77	Sponsor:	LLL
Time:	0730 PST	Depth of Burial:	2,192 ft
Location:	NTS U2fa	Purpose:	Weapons Related
Type:	Shaft	Yield:	20 to 150 kt
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: 1.2

^{133}Xe in curies: 1.1

$^{133\text{m}}\text{Xe}$ in curies: 3.6×10^{-2}

^{135}Xe in curies: 1.2×10^{-2}

Release Summary: A drillback release occurred from the drilling rig cellar. Xenon releases occurred through the filtering system at 0205 hours on December 19, 1977, and lasted approximately 10 minutes.

References: (E) (H) (AI) (O1)

Test:	CAMPOS		
Date:	02/13/78	Sponsor:	LLL
Time:	1353 PST	Depth of Burial:	1,050 ft
Location:	NTS U9cp	Purpose:	Weapons Related
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: 1.3×10^3

^{133}Xe in curies: 1.3×10^3

$^{133\text{m}}\text{Xe}$ in curies: 1.1×10^{-1}

^{135}Xe in curies: 1.5×10^{-2}

^{131}I in curies: 2.6×10^{-5}

Release Summary: Drillback releases occurred from the ventilation line at 0223 hours on February 19, 1978, lasting for 30 minutes, and from the mud line "kill" valve at approximately 1200 hours on February 26, 1978, lasting for approximately 22 hours.

References: (C) (E) (H) (X) (AI)

Test:	REBLOCHON		
Date:	02/23/78	Sponsor:	LLL
Time:	0900 PST	Depth of Burial:	2,160 ft
Location:	NTS U2en	Purpose:	Weapons Related
Type:	Shaft	Yield:	20 to 150 kt
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: 3.6×10^1

^{133}Xe in curies: 3.5×10^1

$^{133\text{m}}\text{Xe}$ in curies: 1.1

^{135}Xe in curies: 3.6×10^{-1}

Release Summary: At 0645 hours on February 28, 1978, 15 mR/h was detected in the rig cellar. By 0650 hours, the cellar radiation level had increased to greater than 500 mR/h. The Hydril (part of the blow-out prevention system) was closed to contain the release. The activity from this release totalled 33 curies. A second release of 0.56 curies was detected at 1015 hours the same day. Shortly after the rotating head (part of the drilling system) was removed, a third release of 3.1 curies occurred at 1045 hours.

References: (C) (E) (H) (AI) (O2)

Test:	KARAB		
Date:	03/16/78	Sponsor:	LLL
Time:	0700 PST	Depth of Burial:	1,086 ft
Location:	NTS U4ah	Purpose:	Weapons Related
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: 7.3×10^{-5}

^{133}Xe in curies: 7.0×10^{-5}

$^{133\text{m}}\text{Xe}$ in curies: 2.2×10^{-6}

^{135}Xe in curies: 7.0×10^{-7}

^{131}I in curies: 7.0×10^{-8}

Release Summary: A drillback release occurred from the gas sampling line on March 20, 1978, lasting for five minutes.

References: (E) (H) (AI) (QZ)

Test:	SATZ		
Date:	07/07/78	Sponsor:	LLL
Time:	0700 PDT	Depth of Burial:	1,033 ft
Location:	NTS U2dq	Purpose:	Weapons Related
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Gas Sampling

Gas Sampling Release Activity at Time of Release, in Curies: 1.8×10^{-4}

^3H in curies: 1.7×10^{-4}

^{85}Kr in curies: 6.0×10^{-6}

Release Summary: A controlled gas sampling containment tank release occurred on October 26, 1982.

References: (C) (E) (H) (X) (AI)

Test:	QUARGEL		
Date:	11/18/78	Sponsor:	LLL/UK
Time:	1100 PST	Depth of Burial:	1,778 ft
Location:	NTS U2fb	Purpose:	Joint US-UK
Type:	Shaft	Yield:	20 to 150 kt
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at R+12 Hours*, in Curies: 6.7

^{133}Xe in curies: 6.5

$^{133\text{m}}\text{Xe}$ in curies: 1.6×10^{-1}

^{135}Xe in curies: 9.0×10^{-3}

Release Summary: A drillback release occurred from the ventilation line at 1528 hours on November 24, 1978, and lasted for nine minutes.

References: (C) (E) (H) (X) (AJ) (O3)

*Drillback release activity at the time of release is not available.

Test:	FARM		
Date:	12/16/78	Sponsor:	LLL
Time:	0730 PST	Depth of Burial:	2,260 ft
Location:	NTS U20ab	Purpose:	Weapons Related
Type:	Shaft	Yield:	20 to 150 kt
Release Detected:	Onsite Only	Type of Release:	Gas Sampling

Gas Sampling Release Activity at Time of Release, in Curies: 3.0×10^{-3}

^3H in curies: 2.9×10^{-5}

^{85}Kr in curies: 3.0×10^{-3}

Release Summary: A controlled gas sampling containment tank release occurred on October 18, 1982.

References: (C) (E) (H) (X) (AJ)

KLOSTER

Date:	02/15/79	Sponsor:	LLL
Time:	1005 PST	Depth of Burial:	1,759 ft
Location:	NTS U2eo	Purpose:	Weapons Related
Type:	Shaft	Yield:	20 to 150 kt
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: Less than 2.0×10^{-2}

Release Summary: A drillback release occurred from the drill string at 1315 hours on February 21, 1979. Nine puffs of radioactive gases were released over a 30-hour period from this location.

References: (C) (E) (H) (X) (AJ) (O4)**PEPATO**

Date:	06/11/79	Sponsor:	LLL
Time:	0700 PDT	Depth of Burial:	2,233 ft
Location:	NTS U20ad	Purpose:	Weapons Related
Type:	Shaft	Yield:	20 to 150 kt
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: Less than 1.0×10^{-2}

Release Summary: Drillback releases occurred from the Hydril from 0505 to 0750 hours on June 22, 1979. There were a small number of intermittent releases for a total of 18 minutes when the Hydril was open.

References: (C) (E) (H) (X) (AJ) (CZ)**FAJY**

Date:	06/28/79	Sponsor:	LLL
Time:	0744 PDT	Depth of Burial:	1,759 ft
Location:	NTS U2fc	Purpose:	Weapons Related
Type:	Shaft	Yield:	20 to 150 kt
Release Detected:	Onsite Only	Type of Release:	Drillback and Gas Sampling

Drillback Release Activity at Time of Release, in Curies: Less than 1.0×10^{-2} **Gas Sampling Release Activity at Time of Release, in Curies: 3.0×10^{-4}**

Release Summary: Two drillback releases occurred from the open drill pipe on July 3, 1979. Two short-duration releases occurred when replacing the drill string.

A controlled gas sampling containment tank release occurred on October 26, 1982.

References: (C) (E) (H) (X) (AJ)

Test:	BURZET		
Date:	08/03/79	Sponsor:	LLL
Time:	0807 PDT	Depth of Burial:	1,476 ft
Location:	NTS U4ai	Purpose:	Weapons Related
Type:	Shaft	Yield:	20 to 150 kt
Release Detected:	Onsite Only	Type of Release:	Gas Sampling

Gas Sampling Release Activity at Time of Release, in Curies: 3.0×10^{-2}

^{3}H in curies: 3.0×10^{-2}

^{85}Kr in curies: 2.3×10^{-5}

Release Summary: A controlled gas sampling containment tank release occurred on December 14, 1982.

References: (C) (E) (H) (X) (AJ)

Test:	NESSEL		
Date:	08/29/79	Sponsor:	LLL/UK
Time:	0808 PDT	Depth of Burial:	1,522 ft
Location:	NTS U2ep	Purpose:	Joint US-UK
Type:	Shaft	Yield:	20 to 150 kt
Release Detected:	Onsite Only	Type of Release:	Gas Sampling

Gas Sampling Release Activity at Time of Release, in Curies: 2.3×10^{-2}

^{3}H in curies: 2.3×10^{-2}

Release Summary: A controlled gas sampling containment tank release occurred on December 13, 1982.

References: (C) (E) (H) (X) (AJ)

Test:	TARKO		
Date:	02/21/80	Sponsor:	LLL
Time:	0700 PST	Depth of Burial:	1,211 ft
Location:	NTS U2fd	Purpose:	Weapons Related
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Drillback and Gas Sampling

Drillback Release Activity at Time of Release, in Curies: 5.0×10^1

^{133}Xe in curies: 4.3×10^1

$^{133\text{m}}\text{Xe}$ in curies: 1.7

^{135}Xe in curies: 5.2

Gas Sampling Release Activity at Time of Release, in Curies: 4.6×10^{-2}

^3H in curies: 4.5×10^{-2}

^{85}Kr in curies: 5.6×10^{-4}

Release Summary: A drillback release occurred from the postshot drill hole at 2018 hours on March 2, 1980, lasting for 20 minutes.

A controlled gas sampling containment tank release occurred on December 13, 1982.

References: (E) (H) (AK) (C) (C0) (O5) (RG)

Test:	NORBO		
Date:	03/08/80	Sponsor:	LLNL
Time:	0735 PST	Depth of Burial:	889 ft
Location:	NTS U8c	Purpose:	Weapons Related
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Test and Gas Sampling

Test Release at Time of Release, in Curies: 5.0×10^{-2}

Gas Sampling Release Activity at Time of Release, in Curies: 1.6×10^{-2}

^3H in curies: 1.5×10^{-2}

^{85}Kr in curies: 6.8×10^{-4}

Release Summary: A test release from the gas sampling system occurred at H+23 minutes and lasted for 18 minutes.

A controlled gas sampling containment tank release occurred on December 6, 1982.

References: (E) (H) (X) (AK) (C0)

Test:	COLWICK		
Date:	04/26/80	Sponsor:	LLNL/UK
Time:	0900 PST	Depth of Burial:	2,077 ft
Location:	NTS U20ac	Purpose:	Joint US-UK
Type:	Shaft	Yield:	20 to 150 kt
Release Detected:	Onsite Only	Type of Release:	Gas Sampling

Gas Sampling Release Activity at Time of Release, in Curies: 7.5×10^{-3}

^{3}H in curies: 1.4×10^{-5}

^{85}Kr in curies: 7.5×10^{-3}

Release Summary: A controlled gas sampling containment tank release occurred on October 18, 1982.

References: (E) (H) (X) (AK) (C0)

Test:	FLORA		
Date:	05/22/80	Sponsor:	LASL
Time:	0600 PDT	Depth of Burial:	1,099 ft
Location:	NTS U31g	Purpose:	Weapons Related
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: 1.0×10^{-3}

^{133}Xe in curies: 1.0×10^{-3}

^{131}I in curies: 1.0

Release Summary: A release occurred during dismantling of postshot drilling equipment on August 5, 1980.

References: (E) (H) (AK) (RH)

Test:	KASH		
Date:	06/12/80	Sponsor:	LLNL
Time:	1015 PDT	Depth of Burial:	2,116 ft
Location:	NTS U20af	Purpose:	Weapons Related
Type:	Shaft	Yield:	20 to 150 kt
Release Detected:	Onsite Only	Type of Release:	Gas Sampling

Gas Sampling Release Activity at Time of Release, in Curies: 2.3×10^{-4}

^3H in curies: 2.4×10^{-6}

^{85}Kr in curies: 2.3×10^{-4}

Release Summary: A controlled gas sampling containment tank release occurred on October 18, 1982.

References: (E) (H) (X) (AK) (C0)

Test:	TAFI		
Date:	07/25/80	Sponsor:	LLNL
Time:	1205 PST	Depth of Burial:	2,231 ft
Location:	NTS U20ae	Purpose:	Weapons Related
Type:	Shaft	Yield:	20 to 150 kt
Release Detected:	Onsite Only	Type of Release:	Gas Sampling

Gas Sampling Release Activity at Time of Release, in Curies: 1.6×10^{-3}

^3H in curies: 9.8×10^{-5}

^{85}Kr in curies: 1.5×10^{-3}

Release Summary: A controlled gas sampling containment tank release occurred on October 18, 1982.

References: (E) (H) (X) (AK) (C0)

Test:	VERDELLO		
Date:	07/31/80	Sponsor:	LASL
Time:	1119 PDT	Depth of Burial:	1,200 ft
Location:	NTS U3ku	Purpose:	Weapons Related
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Drillback and Cementback

Drillback and Cementback Release Activity at Time of Release, in Curies: 4.5×10^1

^{133}Xe in curies: 4.5×10^1

^{131}I in curies: 7.0×10^{-3}

Release Summary: A release occurred between August 15 and 22, 1980, during postshot drilling and cementing operations.

References: (E) (H) (AK) (RI)

Test:	RIOLA		
Date:	09/25/80	Sponsor:	LLNL
Time:	0826 PDT	Depth of Burial:	1,391 ft
Location:	NTS U2eq	Purpose:	Weapons Related
Type:	Shaft	Yield:	1.07 kt
Release Detected:	Offsite (Test Only)	Type of Release:	Test, Seepage, and Gas Sampling

Test Release at R+12 Hours, in Curies: 9.6×10^2 (mixed fission products)

Natural Seepage at Time of Release, in Curies: 2.2×10^3 (tritium and tritiated water)

Isotopes Identified in the Release: $^{85\text{m}}\text{Kr}$, ^{87}Kr , ^{88}Kr , ^{133}Xe , $^{133\text{m}}\text{Xe}$, ^{135}Xe , $^{135\text{m}}\text{Xe}$, tritium, and tritiated water

Maximum Activity Detected in Air Offsite: 34 picocuries of ^{133}Xe per cubic meter of air and 360 picocuries of ^{135}Xe per cubic meter of air at Lathrop Wells, Nevada

Maximum Gamma Exposure Rate Detected Offsite: No radiation intensities above background levels were measured.

Maximum Iodine Level Detected Offsite: No iodines were detected in any samples.

Maximum Distance Radiation Detected Offsite: No radiation intensities above background levels were measured.

Gas Sampling Release at Time of Release, in Curies: 9.8

^3H in curies: 9.8

^{85}Kr in curies: 1.5×10^{-4}

Release Summary: A test release and seepage from the surface ground zero area occurred at H+10 hours and 59 minutes. The test release, consisting of xenons and kryptons, occurred through surface ground zero cracks and lasted until 1020 hours on September 26, 1980. Seepage continued until it was no longer positively quantified in March 1981. The seepage rate varied throughout the period as it was affected by atmospheric pressure changes.

A controlled gas sampling containment tank release occurred on December 6, 1982.

References: (E) (H) (I) (X) (Z) (AK) (C0) (HY) (RJ)

Test: MINERS IRON

Date:	10/31/80	Sponsor:	DoD/LASL
Time:	1000 PST	Depth of Burial:	1,280 ft
Location:	NTS U12n.11	Purpose:	Weapons Effects
Type:	Tunnel	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Controlled

Controlled Release Activity at time of Release, in Curies: 3.0×10^{-1}

Controlled Release Activity at R+12 Hours, in Curies: 1.0×10^{-1}

Isotopes Detected in Release: $^{133\text{m}}\text{Xe}$ and ^{135}Xe

Release Summary: A controlled release occurred from H+49.5 hours until H+67 hours. Prior to that time, seepage from the stemming area into the open part of the LOS pipe had occurred. The effluent was 87% ^{135}Xe and 13% $^{133\text{m}}\text{Xe}$. The activity was contained within the LOS pipe until controlled ventilation of the LOS pipe was established. The release point was the N Tunnel mesa vent hole.

References: (E) (H) (L) (AL) (RK)

Test: VIDE

Date:	04/30/81	Sponsor:	LLNL
Time:	0735 PDT	Depth of Burial:	1,060 ft
Location:	NTS U8k	Purpose:	Weapons Related
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Gas Sampling

Gas Sampling Release Activity at Time of Release, in Curies: 2.6

^{133}Xe in curies: 2.6

^{135}Xe in curies: 4.0×10^{-2}

Gas Sampling Release Activity at Time of Release, in Curies: 5.2×10^{-1} (Controlled)

^3H in curies: 5.2×10^{-1}

^{85}Kr in curies: 4.5×10^{-4}

^{137}Cs in curies: 8.0×10^{-6}

Release Summary: A release occurred during a gas sampling operation on May 4, 1981, at 2013 hours and lasted for three minutes.

A second gas sampling release occurred on December 6, 1982. This controlled release was from the containment tank.

References: (E) (H) (X) (AL) (C0) (OW) (RL)

Test: NIZA

Date:	07/10/81	Sponsor:	LLNL
Time:	0700 PDT	Depth of Burial:	1,119 ft
Location:	NTS U9cr	Purpose:	Weapons Related
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Drillback and Gas Sampling

Drillback Release Activity at Time of Release: Slight

Gas Sampling Release Activity at Time of Release, in Curies: 7.1×10^{-4}

^3H in curies: 6.9×10^{-4}

^{85}Kr in curies: 1.5×10^{-5}

Release Summary: A controlled gas sampling containment tank release occurred on November 1, 1982.

References: (E) (H) (X) (C0) (AL)

Test:	ISLAY		
Date:	08/27/81	Sponsor:	LLNL
Time:	0731 PDT	Depth of Burial:	965 ft
Location:	NTS U2er	Purpose:	Weapons Related
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: 7.0×10^2

^{133}Xe in curies: 7.0×10^2

Release Summary: Release of radioactivity occurred during drillback operations; 700 curies of xenon were released when the drilling mud "kill" line was opened, and an additional 0.34 curies of xenon were released during other drillback operations. The releases occurred between 0400 and 0613 hours on August 30, 1981.

References: (E) (H) (X) (C0) (AL) (RM)

Test:	TREBBIANO		
Date:	09/04/81	Sponsor:	LANL
Time:	0800 PDT	Depth of Burial:	1,001 ft
Location:	NTS U3lj	Purpose:	Weapons Related
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: 2.0×10^2

^{133}Xe in curies: 2.0×10^2

^{131}I in curies: 5.0×10^{-2}

References: (E) (H) (AL) (RN)

Test:	TILCI		
Date:	11/11/81	Sponsor:	LLNL
Time:	1200 PST	Depth of Burial:	1,460 ft
Location:	NTS U4ak	Purpose:	Weapons Related
Type:	Shaft	Yield:	20 to 150 kt
Release Detected:	Onsite Only	Type of Release:	Gas Sampling

Gas Sampling Release Activity at Time of Release, in Curies: 3.0×10^{-3}

^{3}H in curies: 2.4×10^{-3}

^{85}Kr in curies: 6.0×10^{-4}

Release Summary: A controlled gas sampling containment tank release occurred on October 26, 1982.

References: (E) (H) (X) (AM) (C0)

Test:	AKAVI		
Date:	12/03/81	Sponsor:	LLNL
Time:	0700 PST	Depth of Burial:	1,621 ft
Location:	NTS U2es	Purpose:	Weapons Related
Type:	Shaft	Yield:	20 to 150 kt
Release Detected:	Onsite Only	Type of Release:	Gas Sampling

Gas Sampling Release Activity at Time of Release, in Curies: 4.6×10^{-4}

^{3}H in curies: 6.6×10^{-6}

^{85}Kr in curies: 4.5×10^{-4}

Release Summary: A controlled gas sampling containment tank release occurred on October 26, 1982.

References: (E) (H) (X) (AM) (C0)

Test:	CABOC		
Date:	12/16/81	Sponsor:	LLNL
Time:	1305 PST	Depth of Burial:	1,100 ft
Location:	NTS U2cp	Purpose:	Weapons Related
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Drillback and Gas Sampling

Drillback Release Activity at Time of Release, in Curies: 2.9×10^{-1}

^{133}Xe in curies: 1.8×10^{-1}

$^{133\text{m}}\text{Xe}$ in curies: 7.0×10^{-3}

^{135}Xe in curies: 1.1×10^{-1}

Gas Sampling Release Activity at Time of Release, in Curies: 3.1×10^{-4}

^{3}H in curies: 6.8×10^{-6}

^{85}K in curies: 3.0×10^{-4}

Release Summary: Two releases occurred through the ventilation line during postshot drilling as follows: (1) at 1807 hours on December 18, 1981, from the Postshot No. 1A drill hole, releasing 0.21 curies of xenon; and (2) at 0130 hours on December 21, 1981, from the Postshot No. 2A drill hole, releasing 0.086 curies of xenon.

A controlled gas sampling containment tank release occurred on December 6, 1982.

References: (E) (H) (AM) (C0) (O6) (RO)

MOLBO

Date:	02/12/82	Sponsor:	LLNL
Time:	0655 PST	Depth of Burial:	2,093 ft
Location:	NTS U20ag	Purpose:	Weapons Related
Type:	Shaft	Yield:	20 to 150 kt
Release Detected:	Onsite Only	Type of Release:	Gas Sampling

Gas Sampling Release Activity at Time of Release, in Curies: 3.9×10^{-3}

^{3}H in curies: 7.5×10^{-5}

^{85}Kr in curies: 3.8×10^{-3}

Release Summary: A controlled gas sampling containment tank release occurred on October 18, 1982.

References: (E) (H) (X) (AM) (C0)

GIBNE

Date:	04/25/82	Sponsor:	LLNL/UK
Time:	1105 PDT	Depth of Burial:	1,870 ft
Location:	NTS U20ah	Purpose:	Joint US-UK
Type:	Shaft	Yield:	20 to 150 kt
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: 9.4×10^{-2}

^{133}Xe in curies: 9.2×10^{-2}

$^{133\text{m}}\text{Xe}$ in curies: 2.0×10^{-3}

^{135}Xe in curies: 8.0×10^{-5}

Release Summary: A release occurred through the ventilation line on May 1, 1982, at 2130 hours lasting for 22.5 minutes, while pulling the drill string out of the hole.

References: (E) (H) (X) (AM) (O7) (RP)

Test: BOUSCHET

Date:	05/07/82	Sponsor:	LANL
Time:	1117 PDT	Depth of Burial:	1,850 ft
Location:	NTS U3la	Purpose:	Weapons Related
Type:	Shaft	Yield:	20 to 150 kt
Release Detected:	Onsite Only	Type of Release:	Cementback

Cementback Release Activity at Time of Release, in Curies: Less than 1.0

xenons in curies: less than 1.0

iodines in curies: less than 1.0×10^{-4}

Release Summary: A release occurred during cementback operations at approximately 1800 hours on June 10, 1982.

References: (E) (H) (J) (AM) (OP) (OQ) (RQ)

Test: MONTEREY

Date:	07/29/82	Sponsor:	LLNL
Time:	1305 PDT	Depth of Burial:	1,310 ft
Location:	NTS U4aj	Purpose:	Weapons Related
Type:	Shaft	Yield:	20 to 150 kt
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: 5.4×10^{-2}

^{133}Xe in curies: 4.6×10^{-2}

$^{133\text{m}}\text{Xe}$ in curies: 2.0×10^{-3}

^{135}Xe in curies: 6.0×10^{-3}

Release Summary: A drillback release occurred from the ventilation line at 2319 hours on August 1, 1982.

References: (E) (H) (X) (AM) (O8)

Test: **HURON LANDING*** (simultaneous with DIAMOND ACE)

Date: 09/23/82 **Sponsor:** DoD/LLNL

Time: 0900 PDT **Depth of Burial:** 1,340 ft

Location: NTS U12n.15 **Purpose:** Weapons Effects

Type: Tunnel **Yield:** Less than 20 kt

Release Detected: Onsite Only **Type of Release:** Controlled

Controlled Release Activity at Time of Release, in Curies: 2.8×10^2

Controlled Release Activity at R+12 Hours, in Curies: 1.2×10^2

Isotopes Detected in Release: ^{85m}Kr , ^{88}Kr , ^{133}Xe , ^{133m}Xe , and ^{135}Xe

Release Summary: A controlled ventilation of the tunnel occurred from H+27.8 hours until H+36 hours. Prior to that time, activity had been contained inside the OBP until ventilation could be established to the mesa. The release point was the N Tunnel mesa vent hole. The effluent was 86% ^{135}Xe , 7% ^{85m}Kr , 3% ^{133}Xe , 3% ^{133m}Xe , and 1% ^{88}Kr .

References: (E) (H) (W) (AM) (RS)

Test: **DIAMOND ACE*** (simultaneous with HURON LANDING)

Date: 09/23/82 **Sponsor:** DoD/LLNL

Time: 0900 PDT **Depth of Burial:** 1,335 ft

Location: NTS U12n.15 **Purpose:** Weapons Effects

Type: Tunnel **Yield:** Less than 20 kt

Release Detected: Onsite Only **Type of Release:** Controlled

Controlled Release Activity at Time of Release, in Curies: Included in HURON LANDING data.

Controlled Release Activity at R+12 Hours, in Curies: Included in HURON LANDING data.

Isotopes Detected in Release: Same as for HURON LANDING.

Release Summary: Same as for HURON LANDING.

References: (E) (H) (W) (AM) (RS)

*Tests were detonated simultaneously but are considered separate tests. Release data from each individual test is not available.

Test:	FRISCO		
Date:	09/23/82	Sponsor:	LLNL
Time:	1000 PDT	Depth of Burial:	1,480 ft
Location:	NTS U8m	Purpose:	Weapons Related
Type:	Shaft	Yield:	20 to 150 kt
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: 1.7

^{133}Xe in curies: 1.6

$^{133\text{m}}\text{Xe}$ in curies: 4.4×10^{-2}

^{135}Xe in curies: 6.6×10^{-3}

Release Summary: Fourteen intermittent releases occurred starting at 1530 hours on September 27, 1982, through 1226 hours on September 30, 1982, for a total release time of 36.2 minutes.

References: (E) (H) (X) (AM) (CQ) (RT)

Test:	MANTECA		
Date:	12/10/82	Sponsor:	LLNL
Time:	0720 PST	Depth of Burial:	1,355 ft
Location:	NTS U4al	Purpose:	Weapons Related
Type:	Shaft	Yield:	20 to 150 kt
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: 7.8×10^1

^{133}Xe in curies: 7.1×10^1

$^{133\text{m}}\text{Xe}$ in curies: 2.5

^{135}Xe in curies: 4.2

Release Summary: Twelve releases occurred intermittently from 1855 hours on December 12, 1982, to 0810 hours on December 14, 1982, for a total release time of approximately 1.7 hours.

References: (E) (H) (X) (AN) (C0)

Test:	CHEEDAM		
Date:	02/17/83	Sponsor:	LLNL
Time:	0900 PST	Depth of Burial:	1,125 ft
Location:	NTS U2et	Purpose:	Weapons Related
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Drillback and Gas Sampling

Drillback Release Activity at Time of Release, in Curies: 2.1×10^{-1}

^{133}Xe in curies: 1.8×10^{-1}

$^{133\text{m}}\text{Xe}$ in curies: 7.0×10^{-3}

^{135}Xe in curies: 2.0×10^{-2}

Gas Sampling Release Activity at Time of Release, in Curies: 7.7×10^{-4}

^3H in curies: 1.6×10^{-4}

^{85}Kr in curies: 6.0×10^{-4}

^{137}Cs in curies: 8.0×10^{-6}

Release Summary: A drillback release occurred from the ventilation line through the "kill" line at 2224 hours on February 20, 1983, lasting for 21 minutes.

A controlled gas sampling containment tank release occurred on December 6, 1983.

References: (E) (H) (X) (AN) (C0) (OA) (RU)

Test:	TURQUOISE		
Date:	04/14/83	Sponsor:	LANL
Time:	1105 PST	Depth of Burial:	1,749 ft
Location:	NTS U7bu	Purpose:	Weapons Related
Type:	Shaft	Yield:	Less than 150 kt
Release Detected:	Onsite Only	Type of Release:	Cementback

Cementback Release Activity at Time of Release, in Curies: 5.0×10^{-3}

^{133}Xe in curies: 5.0×10^{-3}

^{131}I in curies: 2.5×10^{-6}

Release Summary: A release occurred on May 18, 1983.

References: (E) (H) (AN) (RV)

Test: ARMADA

Date:	04/22/83	Sponsor:	LLNL/UK
Time:	0553 PST	Depth of Burial:	869 ft
Location:	NTS U9cs	Purpose:	Joint US-UK
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: 2.2×10^{-2}

^{133}Xe in curies: 1.4×10^{-2}

$^{133\text{m}}\text{Xe}$ in curies: 6.2×10^{-4}

^{135}Xe in curies: 7.1×10^{-3}

Release Summary: A small release occurred on April 24, 1983, at 2223 hours that lasted for five minutes. The release occurred through the ventilation line while pulling the drill string out of the hole.

References: (E) (H) (X) (AN) (OB) (RW)

Test: CROWDIE

Date:	05/05/83	Sponsor:	LLNL
Time:	0820 PDT	Depth of Burial:	1,280 ft
Location:	NTS U2fe	Purpose:	Weapons Related
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Drillback and Gas Sampling

Drillback Release Activity at Time of Release, in Curies: 7.0

^{133}Xe in curies: 3.1

$^{133\text{m}}\text{Xe}$ in curies: 1.4×10^{-1}

^{135}Xe in curies: 3.8

Gas Sampling Release Activity at Time of Release, in Curies: 3.8×10^{-2}

^3H in curies: 3.8×10^{-2}

^{85}Kr in curies: 3.0×10^{-4}

^{127}Xe in curies: 2.0×10^{-6}

Release Summary: Ten releases occurred through the ventilation line during coring operations, beginning at 0429 hours on May 7, 1983, and lasting for 182 minutes. An eleventh release occurred through the ventilation line beginning at 2113 hours on May 8, 1983, and lasting for four minutes.

A controlled gas sampling containment tank release occurred on December 6, 1983.

References: (E) (H) (X) (AN) (C0) (OC) (RX)

Test: MINI JADE

Date:	05/26/83	Sponsor:	DoD/LANL
Time:	0730 PDT	Depth of Burial:	1,243 ft
Location:	NTS U12n.12	Purpose:	Weapons Effects
Type:	Tunnel	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Controlled

Controlled Release Activity at Time of Release, in Curies: 1.0

Controlled Release Activity at R+12 Hours, in Curies: 1.0

Isotopes Detected in Release: ^{133}Xe and $^{133\text{m}}\text{Xe}$

Release Summary: A controlled ventilation occurred from H+5.2 days until H+6.2 days. Prior to that time, activity had been contained inside the DPP until ventilation to the mesa had been established. The release point was the N Tunnel mesa vent hole. Effluent was 89% ^{133}Xe and 11% $^{133\text{m}}\text{Xe}$.

References: (E) (H) (W) (AN) (RY)

Test: DANABLU

Date:	06/09/83	Sponsor:	LLNL
Time:	1010 PDT	Depth of Burial:	1,050 ft
Location:	NTS U2eu	Purpose:	Weapons Related
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: 8.2×10^{-2}

^{133}Xe in curies: 7.1×10^{-2}

^{135}Xe in curies: 1.1×10^{-2}

Release Summary: A release occurred on June 12, 1983.

References: (E) (H) (AN) (RZ)

Test: LABAN

Date:	08/03/83	Sponsor:	LLNL
Time:	0633 PDT	Depth of Burial:	1,070 ft
Location:	NTS U2ff	Purpose:	Weapons Related
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: 5.1×10^{-1}

^{133}Xe in curies: 2.5×10^{-1}

$^{133\text{m}}\text{Xe}$ in curies: 1.2

^{135}Xe in curies: 2.5×10^{-1}

^{131}I in curies: 1.1×10^{-5}

^{133}I in curies: 2.5×10^{-5}

Release Summary: A release occurred from the drill hole on August 5, 1983 and lasted for 48 minutes. At the same time, a release of xenons only occurred through the ventilation line. Other releases through the ventilation line occurred at 0132 hours, 1030 hours, and 1040 hours on August 6, 1983.

Two planned releases of radioactive gas trapped above the drill hole plugs were vented at 0155 hours and 0420 hours on August 7, 1983. The ventilation line releases on August 6 and 7, 1983, totalled less than 0.3 curies.

References: (E) (H) (AN) (OD) (SA)

Test: JARLSBERG

Date:	08/27/83	Sponsor:	LLNL
Time:	0700 PDT	Depth of Burial:	656 ft
Location:	NTS U10ca	Purpose:	Weapons Related
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: Less than 1.0×10^{-2}

^{133}Xe in curies: less than 1.0×10^{-2}

Release Summary: A release occurred on August 29, 1983, at 1720 hours when the abandonment valve was closed.

References: (H) (AN) (X)

Test:	ROMANO		
Date:	12/16/83	Sponsor:	LLNL
Time:	1030 PST	Depth of Burial:	1,690 ft
Location:	NTS U2ex	Purpose:	Weapons Related
Type:	Shaft	Yield:	20 to 150 kt
Release Detected:	Onsite Only	Type of Release:	Cementback

Cementback Release Activity at Time of Release, in Curies: 7.6×10^{-2}

^{133}Xe in curies: 7.3×10^{-2}

^{133m}Xe in curies: 2.3×10^{-3}

^{135}Xe in curies: 9.0×10^{-4}

Release Summary: A release occurred through the ventilation line during cementback operations at 0605 hours on December 21, 1983, and lasted for seven minutes.

References: (E) (H) (AO) (OF) (SB)

Test:	GORBEA		
Date:	01/31/84	Sponsor:	LLNL
Time:	0730 PST	Depth of Burial:	1,273 ft
Location:	NTS U2cq	Purpose:	Weapons Related
Type:	Shaft	Yield:	20 to 150 kt
Release Detected:	Onsite Only	Type of Release:	Drillback and Gas Sampling

Drillback Release Activity at Time of Release, in Curies: 9.9×10^{-1}

^{133}Xe in curies: 8.5×10^{-1}

^{133m}Xe in curies: 2.9×10^{-2}

^{135}Xe in curies: 1.1×10^{-1}

Gas Sampling Release Activity at Time of Release, in Curies: 1.1×10^1

^3H in curies: 1.4
 ^{133}Xe in curies: 2.5×10^{-2}
 ^{37}Ar in curies: 9.6

Release Summary: Seven intermittent releases occurred during postshot drilling operations from February 2-5, 1984, for a total release time of approximately 66 minutes.

Releases (controlled) from the gas sampling containment tank occurred on March 23, 1984, and April 18, 1984.

References: (E) (H) (I) (X) (AO) (CR) (SC)

Test:	AGRINI		
Date:	03/31/84	Sponsor:	LLNL
Time:	0630 PST	Depth of Burial:	1,050 ft
Location:	NTS U2ev	Purpose:	Weapons Related
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Test, Controlled and Drillback

Test Release at R+12 Hours, in Curies: 6.9×10^2

Isotopes Identified in the Release: $^{85\text{m}}\text{Kr}$, ^{87}Kr , ^{88}Kr , ^{133}Xe , $^{133\text{m}}\text{Xe}$, ^{135}Xe , and $^{135\text{m}}\text{Xe}$

Controlled Release Activity at Time of Release, in Curies: 3.0×10^{-2}

^3H in curies: 2.8×10^{-2}
 ^{133}Xe in curies: 2.8×10^{-4}
 ^{37}Ar in curies: 1.6×10^{-3}

Drillback Release Activity at Time of Release, in Curies: 2.0×10^{-3}

xenons in curies: 2.0×10^{-3}

Release Summary: Releases occurred as follows: (1) seepage from the crater from 1530 hours on March 31, 1984, to 1900 hours on April 1, 1984; (2) a controlled, filtered release on June 13, 1984; and (3) a ventilation line release at 0705 hours on April 5, 1984, during postshot drilling operations.

References: (E) (H) (I) (X) (AO) (CS) (OG) (OO) (SD)

ORKNEY			
Date:	05/02/84	Sponsor:	LLNL
Time:	0650 PDT	Depth of Burial:	689 ft
Location:	NTS U10be	Purpose:	Weapons Related
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: 5.3×10^{-1}

^{133}Xe in curies: 4.1×10^{-1}

$^{133\text{m}}\text{Xe}$ in curies: 1.7×10^{-2}

^{135}Xe in curies: 9.8×10^{-2}

Release Summary: A release occurred from the ventilation line at 0927 hours on May 5, 1984.

References: (H) (AO) (Q0) (Q1)

CAPROCK			
Date:	05/31/84	Sponsor:	LANL
Time:	0604 PDT	Depth of Burial:	1,969 ft
Location:	NTS U4q	Purpose:	Weapons Related
Type:	Shaft	Yield:	20 to 150 kt
Release Detected:	Onsite Only	Type of Release:	Gas Sampling

Gas Sampling Release Activity at Time of Release, in Curies: 5.5×10^{-2} (Accidental)

^3H in curies: 4.2×10^{-2}

^{85}Kr in curies: 3.6×10^{-4}

^{37}Ar in curies: 1.3×10^{-2}

^{133}Xe in curies: 3.5×10^{-5}

Gas Sampling Release Activity at Time of Release, in Curies: 6.7×10^{-3} (Controlled)

^3H in curies: 6.1×10^{-3}

^{85}Kr in curies: 6.1×10^{-4}

Release Summary: LLNL performed a gas sampling operations on January 15, 1985, from which there was an accidental release and on March 5, 1985, from which there was a controlled release from the gas sampling containment tank.

References: (E) (H) (X) (AO) (T4)

Test:	KAPPELI		
Date:	07/25/84	Sponsor:	LLNL
Time:	0830 PDT	Depth of Burial:	2,100 ft
Location:	NTS U20am	Purpose:	Weapons Related
Type:	Shaft	Yield:	20 to 150 kt
Release Detected:	Onsite Only	Type of Release:	<u>Late-Time Seepage</u>

Natural, Late-Time Seepage at Time of Release, in Curies: 1.2×10^1

Isotopes Detected in the Release: ^{85}Kr

Release Summary: Seepage began months after the test and continued as follows:

9/24/84 - 12/31/84 0.5 curies of ^{85}Kr

11/25/84 - 7/25/85 3.6 curies of ^{85}Kr

7/25/85 - 7/25/86 5.0 curies of ^{85}Kr

References: (E) (H) (I) (X) (AO) (CU)

Test:	BRETON		
Date:	09/13/84	Sponsor:	LLNL
Time:	0700 PDT	Depth of Burial:	1,585 ft
Location:	NTS U4ar	Purpose:	Weapons Related
Type:	Shaft	Yield:	20 to 150 kt
Release Detected:	Onsite Only	Type of Release:	<u>Drillback and Gas Sampling</u>

Drillback Release Activity at Time of Release, in Curies: 1.5×10^{-2}

^{133}Xe in curies: 9.6×10^{-3}

$^{133\text{m}}\text{Xe}$ in curies: 4.2×10^{-4}

^{135}Xe in curies: 5.2×10^{-3}

Gas Sampling Release Activity at Time of Release in Curies: 3.7 (Controlled)

^{133}Xe in curies: 2.2×10^{-1}

$^{133\text{m}}\text{Xe}$ in curies: 1.1×10^{-2}

^3H in curies: 3.5

Gas Sampling Release Activity at Time of Release, in Curies: 1.6×10^{-1} (Accidental)

^{131m}Xe in curies: 7.5×10^{-5}

^{133}Xe in curies: 9.7×10^{-5}

^{85}Kr in curies: 1.0×10^{-3}

^3H in curies: 1.2×10^{-1}

^{37}Ar in curies: 3.5×10^{-2}

Release Summary: Releases occurred as follows: (1) a drillback release of 0.015 curies of xenon isotopes from the ventilation line on September 15, 1984, at 1834 hours, lasting for 4 minutes; (2) three controlled gas sampling releases totalling 3.7 curies of xenon isotopes and tritium at: a) 0939 hours on September 20, 1984, lasting for 53 minutes; b) 0917 hours on September 24, 1984, lasting for 93 minutes; and c) 1043 hours on October 9, 1984, lasting for 51 minutes; and (3) an accidental release on January 15, 1985, from a break in the gas sampling hose (not during a gas sampling operation).

References: (E) (H) (I) (X) (AO) (CV) (CW) (OH) (SS)

Test:	TIERRA		
Date:	12/15/84	Sponsor:	LLNL
Time:	0645 PST	Depth of Burial:	2,100 ft
Location:	NTS U19ac	Purpose:	Weapons Related
Type:	Shaft	Yield:	20 to 150 kt
Release Detected:	Onsite Only	Type of Release:	Late-Time Seepage

Natural, Late-Time Seepage at Time of Release, in Curies: 6.0×10^{-2}

^{133}Xe in curies: 5.7×10^{-2}

^{131m}Xe in curies: 4.0

^{85}Kr in curies: 1.2×10^{-1}

^{37}Ar in curies: 9.0

Release Summary: Seepage occurred intermittently from December 26, 1984, to January 4, 1986.

References: (E) (H) (X) (AP) (CX) (SE)

Test:	VAUGHN		
Date:	03/15/85	Sponsor:	LANL
Time:	0831 PST	Depth of Burial:	1,401 ft
Location:	NTS U3lr	Purpose:	Weapons Related
Type:	Shaft	Yield:	20 to 150 kt
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: 1.0×10^2

^{133}Xe and ^{135}Xe in curies: 1.0×10^2

iodines in curies: 6.0×10^{-3}

Release Summary: A release occurred during installation of gas sampling tubing.

References: (E) (H) (AP) (SF)

Test:	MISTY RAIN		
Date:	04/06/85	Sponsor:	DoD/LLNL
Time:	1515 PST	Depth of Burial:	1,276 ft
Location:	NTS U12n.17	Purpose:	Weapons Effects
Type:	Tunnel	Yield:	Less than 20 kt
Release Detected:	Offsite	Type of Release:	Controlled

Controlled Release Activity at Time of Release, in Curies: 6.3×10^1

Controlled Release Activity at R+12 Hours, in Curies: 4.5×10^1

Isotopes Detected in Release: ^{133}Xe , $^{133\text{m}}\text{Xe}$, and ^{135}Xe

Maximum Activity Detected in Air Offsite: 47 ± 10 picocuries of ^{133}Xe per cubic meter of air at Reed Ranch Road, Nevada (unpopulated); 11 ± 5 picocuries of ^{133}Xe per cubic meter of air at Rachel, Nevada (populated)

Maximum Gamma Exposure Rate Detected Offsite: No radiation intensities above background levels were detected.

Maximum Iodine Level Detected Offsite: No iodines were detected.

Maximum Distance Radiation Detected Offsite: No radiation intensities above background levels were detected.

Release Summary: Controlled ventilation occurred from H+2.85 days until H+4 days. Prior to that time, the activity had been contained inside the gas seal plug until ventilation could be reestablished. The release points were the N Tunnel portal and the N Tunnel mesa ventilation lines. The effluent was 72% ^{133}Xe , 22% ^{135}Xe , and 6% $^{133\text{m}}\text{Xe}$.

References: (E) (H) (W) (AP) (DV) (SG)

Test:	SALUT		
Date:	06/12/85	Sponsor:	LLNL
Time:	0815 PDT	Depth of Burial:	1,995 ft
Location:	NTS U20ak	Purpose:	Weapons Related
Type:	Shaft	Yield:	20 to 150 kt
Release Detected:	Onsite Only	Type of Release:	Drillback and Gas Sampling

Drillback Release Activity at Time of Release, in Curies: 3.1

^{133}Xe in curies: 3.0

$^{133\text{m}}\text{Xe}$ in curies: 6.0×10^{-2}

^{135}Xe in curies: 2.2×10^{-2}

Gas Sampling Release Activity at Time of Release, in Curies: 7.8×10^{-1}

^3H in curies: 5.5×10^{-4}

^{85}Kr in curies: 2.5×10^{-2}

^{127}Xe in curies: 1.2×10^{-4}

^{133}Xe in curies: 2.6×10^{-1}

$^{133\text{m}}\text{Xe}$ in curies: 4.9×10^{-1}

^{131}I in curies: 1.1×10^{-4}

tritiated water: 5.3×10^{-5}

Release Summary: Four drillback releases occurred from the postshot ventilation line as follows: (1) at 1802 hours on June 19, 1985, lasting for 3.9 minutes; (2) at 2226 hours on June 19, 1985, lasting for 13 minutes; (3) at 1915 hours on June 20, 1985, lasting for 36.6 minutes and; (4) at 2110 hours on June 20, 1985, lasting for 10.3 minutes.

A controlled gas sampling containment tank release occurred on August 6, 1985.

References: (E) (H) (X) (AP) (C0) (SH)

Test:	VILLE		
Date:	06/12/85	Sponsor:	LLNL
Time:	1030 PDT	Depth of Burial:	961 ft
Location:	NTS U4am	Purpose:	Weapons Related
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Drillback and Gas Sampling

Drillback Release Activity at Time of Release, in Curies: 9.7×10^{-2}

^{133}Xe in curies: 7.0×10^{-2}

$^{133\text{m}}\text{Xe}$ in curies: 3.0×10^{-3}

^{135}Xe in curies: 2.4×10^{-2}

Gas Sampling Release Activity at Time of Release, in Curies: 1.1×10^{-3}

^3H in curies: 1.0×10^{-3}

^{85}Kr in curies: 1.1×10^{-4}

Release Summary: A drillback release occurred from the postshot ventilation line on June 15, 1985.

A controlled gas sampling containment tank release occurred on August 6, 1986.

References: (E) (H) (X) (AP) (SI)

Test:	MARIBO		
Date:	06/26/85	Sponsor:	LLNL
Time:	1103 PDT	Depth of Burial:	1,250 ft
Location:	NTS U2cs	Purpose:	Weapons Related
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: 4.2

^{133}Xe in curies: 3.1

$^{133\text{m}}\text{Xe}$ in curies: 1.5×10^{-1}

^{135}Xe in curies: 9.2×10^{-1}

Release Summary: Drillback releases occurred from the postshot ventilation line at 1145 hours on June 28, 1985, lasting for 4.5 minutes, and at 0107 hours on June 29, 1985, lasting for 52 minutes.

References: (E) (H) (X) (AP) (SJ)

Test:	SERENA		
Date:	07/25/85	Sponsor:	LLNL
Time:	0700 PDT	Depth of Burial:	1,959 ft
Location:	NTS U20an	Purpose:	Weapons Related
Type:	Shaft	Yield:	20 to 150 kt
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: 2.9

^{133}Xe in curies: 2.7

$^{133\text{m}}\text{Xe}$ in curies: 1.0×10^{-1}

^{135}Xe in curies: 8.0×10^{-2}

Release Summary: Eight drillback releases occurred from the postshot ventilation line as follows: (1) at 2148 hours on July 28, 1985, lasting for one minute; (2) at 1705 hours on August 1, 1985, lasting for one minute; (3) at 1727 hours on August 1, 1985, lasting for one minute; (4) at 1301 hours on August 3, 1985, lasting for one minute; (5) at 0920 hours on August 4, 1985, lasting for one minute; (6) at 0325 hours on August 6, 1985, lasting for 43 minutes; (7) at 1325 hours on August 6, 1985, lasting for 3.5 minutes; and (8) at 1341 hours on August 6, 1985, lasting for 1.5 minutes.

References: (E) (H) (X) (AP) (SK)

Test:	CEBRERO		
Date:	08/14/85	Sponsor:	LLNL
Time:	0600 PDT	Depth of Burial:	600 ft
Location:	NTS U9cw	Purpose:	Weapons Related
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Gas Sampling

Gas Sampling Release Activity at Time of Release, in Curies: 4.3×10^{-4}

^3H in curies: 4.0×10^{-4}

^{85}Kr in curies: 3.2×10^{-5}

Release Summary: A controlled gas sampling containment tank release occurred on August 6, 1986.

References: (E) (H) (X) (AP) (C0)

Test:	MILL YARD		
Date:	10/09/85	Sponsor:	DoD/LANL
Time:	1340 PDT	Depth of Burial:	1,230 ft
Location:	NTS U12n.20	Purpose:	Weapons Effects
Type:	Tunnel	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Controlled

Controlled Release Activity at Time of Release, in Curies: 5.9

Controlled Release Activity at R+12 Hours, in Curies: 4.6

Isotopes Detected in Release: ^{133}Xe , ^{135}Xe , and $^{133\text{m}}\text{Xe}$

Release Summary: Controlled ventilations occurred as follows:

1. Controlled ventilation from the working point side of the U12n.20 drift was conducted from H+1.9 days until H+2.5 days. The effluent was 80% ^{135}Xe , 18% ^{133}Xe , and 2% $^{133\text{m}}\text{Xe}$.
2. A controlled release occurred during ventilation of the MILL YARD cavity from H+16 days until H+18 days. The effluent was 98% ^{133}Xe and 2% $^{133\text{m}}\text{Xe}$.

References: (E) (H) (W) (AQ) (SL)

Test:	DIAMOND BEECH		
Date:	10/09/85	Sponsor:	DoD/LLNL
Time:	1620 PDT	Depth of Burial:	1,325 ft
Location:	NTS U12n.19	Purpose:	Weapons Effects
Type:	Tunnel	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Controlled

Controlled Release Activity at Time of Release, in Curies: 1.1

Controlled Release Activity at R+12 Hours, in Curies: 1.0

Isotopes Detected in Release: ^{133}Xe , $^{133\text{m}}\text{Xe}$, and ^{135}Xe

Release Summary: Controlled ventilations occurred as follows:

1. Ventilation of the tunnel to the portal side of the U12n.19 DPP occurred from H+1.8 days until H+2.5 days. The effluent was 80% ^{135}Xe , 11% $^{133\text{m}}\text{Xe}$, and 9% ^{133}Xe .
2. Ventilation of the U12n.19 main drift occurred from H+8 days until H+9 days. The effluent was 82% ^{133}Xe and 18% $^{133\text{m}}\text{Xe}$.

References: (E) (H) (W) (AQ) (SL)

Test:	ROQUEFOR		
Date:	10/16/85	Sponsor:	LLNL
Time:	1435 PDT	Depth of Burial:	1,362 ft
Location:	NTS U4as	Purpose:	Weapons Related
Type:	Shaft	Yield:	20 to 150 kt
Release Detected:	Onsite Only	Type of Release:	Gas Sampling

Gas Sampling Release Activity at Time of Release, in Curies: 2.7×10^{-2}

^{3}H in curies:	2.4×10^{-2}
^{85}Kr in curies:	3.4×10^{-3}
^{127}Xe in curies:	2.1×10^{-5}
^{131}I in curies:	5.6×10^{-7}
tritiated water in curies:	2.6×10^{-5}

Release Summary: A controlled gas sampling containment tank release occurred on August 6, 1986.

References: (E) (H) (X) (AQ) (C0)

Test:	ABO		
Date:	10/30/85	Sponsor:	LANL
Time:	0800 PST	Depth of Burial:	644 ft
Location:	NTS U3mc	Purpose:	Weapons Related
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: $6.0 - 3.0 \times 10^{-1}$

iodines in curies:	$3.0 \times 10^{-2} - 1.4 \times 10^{-1}$
xenons in curies:	$6.0 - 3.0 \times 10^{-1}$

Release Summary: A release occurred from the mud line between 1900 and 2000 hours on October 31, 1965.

References: (E) (H) (AQ) (Q2) (QI) (TD)

Test:	GLENCOE		
Date:	03/22/86	Sponsor:	LANL
Time:	0815 PST	Depth of Burial:	2,000 ft
Location:	NTS U4i	Purpose:	Weapons Related
Type:	Shaft	Yield:	29 kt
Release Detected:	Offsite	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: 7.4×10^{-2}

^{133}Xe in curies: 7.4×10^{-2}

^{135}Xe in curies: 8.9×10^{-6}

^{131}I in curies: 8.9×10^{-6}

^{133}I in curies: 9.6×10^{-6}

Maximum Distance Radiation Detected Offsite: Eighty-four picocuries of ^{133}Xe per cubic meter of air were measured on a gas sampler at Lathrop Wells, Nevada.

Release Summary: A release occurred during a sampling operation on March 27, 1989.

References: (E) (H) (U) (AQ) (HZ) (SM) (SV)

Test:	MIGHTY OAK		
Date:	04/10/86	Sponsor:	DoD/LLNL
Time:	0608 PST	Depth of Burial:	1,294 ft
Location:	NTS U12t.08	Purpose:	Weapons Effects
Type:	Tunnel	Yield:	Less than 20 kt
Release Detected:	Offsite	Type of Release:	Controlled

Controlled Release Activity at Time of Release, in Curies: 3.6×10^{-4}

Controlled Release Activity at R+12 Hours, in Curies: 3.3×10^{-4}

Isotopes Detected in Release: ^{85}Kr , ^{131}I , and ^{133}Xe *

Maximum Activity Detected in Air Offsite: 430 ± 15 picocuries of ^{133}Xe per cubic meter of air at Medlins Ranch, Nevada

Maximum Gamma Exposure Rate Detected Offsite: No radiation intensities above background levels were detected.

Maximum Iodine Level Detected Offsite: 4.6 picocuries of ^{131}I per cubic meter of air at Twin Springs Ranch, Nevada**

Maximum Distance Radiation Detected Offsite: No radiation intensities above background were detected.

Release Summary: Eight controlled ventilations occurred as follows:

1. Controlled ventilation from the gas seal plug (GSP) to the DPP was performed from 0950 hours on April 22 to 0611 hours on April 23, 1986. At the time of release, 340 curies of activity were released (calculated to be 316 curies at R+12).***
2. Controlled ventilation of the tunnel complex, work point side of the DPP, was performed from 1040 hours to 1440 hours on April 25. At the time of release, 3,400 curies were released (calculated to be 3,200 curies at R+12).***
3. Controlled ventilation of the tunnel complex occurred from 1002 hours on April 28 to 0310 hours on April 29. At the time of release, 9,800 curies were released (calculated to be 9,100 curies at R+12).***
4. Controlled ventilation of the tunnel complex occurred from 1034 hours to 1504 hours on April 29. At the time of release, 1,800 curies were released (calculated to be 1,700 curies at R+12).***
5. Controlled ventilation of the tunnel complex occurred from 1422 hours to 1805 hours on April 30. At the time of release, 1,200 curies were released (calculated to be 1,100 curies at R+12).***
6. Controlled ventilation of the tunnel complex occurred from 1011 hours to 1937 hours on May 1, 1986. At the time of release, 4,900 curies were released (calculated to be 4,600 curies at R+12).***
7. Controlled ventilation of the tunnel complex occurred from 0946 hours on May 2 to 0450 hours on May 4. At the time of release, 9,000 curies were released (calculated to be 8,400 curies at R+12).***
8. Controlled ventilation of the tunnel complex occurred from 1350 hours on May 5 to 1050 hours on May 19. At the time of release, 5,500 curies were released (calculated to be 5,100 curies at R+12).***

The total release, at the time of release, was 36,000 curies; at R+12, the total activity was calculated to be 33,000 curies.

References: (E) (H) (K) (T) (U) (AQ) (CA) (DT)

*The total release associated with MIGHTY OAK was assumed to be all ^{133}Xe , but during the ventilation period, 2.4 curies of ^{131}I and 4.3 curies of ^{85}Kr were also released.

**Attributed to the Chernobyl nuclear accident in the Soviet Union and not to this test.

***All ventilations of the tunnel were accomplished with the approval of the Test Controller.

Test:	JEFFERSON		
Date:	04/22/86	Sponsor:	LLNL
Time:	0630 PST	Depth of Burial:	1,998 ft
Location:	NTS U20ai	Purpose:	Weapons Related
Type:	Shaft	Yield:	20 to 150 kt
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: 1.4×10^{-2}

^{133}Xe in curies: 1.4×10^{-2}

$^{133\text{m}}\text{Xe}$ in curies: 3.6×10^{-4}

^{135}Xe in curies: 1.6×10^{-5}

Release Summary: A release occurred through the ventilation line on April 28, 1986, at 1310 hours lasting for six minutes, as the drill string was being removed from the hole.

References: (E) (H) (X) (AQ) (OI) (SN)

Test:	PANAMINT		
Date:	05/21/86	Sponsor:	LLNL
Time:	0659 PDT	Depth of Burial:	1,575 ft
Location:	NTS U2gb	Purpose:	Weapons Related
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Drillback and Gas Sampling

Drillback Release Activity at Time of Release, in Curies: 3.3

^{133}Xe in curies: 1.2

$^{133\text{m}}\text{Xe}$ in curies: 6.0×10^{-3}

^{135}Xe in curies: 2.1

^{131}I in curies: 1.0×10^{-4}

^{133}I in curies: 9.0×10^{-4}

Gas Sampling Release Activity at Time of Release, in Curies: 1.5×10^{-1}

^3H in curies: 1.5×10^{-1}

^{85}Kr in curies: 2.5×10^{-4}

Release Summary: Releases occurred through the Regan head and the ventilation line during postshot drilling operations at 1358 hours on May 23, 1986, lasting for 3.7 minutes.

A gas sampling experiment was performed on June 26, 1987, from which a controlled release occurred.

References: (E) (H) (X) (AQ) (OJ) (SO) (TF)

Test:	CYBAR		
Date:	07/17/86	Sponsor:	LANL
Time:	1400 PDT	Depth of Burial:	2,060 ft
Location:	NTS U19ar	Purpose:	Weapons Related
Type:	Shaft	Yield:	119 kt
Release Detected:	Onsite Only	Type of Release:	Cementback

Cementback Release Activity at Time of Release, in Curies: 3.0×10^{-3}

^{133}Xe in curies: 3.0×10^{-3}

Release Summary: A release occurred on August 14, 1986.

References: (E) (H) (AQ) (SP) (SV)

Test:	CORNUCOPIA		
Date:	07/24/86	Sponsor:	LLNL
Time:	0805 PDT	Depth of Burial:	1,250 ft
Location:	NTS U2gaS	Purpose:	Weapons Related
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Gas Sampling

Gas Sampling Release Activity at Time of Release, in Curies: 1.1×10^{-2}

^3H in curies: 9.9×10^{-3}

^{85}Kr in curies: 6.6×10^{-4}

Release Summary: A controlled release occurred during a gas sampling operation conducted on June 26, 1987.

References: (E) (H) (X) (AQ) (TG)

Test:	LABQUARK		
Date:	09/30/86	Sponsor:	LLNL
Time:	1530 PDT	Depth of Burial:	2,020 ft
Location:	NTS U19an	Purpose:	Weapons Related
Type:	Shaft	Yield:	20 to 150 kt
Release Detected:	Onsite Only	Type of Release:	Late-Time Seepage

Natural, Late-Time Seepage Activity at Time of Release, in Curies: 1.6×10^1

^{133}Xe in curies: 2.6

^{85}Kr in curies: 1.3×10^1

Release Summary: Two late-time releases, due to seepage, occurred from October 25, 1986 to January 13, 1987.

References: (E) (H) (X) (AQ) (T5)

Test:	BELMONT		
Date:	10/16/86	Sponsor:	LLNL
Time:	1200 PDT	Depth of Burial:	1,985 ft
Location:	NTS U20as	Purpose:	Weapons Related
Type:	Shaft	Yield:	20 to 150 kt
Release Detected:	Onsite Only	Type of Release:	Drillback and Gas Sampling

Drillback Release Activity at Time of Release, in Curies: 1.5×10^1

^{133}Xe in curies: 1.5×10^{-1}

$^{133\text{m}}\text{Xe}$ in curies: 3.4×10^{-3}

^{135}Xe in curies: 8.0×10^{-5}

Gas Sampling Release Activity at Time of Release, in Curies: 6.4×10^{-2}

^3H in curies: 4.8×10^{-2}

^{85}Kr in curies: 1.6×10^{-2}

Release Summary: A release through the ventilation line during drillback operations occurred at 0555 hours on October 23, 1986, and lasted for four minutes.

A gas sampling experiment was performed on July 14, 1987, from which a controlled release occurred.

References: (E) (H) (X) (BA) (OK) (SQ) (TH)

Test:	GASCON		
Date:	11/14/86	Sponsor:	LANL
Time:	0800 PST	Depth of Burial:	1,949 ft
Location:	NTS U4t	Purpose:	Weapons Related
Type:	Shaft	Yield:	20 to 150 kt
Release Detected:	Onsite Only	Type of Release:	Gas Sampling

Gas Sampling Release Activity at Time of Release, in Curies: 7.3×10^{-3}

^{3}H in curies: 6.7×10^{-3}

^{85}Kr in curies: 6.3×10^{-4}

^{127}Xe in curies: 2.9×10^{-5}

Release Summary: LLNL performed a gas sampling experiment in June 1987 from which there was a controlled release.

References: (E) (H) (X) (BA) (TI)

Test:	BODIE		
Date:	12/13/86	Sponsor:	LLNL
Time:	0950 PST	Depth of Burial:	2,083 ft
Location:	NTS U20ap	Purpose:	Weapons Related
Type:	Shaft	Yield:	20 to 150 kt
Release Detected:	Onsite Only	Type of Release:	Drillback and Late-Time Seepage

Drillback Release Activity at Time of Release, in Curies: 1.2

^{133}Xe in curies: 1.2

$^{133\text{m}}\text{Xe}$ in curies: 4.8×10^{-2}

^{135}Xe in curies: 9.8×10^{-4}

Natural, Late-Time Seepage Activity at Time of Release, in Curies: 5.0×10^{-1}

^{133}Xe in curies: 4.4×10^{-1}

$^{133\text{m}}\text{Xe}$ in curies: 2.0

$^{131\text{m}}\text{Xe}$ in curies: 1.0

^{85}Kr in curies: 2.0

^{37}Ar in curies: 1.0

Release Summary: Five drillback releases occurred from the ventilation line from 2307 hours on December 20, 1986, until 0215 hours on December 21, 1986, for a total release time of 24.3 minutes. Seepage occurred continuously from December 15, 1986, to January 20, 1987, and sporadically, depending on the atmospheric pressure, until December 16, 1987.

References: (E) (H) (X) (BA) (OL) (OM) (SR) (TJ)

Detonations:	HAZEBROOK, -EMERALD (GREEN)*, -CHECKERBERRY (RED)*, -APRICOT (ORANGE)** (simultaneous, same hole)		
Date:	02/03/87	Sponsor:	LLNL
Time:	0720 PST	Depth of Burial:	610 ft, 742 ft, 860 ft
Location:	NTS U10bh	Purpose:	Weapons Related* Safety Experiment**
Type:	Shaft	Yield:	Less than 20 kt (each)
Release Detected:	Onsite Only	Type of Release:	Gas Sampling

Gas Sampling Release Activity at Time of Release, in Curies: 2.4×10^{-3}

^3H in curies: 2.3×10^{-3}

^{85}Kr in curies: 1.0×10^{-4}

^{137}Cs in curies: 8.2×10^{-6}

Release Summary: LLNL performed a gas sampling experiment on June 26, 1987, from which there was a controlled release from the containment tank.

References: (E) (H) (X) (BA) (TK)

Test:	HARDIN		
Date:	04/30/87	Sponsor:	LLNL
Time:	0630 PDT	Depth of Burial:	2,051 ft
Location:	NTS U20av	Purpose:	Weapons Related
Type:	Shaft	Yield:	20 to 150 kt
Release Detected:	Onsite Only	Type of Release:	Gas Sampling

Gas Sampling Release Activity at Time of Release, in Curies: 2.1×10^{-1}

^3H in curies: 1.9×10^{-1}

^{85}Kr in curies: 2.4×10^{-2}

^{137}Cs in curies: 8.9×10^{-6}

Release Summary: A controlled release occurred during gas sampling operations on November 9, 1987.

References: (E) (H) (X) (BA) (TL)

Test:	MISSION GHOST		
Date:	06/20/87	Sponsor:	DoD/LANL
Time:	0900 PDT	Depth of Burial:	1,054 ft
Location:	NTS U12t.09	Purpose:	Weapons Effects
Type:	Tunnel	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Controlled

Controlled Release at Time of Release, in Curies: 3.0

^{85}Kr in curies: 3.0

Release Summary: The activity was contained within the cavity until ventilation was established on December 16, 1987. The release continued intermittently for approximately three weeks.

References: (E) (H) (K) (BA) (CB) (TM)

Test:	PANCHUELA		
Date:	06/30/87	Sponsor:	LANL
Time:	0905 PDT	Depth of Burial:	1,050 ft
Location:	NTS U3mg	Purpose:	Weapons Related
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: $5.0 - 1.0 \times 10^2$

xenons in curies: $5.0 - 1.0 \times 10^2$

iodines in curies: $5.0 \times 10^{-2} - 3.0 \times 10^{-1}$

Release Summary: A drillback release occurred between 0600 and 1235 hours on July 3, 1987.

References: (E) (H) (Y) (BA) (OP) (OR) (TN) (TO)

Test:	LOCKNEY		
Date:	09/24/87	Sponsor:	LANL
Time:	0800 PDT	Depth of Burial:	2,020 ft
Location:	NTS U19aq	Purpose:	Weapons Related
Type:	Shaft	Yield:	20 to 150 kt
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: 4.0

xenons in curies: 4.0

iodines in curies: 1.0×10^{-3}

Release Summary: A drillback release occurred between 1900 and 2000 hours on October 6, 1987.

References: (E) (H) (Y) (BA) (OP) (OS) (TN) (TP)

Test:	BORATE		
Date:	10/23/87	Sponsor:	LLNL
Time:	0900 PDT	Depth of Burial:	1,780 ft
Location:	NTS U2ge	Purpose:	Weapons Related
Type:	Shaft	Yield:	20 to 150 kt
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: 2.4×10^{-2}

^{133}Xe in curies: 1.9×10^{-2}

$^{133\text{m}}\text{Xe}$ in curies: 7.8×10^{-4}

^{135}Xe in curies: 4.6×10^{-3}

Release Summary: A drillback release occurred through the ventilation line filter system at 1126 hours on October 26, 1987, and lasted for 2.8 minutes.

References: (E) (H) (X) (BB) (ON) (OT) (TQ)

SCHELLBOURNE			
Date:	05/13/88	Sponsor:	LLNL
Time:	0835 PDT	Depth of Burial:	1,520 ft
Location:	NTS U2gf	Purpose:	Weapons Related
Type:	Shaft	Yield:	Less than 150 kt
Release Detected:	Onsite Only	Type of Release:	Drillback and Gas Sampling

Drillback Release Activity at Time of Release, in Curies: 2.2×10^1

^{133}Xe in curies: 1.4×10^1

$^{133\text{m}}\text{Xe}$ in curies: 2.0×10^{-1}

^{135}Xe in curies: 7.3

^{131}I in curies: 3.2×10^{-5}

^{133}I in curies: 1.1×10^{-4}

Gas Sampling Release Activity at Time of Release, in Curies: 1.1×10^{-1}

^{137}Cs in curies: 7.3×10^{-6}

^{85}Kr in curies: 1.8×10^{-2}

^3H in curies: 8.7×10^{-2}

Release Summary: Several intermittent drillback releases occurred from the ventilation line beginning at 1728 hours on May 15, 1988, until 1206 hours on May 20, 1988. A release from the drilling platform occurred on May 15, 1988.

A gas sampling operation was performed on July 13, 1989, from which there was a controlled release from the containment tank.

References: (E) (H) (X) (BB) (OU) (T1) (TR) (VJ)

COMSTOCK			
Date:	06/02/88	Sponsor:	LLNL
Time:	0600 PDT	Depth of Burial:	2,035 ft
Location:	NTS U20ay	Purpose:	Weapons Related
Type:	Shaft	Yield:	Less than 150 kt
Release Detected:	Onsite Only	Type of Release:	Gas Sampling

Gas Sampling Release Activity at Time of Release, in Curies: 4.3×10^{-3}

^{85}Kr in curies: 3.3×10^{-4}

^3H in curies: 4.0×10^{-3}

Release Summary: A gas sampling operation was performed on July 12, 1989, from which there was a controlled release from the containment tank.

References: (E) (H) (X) (BB) (T1)

Test: **BULLFROG**

Date:	08/30/88	Sponsor:	LLNL
Time:	1100 PDT	Depth of Burial:	1,605 ft
Location:	NTS U4au	Purpose:	Weapons Related
Type:	Shaft	Yield:	Less than 150 kt
Release Detected:	Onsite Only	Type of Release:	Drillback and Gas Sampling

Drillback Release Activity at Time of Release, in Curies: 4.4

^{133}Xe in curies: 4.1

$^{133\text{m}}\text{Xe}$ in curies: 2.6×10^{-1}

^{135}Xe in curies: 7.3×10^{-2}

Gas Sampling Release Activity at Time of Release, in Curies: 3.6×10^{-2}

^{85}Kr in curies: 9.0×10^{-3}

^3H in curies: 2.7×10^{-2}

Release Summary: Seven intermittent drillback releases occurred from the ventilation line beginning at 1027 hours on September 3, 1988, until 2304 hours on September 4, 1988, lasting for 36 minutes.

A gas sampling operation was performed on July 13, 1989, from which there was a controlled release.

References: (E) (H) (X) (BB) (OV) (T1) (TR) (VK)

Test:	MISTY ECHO		
Date:	12/10/88	Sponsor:	DoD/LANL
Time:	1230 PST	Depth of Burial:	1,313 ft
Location:	NTS U12n.23	Purpose:	Weapons Effects
Type:	Tunnel	Yield:	Less than 150 kt
Release Detected:	Onsite Only	Type of Release:	Gas Sampling

Gas Sampling Release Activity at Time of Release, in Curies: 6.7

^{127}Xe in curies:	5.8×10^{-6}
$^{129\text{m}}\text{Xe}$ in curies:	7.5×10^{-5}
$^{131\text{m}}\text{Xe}$ in curies:	3.4×10^{-2}
^{133}Xe in curies:	3.4×10^{-1}
^{85}Kr in curies:	1.2×10^{-1}
^3H in curies:	3.4×10^{-2}
^{37}Ar in curies:	6.2
^{39}Ar in curies:	2.7×10^{-3}

Release Summary: Effluent was released during an experimental gas diagnostics program that started on January 26, 1989, and continued intermittently until April 19, 1989. The effluent was filtered before being released into the tunnel ventilation system.

References: (E) (H) (K) (BC) (CD) (T0)

Detonations:	KAWICH-RED, -BLACK (simultaneous, same hole)		
Date:	02/24/89	Sponsor:	LLNL
Time:	0815 PST	Depth of Burial:	1,214 ft, 1,414 ft
Location:	NTS U2cu	Purpose:	Weapons Related (-RED) Safety Experiment (-BLACK)
Type:	Shaft	Yield:	Less than 20 kt (each)
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: 9.8

^{133}Xe in curies:	7.0
$^{133\text{m}}\text{Xe}$ in curies:	3.0×10^{-1}
^{135}Xe in curies:	2.5

Release Summary: Nineteen intermittent drillback releases occurred from the vent line beginning on February 26, 1989, and lasting through March 1, 1989, with a total release time of 6.9 hours.

References: (E) (H) (X) (BC) (CY) (T1)

Detonations: **PALISADE-1, -2, -3** (simultaneous, same hole)

Date:	05/15/89	Sponsor:	LLNL
Time:	0610 PDT	Depth of Burial:	1,132 ft, 1,286 ft, 1,326 ft
Location:	NTS U4at	Purpose:	Weapons Related (-1) Safety Experiment (-2 and -3)
Type:	Shaft	Yield:	Less than 20 kt (each)
Release Detected:	Onsite Only	Type of Release:	Gas Sampling

Gas Sampling Release Activity at Time of Release, in Curies: 2.4

^{133}Xe in curies: 1.0

^{135}Xe in curies: 1.4

Release Summary: A gas sampling operation release occurred from the drilling platform at 1327 hours on May 17, 1989, and lasted for 36 minutes.

References: (E) (H) (X) (BC) (T1) (T2)

Test: **DISKO ELM**

Date:	09/14/89	Sponsor:	DoD/LLNL
Time:	0800 PDT	Depth of Burial:	857 ft
Location:	NTS U12p.03	Purpose:	Weapons Effects
Type:	Tunnel	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Controlled and Gas Sampling

Controlled Release Activity at Time of Release, in Curies: $4.8 \times 10^{-1}*$

Controlled Release Activity at R+12 Hours, in Curies: 4.2×10^{-1}

Isotopes Identified in the Release: ^{85}Kr , ^{131m}Xe , ^{133}Xe , ^{133m}Xe , and ^{135}Xe

Gas Sampling Release Activity at Time of Release, in Curies: 4.7×10^{-1}

^{127}Xe in curies: 3.2×10^{-5}

^{129m}Xe in curies: 2.1×10^{-3}

^{131m}Xe in curies: 2.3×10^{-1}

^{133}Xe in curies: 3.7×10^1
 $^{133\text{m}}\text{Xe}$ in curies: 6.2×10^{-1}
 ^{37}Ar in curies: 8.9
 ^{39}Ar in curies: 1.5×10^{-3}
 ^{85}Kr in curies: 2.8×10^{-2}

Release Summary: Controlled releases occurred as follows: (1) on September 18-19, 1989, from 0950 to 1000 hours from the LOS drift when effluent was filtered before being released to the environment; (2) on October 23, 1989, and January 10, 1990, when various sections of the LOS pipe were purged into the tunnel ventilation system; and (3)** during an experimental gas diagnostics program, on an intermittent basis, from September 25 to December 12, 1989.

In addition, small amounts of effluent ^{85}Kr were released during reentry mining operations between March 27, and April 17, 1990. These releases did not add significantly to the total release of radioactivity associated with the DISKO ELM test.

References: (E) (H) (K) (BC) (CE) (CF) (T0)

*Totals include both filtered and unfiltered releases.

**These releases were unfiltered, but controlled. Experience gained from the MISTY ECHO experimental gas diagnostics program indicated that only noble gases would be released.

BARNWELL			
Date:	12/08/89	Sponsor:	LLNL/UK
Time:	0700 PST	Depth of Burial:	1,971 ft
Location:	NTS U20az	Purpose:	Joint US-UK
Type:	Shaft	Yield:	20 to 150 kt
Release Detected:	Onsite Only	Type of Release:	Drillback and Late-Time Seepage

Drillback Release Activity at Time of Release, in Curies: 5.7×10^{-2}

^{133}Xe in curies: 5.6×10^{-2}
 $^{133\text{m}}\text{Xe}$ in curies: 1.4×10^{-3}
 ^{135}Xe in curies: 6.0×10^{-5}

Natural, Late-Time Seepage Activity at Time of Release, in Curies: 4.7×10^1

$^{131\text{m}}\text{Xe}$ in curies: 1.2
 ^{133}Xe in curies: 4.1×10^1

^{133m}Xe in curies: 6.4×10^{-2}

^{85}Kr in curies: 4.3

Release Summary: A drillback release occurred from the vent line on December 14, 1989, lasting for four minutes.

Seepage began on December 17, 1989, at approximately 1820 hours and continued until March 7, 1990.

References: (E) (H) (X) (BD) (T1) (T3)

Test:	METROPOLIS		
Date:	03/10/90	Sponsor:	LLNL
Time:	0800 PST	Depth of Burial:	1,540 ft
Location:	NTS U2gh	Purpose:	Weapons Related
Type:	Shaft	Yield:	20 to 150 kt
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: 5.9

^{133}Xe in curies: 5.7

^{133m}Xe in curies: 1.8×10^{-1}

^{135}Xe in curies: 7.7×10^{-2}

^{131}I in curies: 8.8×10^{-5}

^{133}I in curies: 1.9×10^{-4}

Release Summary: Drillback releases occurred as follows: (1) from the drilling platform intermittently between March 12-14, 1990, and (2) from the ventilation line March 14-15, 1990, when nine intermittent releases lasted for approximately one hour.

References: (E) (BD) (CM) (CN) (CO) (T6)

Detonation:	MINERAL QUARRY (simultaneous with RANDSBURG, separate drifts)		
Date:	07/25/90	Sponsor:	DoD/LANL
Time:	0800 PDT	Depth of Burial:	1,278 ft
Location:	NTS U12n.22	Purpose:	Weapons Effects
Type:	Tunnel	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Controlled and Gas Sampling

Controlled Release Activity at Time of Release, in Curies: 4.5×10^{-1} *

Isotopes Identified in the Release: ^{37}Ar , ^{39}Ar , ^{85}Kr , ^{131}I , $^{131\text{m}}\text{Xe}$, ^{133}Xe , and $^{133\text{m}}\text{Xe}$

Gas Sampling Release Activity at Time of Release, in Curies: 2.4^{}**

$^{131\text{m}}\text{Xe}$ in curies: 5.2×10^{-2}

^{133}Xe in curies: 9.3×10^{-2}

^{37}Ar in curies: 2.2

^{39}Ar in curies: 1.2×10^{-3}

^{85}Kr in curies: 7.3×10^{-2}

Release Summary: Controlled ventilation occurred as follows: (1) from the LOS pipe between the tunnel and pipe seal (TAPS) and the gas seal auxiliary closure (GSAC) on August 16, 1990, from 0840 hours until August 17, 1990, at 0640 hours, and (2) from drilling and sampling of cavity gases intermittently between October 1 and December 5, 1990.

The effluent from the LOS pipe was not filtered before being introduced into the tunnel ventilation system, while effluent from drilling and cavity sampling was passed through a high-efficiency particulate air (HEPA) filter and a charcoal filter combination before being released.

Sampling of cavity gases was part of an experimental gas diagnostics program. The gas released during this operation was from purging the sampling line to ensure a representative sample, and therefore represents the upper limit of the radioactive effluent released.

References: (E) (BD) (CG) (T8)

*Released from ventilation of the LOS pipe between the tunnel and pipe seal and the gas seal auxiliary closure.

**Total includes releases from drilling.

Test:	TENABO		
Date:	10/12/90	Sponsor:	LLNL
Time:	1030 PDT	Depth of Burial:	1,969 ft
Location:	NTS U20bb	Purpose:	Weapons Related
Type:	Shaft	Yield:	20 to 150 kt
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: 1.2×10^{-3}

^{133}Xe in curies: 2.4×10^{-5}

^{131}I in curies: 1.2×10^{-3}

Release Summary: Drillback releases (xenon-133) occurred from the drilling platform at 0032 hours on October 19, 1990, lasting for two minutes, and at 0250 hours lasting for one minute. Iodine-131 was also released intermittently from the drilling platform from October 18-30, 1990.

References: (E) (BE) (CK) (CL) (T6)

Test:	HOUSTON		
Date:	11/14/90	Sponsor:	LANL/UK
Time:	1117 PST	Depth of Burial:	1,950 ft
Location:	NTS U19az	Purpose:	Joint US-UK
Type:	Shaft	Yield:	20 to 150 kt
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: 1.0×10^{-4}

^{133}Xe in curies: 1.0×10^{-4}

Release Summary: A release occurred on November 23, 1990, and continued intermittently until December 28, 1990, after drillback operations were completed, but before cementback operations began.

References: (E) (BE) (T7)

Test:	BEXAR		
Date:	04/04/91	Sponsor:	LANL
Time:	1100 PST	Depth of Burial:	2,066 ft
Location:	NTS U19ba	Purpose:	Weapons Related
Type:	Shaft	Yield:	20 to 150 kt
Release Detected:	Onsite Only	Type of Release:	Cementback

Cementback Release Activity at Time of Release, in Curies: 5.0×10^{-1}

^{133}Xe in curies: 5.0×10^{-1}

^{131}I in curies: 1.0×10^{-4}

Release Summary: A release occurred during cementback operations on April 14, 1991, lasting for 10 days.

References: (E) (BE) (S0)

Test:	DISTANT ZENITH		
Date:	09/19/91	Sponsor:	DoD/LANL
Time:	0930 PDT	Depth of Burial:	865 ft
Location:	NTS U12p.04	Purpose:	Weapons Effects
Type:	Tunnel	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Controlled and Gas Sampling

Controlled Release Activity at Time of Release, in Curies: $4.1 \times 10^{-1}^*$

Isotopes Detected in the Release: ^{37}Ar , ^{39}Ar , ^{85}Kr , ^{127}Xe , $^{129\text{m}}\text{Xe}$, $^{131\text{m}}\text{Xe}$, ^{133}Xe , and $^{133\text{m}}\text{Xe}$

Gas Sampling Release Activity at Time of Release, in Curies: 3.7^{**}

^{127}Xe in curies:	3.6×10^{-6}
$^{131\text{m}}\text{Xe}$ in curies:	2.0×10^{-3}
^{133}Xe in curies:	3.5×10^{-2}
^{37}Ar in curies:	2.4
^{39}Ar in curies:	1.8×10^{-4}
^{85}Kr in curies:	1.3
tritiated water in curies:	1.4×10^{-5}

Release Summary: Controlled filtered ventilations of the LOS pipe occurred as follows: (1) between the TAPS and the GSAC on October 8, 1991, lasting for 5.5 hours, and (2) between the GSAC and the fast acting closure (FAC) on March 17, 1992, lasting for 9.5 hours.

In addition, filtered releases of radioactivity occurred intermittently during gas sampling operations, as part of an experimental gas diagnostics program, between October 28 and December 17, 1991.

Release of noble gas occurred during operations when six probe holes were drilled to determine the size and shape of the chimney produced by the test. These releases occurred between May 12 and May 29, 1992. Because this work was done more than six months after test execution, the effluent released from these probe holes was not filtered.

References: (E) (BE) (CH) (S1)

*Released from ventilation of the LOS pipe between the tunnel and pipe seal and the fast acting closure.

**Total includes releases from probe hole drilling and related operations.

Test:	LUBBOCK		
Date:	10/18/91	Sponsor:	LANL
Time:	1213 PDT	Depth of Burial:	1,500 ft
Location:	NTS U3mt	Purpose:	Weapons Related
Type:	Shaft	Yield:	20 to 150 kt
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: 8.3×10^{-2}

^{133}Xe in curies: 8.3×10^{-2}

Release Summary: Xenon-133 was released during instrument calibration. The calibration began at 0800 hours on November 19, 1991, and lasted for six hours.

References: (E) (BF) (S0)

Test:	DIAMOND FORTUNE		
Date:	04/30/92	Sponsor:	DoD/LANL
Time:	0930 PDT	Depth of Burial:	776 ft
Location:	NTS U12p.05	Purpose:	Weapons Effects
Type:	Tunnel	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Controlled

Controlled Release Activity at Time of Release, in Curies: 2.4×10^{-1}

Isotopes Detected in the Release: ^{131}I and ^{133}Xe

Release Summary: A controlled release through the tunnel ventilation system occurred intermittently between May 4 and July 2, 1992.

References: (E) (BF) (CI) (S2)

Test:	HUNTERS TROPHY		
Date:	09/18/92	Sponsor:	DoD/LLNL
Time:	1000 PDT	Depth of Burial:	1,264 ft
Location:	NTS U12n.24	Purpose:	Weapons Effects
Type:	Tunnel	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Gas Sampling

Gas Sampling Release Activity at Time of Release in Curies: 9.1×10^{-1}

^{127}Xe in curies:	5.7×10^{-6}
$^{129\text{m}}\text{Xe}$ in curies:	2.4×10^{-5}
$^{131\text{m}}\text{Xe}$ in curies:	1.5×10^{-2}
^{133}Xe in curies:	3.9×10^{-2}
^{37}Ar in curies:	7.9×10^{-1}
^{39}Ar in curies:	8.1×10^{-5}
^{85}Kr in curies:	1.3×10^{-2}
^3H in curies:	5.0×10^{-2}
tritiated water in curies:	1.8×10^{-5}

Release Summary: Releases during drilling operations occurred as follows: (1) on November 18, 1992, beginning at 2100 hours and lasting for two hours and (2) on November 19, 1992, beginning at 0845 hours and lasting for two hours. During gas sampling operations, there were six intermittent releases between November 19, 1992, and January 5, 1993. Each release lasted less than 0.5 hours.

Effluent was passed through a HEPA and charcoal filter combination before being released through the tunnel ventilation system. Releases of radioactivity during gas sampling operations were part of an experimental gas diagnostics program.

References: (E) (BF) (CJ) (S2)

Test:	DIVIDER		
Date:	09/23/92	Sponsor:	LANL
Time:	0804 PDT	Depth of Burial:	1,397 ft
Location:	NTS U3ml	Purpose:	Weapons Related
Type:	Shaft	Yield:	Less than 20 kt
Release Detected:	Onsite Only	Type of Release:	Drillback

Drillback Release Activity at Time of Release, in Curies: 1.1×10^{-1}

^{133}Xe in curies:	1.1×10^{-1}
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Release Summary: Xenon-133 was released during instrument calibration. Calibration began at 1000 hours on October 14, 1992, and lasted for four hours.

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GLOSSARY

Activity	The rate of decay of radioactive material expressed as the number of nuclear disintegrations per second (See curie).
Background Radiation	Radiation arising from radioactive material other than the one directly under consideration. Background radiation due to cosmic rays and natural radioactivity is always present.
Beta Particle	Charged particle emitted from the nucleus of an atom as part of the decay process, with a mass and charge equal in magnitude to that of the electron.
Cementback	Operation whereby the drill hole is sealed with a plug and cemented to the surface.
Controlled Release	A planned, filtered release frequently performed to reduce airborne radiation levels in the working environment.
Cable Pull	Recovery of a cable placed near a nuclear explosion. The cable ran to the surface and was pulled free shortly after zero time. The debris captured on the bottom end of the cable was analyzed to assess device performance.
Catcher Pull	Recovery of a debris catcher, placed near a nuclear explosive, by pulling on the attached cable and thus returning the catcher to the ground surface. This operation is usually accomplished within minutes to hours of zero time.
Crater	A nuclear device placed shallow enough underground to produce a throw-out of earth when exploded.
Curie (Ci)	A unit of activity where 1 curie is defined as 3.7×10^{10} disintegrations per second.
Detonation	A single nuclear device explosion; one or more comprise a test.
Drillback	Directional drilling operation, performed after the test activities have ceased, to sample fission product materials in the test cavity.
Exposure Rate	A measure of the ionization produced in air by x or gamma radiation per unit of time (frequently expressed in R/hr or mR/hr).
Gamma	High energy electromagnetic radiations produced during the disintegration of radioactive elements.
Gas Sampling	Operation usually performed after test activities have ceased to determine levels of noble gases present.
Gross Beta	Measure of the total beta activity.
H Hour	Detonation time (zero hour), the time the device was detonated.

GLOSSARY (Continued)

Intermediate	The nomenclature for test yields varied according to information policy governing specific years. From 1945 through 1963, "Intermediate" referred to test yields from 20 to 200 kt.
Isotopes	Forms of the same element having the same number of protons, but different numbers of neutrons.
Joint US-UK	A nuclear test conducted jointly by the United States and the United Kingdom under a cooperative agreement in effect between the two countries since August 4, 1958.
kt	A kiloton. The energy of a nuclear explosion that is equivalent to an explosion of 1,000 tons of TNT.
Late-Time Seepage	A slow release of gases from test detonation sites, that could exist from a few hours to even weeks after all other operations in the area have ceased (as defined for the purpose of this report).
Low	The nomenclature for test yields varied according to information policy governing specific years. From 1945 through 1963, "Low" referred to test yields less than 20 kt.
Milliroentgen (mR)	One-thousandth of a roentgen.
Offsite	The detection of radioactivity offsite is defined as detected outside the Test Range Complex, an area that includes both the Nevada Test Site and the adjacent government-controlled Nellis Air Force Range.
Onsite	A notation that radioactivity was detected onsite only is made for tests from which there was a release of radioactivity into the atmosphere that was not detected beyond the boundaries of the Test Range Complex.
Picocurie	1×10^{-12} curie.
Plowshare	Application of nuclear explosives to develop peaceful uses for atomic energy. The program is no longer active.
Radiation	The emission and propagation of energy through space or through a material medium in the form of waves and/or particles. Only alpha, beta, gamma, x-ray, and neutron emissions resulting from nuclear detonations and detonation products are intended herein.
Radioactivity	The property of unstable nuclei of atoms of emitting particles or rays in the process of becoming stable.
Roentgen (R)	A special unit of exposure to ionizing radiation. It is that amount of gamma or x rays required to produce one electrostatic unit of charge of either sign per cubic centimeter of air at standard temperature and pressure.

GLOSSARY (Continued)

Safety Experiment	Experiment designed to confirm a nuclear explosion will not occur in case of an accidental detonation of the explosive associated with the device.
Shaft	A nuclear device exploded at the bottom of a drilled or mined vertical hole.
Storage-Transportation	Detonations of combinations of high explosives and nuclear materials designed to study distribution of nuclear material during accidents in several transportation and storage configurations.
Surface	A nuclear device placed on or close to the earth's surface.
Test	A test is defined in the Threshold Test Ban Treaty as either a single underground nuclear explosion conducted at a test site, or two or more underground nuclear explosions conducted within an area delineated by a circle having a diameter of two kilometers and conducted within a total period of time not to exceed 0.1 second.
Test Range Complex	An area that includes both the Nevada Test Site and the adjacent government-controlled Nellis Air Force Range.
Tunnel	A nuclear device exploded at the end of a long horizontal drift mined into a mountain or mesa in a way that places the burst point deep within the earth.
Uncontrolled Release	A spontaneous release occurring after a test, but before postshot drilling operations commence. For this report, this term is used when referring to tunnel tests.
Underground (UG)	Underground nuclear test conducted in a tunnel or at the bottom of a drilled hole or shaft. Some underground nuclear tests were not designed to contain all radioactivity; e.g., cratering tests or safety experiments.
Vela Uniform	Department of Defense program designed to improve the capability to detect, identify, and locate underground nuclear explosions.
Vent Line	Ventilation tubing, either steel or plastic, that is used to conduct the air into or out of the underground excavations and through the fans.
Venting	A rapid release of gaseous and particulate matter into the atmosphere, usually within minutes of an underground explosion.
Weapons Effects	A nuclear test to evaluate the civil or military effects of a nuclear detonation on various targets, such as military hardware.
Weapons Related	A nuclear detonation conducted for the purpose of testing a nuclear device intended for a specific type of weapon system.

GLOSSARY (Continued)

Yield

The total effective energy released in a nuclear explosion. It is usually expressed in terms of equivalent tonnage of TNT required to produce the same energy release in an explosion.

ACRONYMS

ARPA	Advanced Research Projects Agency
DNA	Defense Nuclear Agency, an organization within DoD
DoD	Department of Defense
EPA	Environmental Protection Agency, established in December 1970
LANL	Los Alamos National Laboratory. U.S. Government laboratory located in Los Alamos, New Mexico
LASL	Los Alamos Scientific Laboratory, became LANL on January 1, 1981
LLL	Lawrence Livermore Laboratory, became LLNL on February 29, 1980
LLNL	Lawrence Livermore National Laboratory. U.S. Government Laboratory located in Livermore, California
LRL	Lawrence Radiation Laboratory, became LLL in July 1971
NAFR	Nellis Air Force Range
NTS	Nevada Test Site. A 1,350-square-mile area in Nye County, Nevada, located about 65 miles northwest of Las Vegas
PHS	U.S. Public Health Service, whose radiation monitoring functions were taken over by the EPA in 1970
REECo	Reynolds Electrical & Engineering Company, Incorporated
SC	Sandia Corporation, became SL on July 31, 1970
SL	Sandia Laboratory, became SNL on February 29, 1980
SNL	Sandia National Laboratories, U.S. Government laboratories located in Albuquerque, New Mexico and Livermore, California
UK	United Kingdom