**U.S. DEPARTMENT OF ENERGY
NEVADA OPERATIONS OFFICE
ENVIRONMENTAL MONITORING PROGRAM
SUMMARY DATA REPORT
FIRST CALENDAR QUARTER
1997**

OCTOBER 1997

Work Performed Under
Contract No. DE-AC08-96NV11718

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Prepared for

Nevada Operations Office
U.S. Department of Energy

19980416 110

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Editors: Stuart C. Black, Orin L. Haworth, and Yvonne E. Townsend

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ACKNOWLEDGMENTS

Frank R. Grossman compiled and verified radiological onsite data, and Orin Haworth provided the non-radiological data. R. R. Kinnison provided the statistical analyses necessary for this report. The production of this report would not have been possible without the dedication, expertise, and professionalism of these individuals.

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LIST OF ACRONYMS

C.F.R.	Code of Federal Regulations
CX	Categorical Exclusion
CY	Calendar Year
DCG	Derived Concentration Guide
DOE	U.S. Department of Energy
DOE/NV	DOE Nevada Operations Office
EA	Environmental Assessment
EDE	Effective Dose Equivalent
EIS	Environmental Impact Statement
HTO	Tritiated Water
LANL	Los Alamos National Laboratory
MDC	Minimum Detectable Concentration
NEPA	National Environmental Policy Act
NTS	Nevada Test Site
RWMS	Radioactive Waste Management Site
RWMS-3	Radioactive Waste Management Site Area 3
RWMS-5	Radioactive Waste Management Site Area 5
SDWA	Safe Drinking Water Act
TLD	Thermoluminescent Dosimeter
TTR	Tonopah Test Range

1.0 RADIOLOGICAL ENVIRONMENTAL SURVEILLANCE

1.1 INTRODUCTION

The continuing moratorium on the testing of nuclear explosive devices, possibility of alternate uses for the Nevada Test Site (NTS), and reduced budget have led to significant changes in the extent of environmental surveillance activities on and around the NTS. Not only have the number of monitored locations been reduced since 1992, but also the frequency and types of analyses have been changed. The onsite radiological surveillance program is shown in **Table 1.1**, and this report gives the first quarter results for that program.

During the first calendar quarter of 1997, air samples were collected and analyzed from 45 air particulate sampling stations, 3 noble gas sampling stations, and 12 tritiated water (HTO) vapor sampling stations. Surface water samples were collected and analyzed from one wastewater containment pond and nine sewage lagoons. Groundwater samples were obtained from ten potable supply wells, one non-potable supply well, and seven drinking water distribution end points. Ambient radiation levels were measured at 168 locations. The sampling station locations are shown in **Figures 1.1, 1.2, and 1.3**. These activities were conducted in accordance with the schedule set forth in **Table 1.1**.

1.2 RADIOACTIVITY IN AIR

The 45 air particulate sampling stations were operated continuously both on the NTS and at offsite locations where airborne radioactivity is believed to be present. Forty-one of the stations were on the NTS, and four were offsite at locations where weapons safety tests were conducted. Samples were collected weekly on glass-fiber filters. After a delay of five to seven days (for radon progeny decay), the filters were counted for gamma, gross alpha, and gross beta activity, composited either monthly or quarterly and then analyzed for ^{238}Pu and $^{239+240}\text{Pu}$. The Radioactive Waste Management Site (RWMS) samples were not analyzed for gross alpha activity.

Samples for the noble gas ^{85}Kr were collected weekly at three fixed locations by compressing air into pressure tanks. A cryogenic distillation process separated the krypton gas from the air sample. It was dissolved in a scintillation cocktail and measured using liquid scintillation counting.

HTO vapor was monitored continuously at 12 locations. Samples were collected every two weeks on silica gel, and the water was extracted, distilled, and analyzed for ^3H by use of liquid scintillation counting.

Measured quantities of radioactivity are compared to the Derived Concentration Guides (DCG) found in U.S. Department of Energy (DOE) Order 5400.5 for limiting radiation exposure to the general public. The values used are listed in **Table 1.2**. In making these comparisons, the most restrictive DCG was used.

1.2.1 AIR PARTICULATE SAMPLING RESULTS

The analytical results available by the end of this quarter are discussed below.

Figure 1.1 Location of NTS Air Sampling Stations, 1997

Figure 1.2 Location of NTS Water Sampling Stations, 1997

Figure 1.3 Location of Thermoluminescent Dosimeters (TLDs) on the NTS, 1997

1.2.1.1 GROSS ALPHA/BETA AND GAMMA SPECTRAL ANALYSES

Air particulate samples were held for five to seven days prior to gross alpha/beta counting and gamma spectral analysis to allow for the decay of radon progeny. Summary data for gross beta/alpha and gamma spectral analyses results are shown in **Table 1.3**. All results exceeded their applicable minimum detectable concentration (MDC). Mean gross beta concentrations ranged from 1.3 to 2.4×10^{-14} $\mu\text{Ci/mL}$ (0.48 to 0.89 mBq/m^3), with a network mean concentration of 1.7×10^{-14} $\mu\text{Ci/mL}$ (0.63 mBq/m^3). This concentration is 1.9 percent of the DCG for ^{90}Sr in DOE Order 5400.5 and adjusted to an annual effective dose equivalent (EDE) of 10 mrem (0.1 mSv). The network mean is slightly lower than the values observed during the past few years (1989 - 1996), (see **Figure 1.4**). The gross alpha mean concentration for the network was 1.3×10^{-15} $\mu\text{Ci/mL}$ (48 $\mu\text{Bq/m}^3$), similar to the 1996 average. Gross alpha analyses were not done on RWMS air samples as mentioned above.

The glass-fiber filters used to collect particulates were analyzed by gamma spectroscopy. All radionuclides detected were naturally occurring in the environment (^{40}K , ^7Be , and members of the uranium and thorium series). The network mean concentration of ^7Be was 2.3×10^{-13} $\mu\text{Ci/mL}$ (8.5 mBq/m^3), similar to the averages for the last few years as shown in **Figure 1.5**.

1.2.1.2 NELLIS AIR FORCE RANGE COMPLEX SAMPLES

The samples collected and analyzed from Area 13 DOUBLE TRACKS and CLEAN SLATE sites were analyzed for gross alpha, gross beta, and gamma activity. The average gross beta result of 1.6×10^{-14} $\mu\text{Ci/mL}$ (0.59 mBq/m^3) is similar to the onsite average data, as is the ^7Be result of 2.4×10^{-13} $\mu\text{Ci/mL}$ (8.9 mBq/m^3), from gamma spectrometric analysis of the filters. However, the gross alpha results for these four samplers averaged 1.8×10^{-15} $\mu\text{Ci/mL}$ (67 $\mu\text{Bq/m}^3$), slightly higher than the onsite network average.

1.2.1.3 PLUTONIUM ANALYSES

Filters from each particulate sampling station, located on the boundary of the RWMS Area 5 (RWMS-5) (four stations) and RWMS Area 3 (RWMS-3) (four stations), were composited monthly and analyzed for ^{238}Pu and $^{239+240}\text{Pu}$. Filters from all other stations were composited quarterly and analyzed similarly. These analyses, for the first quarter of 1997, have not been completed for all stations and the results have not been validated.

1.2.2 NOBLE GAS (^{85}Kr) SAMPLING RESULTS

Noble gas analyses for the first quarter of calendar year (CY) 1997 have been completed and the results validated. The available results are shown in **Table 1.4**. The network average for the three stations sampled this quarter is 24.4 pCi/m^3 (0.9 Bq/m^3) of ^{85}Kr , which is slightly less than the annual average for the past several years, as shown in **Figure 1.6**. The two stations on Pahute Mesa had higher biweekly maximum detections than the station at BJY, but the annual average values were not statistically different.

1.2.3 TRITIATED WATER VAPOR

Summary data for HTO vapor sampling from the 12 active stations are shown in **Table 1.5**. Mean station concentrations ranged from 0.58 to 240×10^{-13} $\mu\text{Ci/mL}$ (2.1 to 890 mBq/m^3). The

Figure 1.4 Comparative Data for Gross Beta in Air on the NTS

Figure 1.5 Comparative Data for ⁷Be in Air on the NTS

Figure 1.6 Comparative Data for ⁸⁵Kr in Air on the NTS

Figure 1.7 Comparative Data for HTO in Air on the NTS

network mean concentration was 3.4×10^{-12} $\mu\text{Ci/mL}$ (130 mBq/m^3). This mean value was consistent with previous measurements, as shown in **Figure 7**. The highest mean value was measured at the RWMS-5 No. 8 station and was only 0.24 percent of the DCG for tritium, adjusted for an annual EDE of 10 mrem.

1.3 RADIOACTIVITY IN SURFACE WATER

Annual samples are taken at all open reservoirs and natural springs. Quarterly samples are taken at the containment ponds and sewage lagoons sampled. All samples are analyzed for gross beta activity, tritium, ^{238}Pu , $^{239+240}\text{Pu}$, ^{90}Sr , and gamma-emitting nuclides. Containment pond sampling was limited to Area 12 E Tunnel effluent, E Tunnel pond No. 2, and a pond at emplacement well U-3cn. Samples were collected from eight of the nine sewage lagoons.

1.3.1 CONTAINMENT PONDS

At the Area 12 E Tunnel complex, grab samples were taken from containment pond No. 2 and at the effluent discharge point. The results of analyses for these two samples are given in **Table 1.6**. During pumping postshot Well No. 2 at U-3cn, tritium was detected. The well effluent was pumped into a lined containment pond. A total of 10^5 gal ($3.78 \times 10^5 \text{ L}$) containing $13.5 \mu\text{Ci/L}$ of tritium was pumped into the pond.

The results for the E Tunnel complex are generally consistent with the results observed in the samples collected in 1996.

1.3.2 SEWAGE LAGOONS

Each of the lagoons is part of a closed system used for evaporative treatment of sanitary waste. The lagoons are located in Areas 6, 11, 12, 22, 23, and 25. Quarterly samples were taken and analyzed for gross beta activity, tritium, ^{238}Pu , $^{239+240}\text{Pu}$, and gamma-emitting nuclides. Summary data for sewage lagoons are shown in **Table 1.6**.

The gross beta concentrations ranged from 3.2 to $29 \times 10^{-9} \mu\text{Ci/mL}$ (0.12 to 1.2 Bq/L) with a network mean of $19 \times 10^{-9} \mu\text{Ci/mL}$ (0.7 Bq/L). All results were above the detection limit of $1.5 \times 10^{-9} \mu\text{Ci/mL}$ (0.06 Bq/L). The maximum station mean was at Area 6 Los Alamos National Laboratory (LANL) Pond. These results are consistent with previous data.

The tritium concentrations in sewage lagoon water samples were all less than the median MDC of 700 pCi/L (26 Bq/L), for conventional tritium analyses.

Station ^{238}Pu and $^{239+240}\text{Pu}$ maximum concentrations were $-0.0018 \times 10^{-9} \mu\text{Ci/mL}$ and $0.21 \times 10^{-9} \mu\text{Ci/mL}$ (-0.067 and 0.78 mBq/L), respectively. All of the ^{238}Pu and $^{239+240}\text{Pu}$ results, except for those at the LANL and Area 23 lagoons, were less than the median MDC, as has been observed previously.

Analyses are performed annually for ^{90}Sr in sewage lagoons. These analyses were not performed in this quarter of 1997.

All water samples were analyzed by gamma spectroscopy. The only radionuclides detected were naturally occurring in the environment (^{40}K , ^7Be , and members of the uranium and thorium series).

The results for sewage lagoons discussed above are comparable with past results, and the network means are within the ranges measured during the past six years.

1.4 RADIOACTIVITY IN SUPPLY WELL WATER

The NTS water system currently consists of 11 supply wells, 10 of which supply potable water to onsite distribution systems. One supply well, Well UE-5c in Area 5, supplies water for industrial purposes.

The potable supply wells are sampled quarterly and analyzed for gross alpha activity, gross beta activity, tritium (using enrichment procedure), ^{238}Pu , $^{239+240}\text{Pu}$, ^{90}Sr , $^{226+228}\text{Ra}$, and gamma-emitting nuclides. The pump for Area 6 Well C was broken in 1996, and this potable supply well has not been sampled since then. The non-potable well was also sampled quarterly and received the same analyses, except for tritium (standard liquid scintillation used) and $^{226+228}\text{Ra}$ (none). Summary data for these supply wells are given in **Table 1.6**.

1.4.1 GROSS BETA

The station values for gross beta for potable supply wells ranged from 2.7 to $12 \times 10^{-9} \mu\text{Ci/mL}$ (0.1 to 0.48 Bq/L), with a network mean of $7.0 \times 10^{-9} \mu\text{Ci/mL}$ (0.26 Bq/L). The gross beta result for the non-potable supply well was $6.7 \times 10^{-9} \mu\text{Ci/mL}$ (0.25 Bq/L). All results were above the detection limits. The maximum potable station value was at Area 5 Well 5B and was 4 percent of the Safe Drinking Water Act (SDWA) compliance limit for ^{40}K .

1.4.2 TRITIUM

The station values for tritium for potable supply wells ranged from 3.8 to $9.4 \times 10^{-9} \mu\text{Ci/mL}$ (0.14 to 0.35 Bq/L), with a network mean of $6.7 \times 10^{-9} \mu\text{Ci/mL}$ (0.23 Bq/L). The tritium result for the non-potable supply well was $6.2 \times 10^{-9} \mu\text{Ci/mL}$ (0.23 Bq/L). Most results were less than the detection limit. The maximum tritium value was at Well J-13 and was 0.01 percent of the SDWA compliance limit.

1.4.3 PLUTONIUM

The sample results for ^{238}Pu for all supply wells were less than the median MDC, as has usually been observed in these samples. There was only one result for $^{239+240}\text{Pu}$ that exceeded the detection limits. That result was $7.2 \times 10^{-11} \mu\text{Ci/mL}$ (2.7 mBq/L), at Well J-12 and is 7.2 percent of the SDWA limit.

1.4.4 GROSS ALPHA & RADIUM

The station values for gross alpha for potable supply wells ranged from 0.74 to $10 \times 10^{-9} \mu\text{Ci/mL}$ (27 to 370 mBq/L), with a network mean of $6.5 \times 10^{-9} \mu\text{Ci/mL}$ (240 mBq/L). The gross alpha value for the non-potable supply well was $10 \times 10^{-9} \mu\text{Ci/mL}$ (0.37 Bq/L). All results were above the detection limit. Several potable supply well results exceeded the SDWA screening level for gross alpha of 5 pCi/L .

The potable supply well values for ^{226}Ra ranged from -0.98 to 1.7×10^{-9} $\mu\text{Ci/mL}$ (-36 to 63 mBq/L), with a network mean of 1.4×10^{-9} $\mu\text{Ci/mL}$ (52 mBq/L). The network mean for ^{228}Ra of 0.22×10^{-9} $\mu\text{Ci/mL}$ (8 mBq/L) was less than the MDC, as were all individual well sample results. The highest ^{226}Ra result was at Well C-1. This result was 34 percent of the applicable adjusted DCG.

1.4.5 STRONTIUM

The maximum station value for potable supply wells for ^{90}Sr was 0.14×10^{-9} $\mu\text{Ci/mL}$ (5.2 mBq/L), but the network mean was less than the MDC for analysis. The result for the industrial supply well was also less than the MDC. All results were below the detection limits.

1.4.6 GAMMA SPECTROSCOPY

All water samples were analyzed by gamma spectroscopy. The only radionuclides detected were naturally occurring in the environment (^{40}K , ^7Be , and members of the uranium and thorium series).

The results for supply wells discussed above are generally comparable with past results. Network means were within the range of means measured during the past six years, except for the ^{90}Sr concentrations, which are generally lower than have been observed previously.

1.5 RADIOACTIVITY IN DRINKING WATER

As a check on any effect the water distribution system might have on water quality, seven drinking water distribution end-points (tap water) were sampled.

These end-points are sampled quarterly at convenient water taps and analyzed for gross alpha and beta activity, tritium, ^{238}Pu , $^{239+240}\text{Pu}$, and gamma-emitting nuclides. Summary data for the tap water are given in **Table 1.7**. Results greater than their detection limit are compared to the DCGs in DOE 5400.5 as adjusted to meet federal SDWA regulations, or SDWA compliance or screening levels.

1.5.1 GROSS BETA

The tap water values for gross beta ranged from 2.9 to 9.2×10^{-9} $\mu\text{Ci/mL}$ (0.1 to 0.33 Bq/L), with a network mean of 5.9×10^{-9} $\mu\text{Ci/mL}$ (0.22 Bq/L). All values were above the detection limits. The maximum tap water value, at Area 25 Building 4221 was 3 percent of the SDWA compliance limit, based on the ^{40}K limit. All results were almost identical to the 1996 values.

1.5.2 TRITIUM

The station values for tritium ranged from -130 to 240×10^{-9} $\mu\text{Ci/mL}$ (-4.8 to 8.9 Bq/L), with a network mean of 28×10^{-9} $\mu\text{Ci/mL}$ (1.0 Bq/L). All results were less than the detection limits.

1.5.3 PLUTONIUM

All concentrations of both $^{239+240}\text{Pu}$ and ^{238}Pu were less than the respective median MDCs, as has been observed in previous samples for this network.

1.5.4 GROSS ALPHA

The sample results for gross alpha ranged from 0.35 to 7.6×10^{-9} $\mu\text{Ci/mL}$ (0.13 to 0.28 Bq/L), with a network mean of 4.7×10^{-9} $\mu\text{Ci/mL}$ (0.17 Bq/L), similar to the 1996 data. All results were above the detection limit, except for Building 12-23.

1.5.5 STRONTIUM

Analyses are performed annually for ^{90}Sr in consumption end-points and were not done this quarter.

1.5.6 GAMMA SPECTROSCOPY

All water samples were analyzed by gamma spectroscopy. The only radionuclides detected were naturally occurring in the environment (^{40}K , ^7Be , and members of the uranium and thorium series).

The results for tap water samples discussed above are generally comparable with past results. All network means are within the range of means measured during the past few years.

2.0 NON-RADIOLOGICAL EFFLUENT MONITORING

2.1 DRINKING WATER SYSTEMS

Water sampling was conducted for analysis of bacteria in the water as required by the federal SDWA and state of Nevada regulations. Samples were taken at various locations throughout all drinking water distribution systems on the NTS. Common sampling points were restrooms and cafeteria sinks. Samples were also collected this quarter for inorganic and organic analyses. All analyses were performed in accordance with Nevada Administrative Code 445A.450 ff. and Title 40 C.F.R. Part 141.

2.1.1 BACTERIOLOGICAL SAMPLING

All water systems were tested once a month, with the number of people being served, determining the number of samples collected. All samples were analyzed for the presence of coliform bacteria. Residual chlorine analyses are no longer required by the state.

No coliform bacteria were detected in any sample collected during the first quarter of 1997.

2.1.2 CHEMICAL ANALYSIS

During the first quarter of 1997, all systems were sampled and analyzed for nitrates, lead, and copper. All sample results were below the maximum concentration levels, but nitrate levels in the two Area 25 wells exceeded the action level of 5 ppm for nitrate. As a result, samples will have to be collected and analyzed for nitrate in each of the next four quarters.

Also this quarter, Wells 4a and 5b were sampled for volatile organic compounds, and all results were satisfactory. The wells in Area 25 were also sampled for fluoride, as required by a waiver granted by the state. The fluoride results were all acceptable.

2.2 SEWAGE LAGOONS

During the first quarter of 1997, sampling was conducted for sewage lagoon systems at the NTS, in accordance with state of Nevada General Permit, GNEV93001. Water parameters monitored included water depth in infiltration basins, monitoring of influent quality, and organic loading rates in sewage lagoons. The results for water depth measurements are shown in **Table 1.8**, influent quality data are shown in **Table 1.9**, and the results of organic loading rates are shown in **Table 1.10**. The results and data in these three tables are all within permit limits.

The permit also requires sampling and analysis of infiltration basins which contain 30 cm or more of liquid in January and June of any year. The Area 6 Yucca Lake facility level exceeded the 30 cm limit during January of this year. The analytic results were all below compliance limits and are shown in **Table 1.11**.

2.3 NON-HAZARDOUS SOLID WASTE DISPOSAL

Monitoring of the three sanitary landfills was limited to recording daily refuse amounts by weight. All waste disposed of in the Area 23 landfill was weighed at the Gate 100 weighing station. Waste disposed of in the Area 9 10c crater landfill was weighed at the landfill site. Approximately 1,785 tons of waste were disposed of in the Areas 6, 9, and 23 sanitary landfills during the first quarter of 1997, as shown in **Table 1.12**.

3.0 NATIONAL ENVIRONMENTAL POLICY ACT

The National Environmental Policy Act (NEPA) of 1969 requires all federal facilities, including the NTS, to account for environmental impacts and potential alternatives in conducting and planning their operations. In accordance with NEPA, DOE Nevada Operations Office (DOE/NV) activities are evaluated for their potential environmental impacts and to ensure that the proper level of NEPA documentation is initiated. During the first quarter of 1997, NTS-related NEPA activities included actions on three Environmental Impact Statements (EISs), five Environmental Assessments (EAs), and seven Categorical Exclusions (CXs). Of these, six CXs were initiated in the first quarter of 1997. These NEPA documents are listed in chronological order in **Table 1.13**, with their assigned number and present status.

4.0 OCCURRENCE REPORTING

Occurrences are environmental, health, and/or safety-related events which are reported in several categories in accordance with the requirements of DOE Order 5000.3B. One Environmental Occurrence was reported for NTS facilities during the first quarter of 1997. Details for this occurrence, including report number, description, and status, appear in **Table 1.14**.

TABLES

Table 1.1 Network Collection and Analysis Data

Network	Media	No.	Frequency of Analyses			
			Weekly	Monthly	Quarterly	Annually
Air	Particulate	28	α, β, γ		Pu	
	On Nellis Range	4	α, β, γ		Pu	
	RWMS	13	β, γ	Pu		
	Tritium	12		Bi-weekly		
	Noble Gas	3	^{85}Kr			
Water	Reservoir	15				$\beta, \gamma, ^3\text{H}, \text{Sr}, \text{Pu}$
	Springs	8				$\beta, \gamma, ^3\text{H}, \text{Sr}, \text{Pu}$
	Wells	12			$\beta, \gamma, \alpha, ^3\text{H}, \text{Sr}$ $\text{Pu}, ^{226}, ^{228}\text{Ra}$	
	Spigot	7			$\beta, \gamma, \alpha, ^3\text{H}, \text{Pu}$	Sr
	Sewage	9			$\beta, \gamma, ^3\text{H}, \text{Pu}$	Sr
	Pond	2			$\beta, \gamma, ^3\text{H}, \text{Pu}$	Sr
TLD	Environment	168		γ		

Table 1.2 Derived Limits for Radionuclides in Air and Water

Radionuclide	$\mu\text{Ci/mL}$	
	DCG (air) ^(a)	DCG (water) ^(b)
^3H	1×10^{-08}	8×10^{-5}
^{40}K	9×10^{-11}	3×10^{-7}
^{85}Kr	$3 \times 10^{-7(c)}$	--
^{90}Sr	9×10^{-13}	4×10^{-8}
$^{226}\text{Ra}/^{228}\text{Ra}$	1×10^{-13}	4×10^{-9}
^{238}Pu	3×10^{-15}	2×10^{-9}
$^{239+240}\text{Pu}$	2×10^{-15}	1×10^{-9}

(a) DCG - Derived Concentration Guides are reference values for conducting radiological protection programs at operational DOE facilities and sites. The DCG values for air are for an EDE of 10 mrem (0.1 mSv) (inhalation) for a year as required by Title 40 C.F.R. 61.92 and DOE Order 5400.5.

(b) The values listed for beta and photon emitters in the table are based on 4 mrem committed EDE for the radionuclide taken into the body by ingestion of water during one year (730 L). Gross beta levels less than or equal to 50 pCi/L are in compliance with Title 40 C.F.R. 141, SDWA.

(c) Nonstochastic value.

Table 1.3 Average Gross Alpha, Gross Beta, and ^7Be in Air ($\mu\text{Ci/mL}$) - First Quarter, CY 1997

<u>Location</u>	<u>Gross α</u>	<u>Gross β</u>	<u>Beryllium-7</u>
Area 1 BJY	1.2×10^{-15}	1.7×10^{-14}	2.4×10^{-13}
Area 2	1.3×10^{-15}	1.7×10^{-14}	2.5×10^{-13}
Area 2-1 Substation	1.2×10^{-15}	1.6×10^{-14}	2.2×10^{-13}
Area 3 Mudplant	1.3×10^{-15}	1.7×10^{-14}	2.2×10^{-13}
Area 3 U-3ah/at S		1.5×10^{-14}	2.0×10^{-13}
Area 3 U-3ah/at E		1.6×10^{-14}	2.3×10^{-13}
Area 3 U-3ah/at N		1.8×10^{-14}	2.6×10^{-13}
Area 3 U-3ah/at W		1.5×10^{-14}	2.2×10^{-13}
Area 3 Well ER-3-1	1.4×10^{-15}	1.8×10^{-14}	2.4×10^{-13}
Area 4 Bunker T-4	1.3×10^{-15}	1.8×10^{-14}	2.5×10^{-13}
Area 5 RWMS#1		1.7×10^{-14}	2.4×10^{-13}
Area 5 RWMS#4		2.0×10^{-14}	2.7×10^{-13}
Area 5 RWMS#6		1.8×10^{-14}	2.6×10^{-13}
Area 5 RWMS#8		1.9×10^{-14}	2.8×10^{-13}
Area 5 RWMS Pit-5		1.9×10^{-14}	2.4×10^{-13}
Area 5 TRU Building N		2.4×10^{-14}	2.7×10^{-13}
Area 5 TRU Building S		1.9×10^{-14}	2.1×10^{-13}
Area 5 WEF S	1.8×10^{-15}	1.8×10^{-14}	2.2×10^{-13}
Area 5 WEF N	1.4×10^{-15}	1.8×10^{-14}	2.3×10^{-13}
Area 5 DOD	1.1×10^{-15}	1.4×10^{-14}	1.9×10^{-13}
Area 5 Well 5B	1.5×10^{-15}	2.1×10^{-14}	2.5×10^{-13}
Area 6 YUCCA	1.4×10^{-15}	1.9×10^{-14}	2.5×10^{-13}
Area 6 CP-6	1.3×10^{-15}	1.8×10^{-14}	2.3×10^{-13}
Area 6 Well 3	1.4×10^{-15}	1.9×10^{-14}	2.7×10^{-13}
Area 7 UE-7ns	1.1×10^{-15}	1.6×10^{-14}	2.3×10^{-13}
Area 9-300	1.4×10^{-15}	1.7×10^{-14}	2.3×10^{-13}
Area 10 Gate 700 S	1.3×10^{-15}	1.8×10^{-14}	2.8×10^{-13}
Area 10 SEDAN Crater	1.1×10^{-15}	1.7×10^{-14}	2.5×10^{-13}
Area 11 Gate 293	1.1×10^{-15}	1.7×10^{-14}	2.2×10^{-13}
Area 12	1.0×10^{-15}	1.5×10^{-14}	2.1×10^{-13}
Area 15 EPA Farm	1.1×10^{-15}	1.6×10^{-14}	2.2×10^{-13}
Area 16 3545 Substation	1.0×10^{-15}	1.6×10^{-14}	2.5×10^{-13}
Area 18 Well UE-18t	1.3×10^{-15}	1.6×10^{-14}	2.4×10^{-13}
Area 20 SCHOONER	1.1×10^{-15}	1.6×10^{-14}	2.2×10^{-13}
Area 20 CABRIOLET	1.9×10^{-15}	1.6×10^{-14}	2.2×10^{-15}
Area 20	1.0×10^{-15}	1.3×10^{-14}	2.0×10^{-13}
Area 23 Building 790#2	1.3×10^{-15}	1.8×10^{-14}	2.4×10^{-13}
Area 23 H&S Building	1.2×10^{-15}	1.7×10^{-14}	2.4×10^{-13}
Area 25 E-MAD N	1.2×10^{-15}	1.6×10^{-14}	2.3×10^{-13}
Area 25 NRDS	1.3×10^{-15}	1.8×10^{-14}	2.6×10^{-13}
Area 27	1.6×10^{-15}	1.4×10^{-14}	2.2×10^{-13}
Network Averages	1.3×10^{-15}	1.7×10^{-14}	2.3×10^{-13}
Average MDC	9.9×10^{-16}	2.7×10^{-15}	7.9×10^{-14}

Table 1.4 Offsite Particulate and Onsite ⁸⁵Kr in Air Summary Data - First Quarter, CY 1997

OFFSITE PARTICULATE RESULTS (μCi/mL)

<u>Location</u>	<u>Gross Alpha</u>	<u>Gross Beta</u>	<u>Beryllium-7</u>
Area 13 Project 57	1.6×10^{-15}	1.7×10^{-14}	2.2×10^{-13}
Area 52 DOUBLE TRACKS	1.7×10^{-15}	1.6×10^{-14}	2.2×10^{-13}
TTR CLEAN SLATE I	1.7×10^{-15}	1.7×10^{-14}	2.6×10^{-13}
TTR CLEAN SLATE III	2.0×10^{-15}	1.6×10^{-14}	2.4×10^{-13}
Average	1.8×10^{-15}	1.6×10^{-14}	2.4×10^{-13}
Average MDC	9.9×10^{-16}	2.7×10^{-15}	7.9×10^{-14}

ONSITE KRYPTON-85 RESULTS (μCi/mL)

<u>Location</u>	<u>Average</u>	<u>Maximum</u>	<u>Minimum</u>
Area 1 BJY	3.0×10^{-11}	3.5×10^{-11}	1.6×10^{-11}
Area 19 Pahute Substa	2.5×10^{-11}	3.8×10^{-11}	9.2×10^{-12}
Area 20 Camp	2.9×10^{-11}	4.1×10^{-11}	4.4×10^{-12}
All Sites	2.8×10^{-11}	4.1×10^{-11}	4.4×10^{-12}

Table 1.5 Tritium in Atmospheric Moisture Summary Data (μCi/mL) - First Quarter, CY 1997

<u>Location</u>	<u>Average</u>	<u>Maximum</u>	<u>Minimum</u>
Area 1 BJY	3.92×10^{-13}	1.07×10^{-12}	-3.80×10^{-13}
Area 3 Mud Plant	3.48×10^{-13}	1.62×10^{-12}	-6.44×10^{-13}
Area 3 U-3ah/at N	1.10×10^{-13}	5.69×10^{-13}	-1.44×10^{-12}
Area 5 RWMS 1	1.72×10^{-12}	3.64×10^{-12}	4.87×10^{-13}
Area 5 RWMS 4	1.77×10^{-12}	3.74×10^{-12}	3.93×10^{-13}
Area 5 RWMS 6	1.37×10^{-12}	2.89×10^{-12}	-3.17×10^{-13}
Area 5 RWMS 8	2.40×10^{-11}	1.12×10^{-10}	1.77×10^{-13}
Area 10 SEDAN Crater	2.78×10^{-12}	6.35×10^{-12}	1.49×10^{-15}
Area 12 Camp	5.83×10^{-14}	9.46×10^{-13}	-5.59×10^{-13}
Area 12 E Tunnel Pond	2.86×10^{-12}	5.07×10^{-12}	-1.42×10^{-13}
Area 15 EPA Farm	5.18×10^{-12}	9.35×10^{-12}	1.91×10^{-12}
Area 23 H & S Building	8.31×10^{-14}	7.19×10^{-13}	-1.13×10^{-12}
All Sites	3.36×10^{-12}	2.40×10^{-11}	-8.31×10^{-14}

Table 1.6 Summary Data for Well and Surface Water Samples - First Quarter, CY 1997

GROUND WATER (μCi/mL)

<u>Well Name</u>	<u>Gross Alpha</u>	<u>Gross Beta</u>	<u>²³⁸Pu</u>	<u>²³⁹⁺²⁴⁰Pu</u>	<u>⁹⁰Sr</u>	<u>Enrich. Tritium</u>	<u>²²⁶Ra</u>	<u>²²⁸Ra</u>
Potable Wells								
Well 5B	5.5×10^{-09}	1.2×10^{-08}	-2.6×10^{-13}	8.5×10^{-11}	-3.3×10^{-11}	7.4×10^{-09}	-9.8×10^{-10}	2.7×10^{-10}
Well 5C	8.0×10^{-09}	5.9×10^{-09}	3.2×10^{-12}	-1.2×10^{-12}	-1.0×10^{-10}	7.1×10^{-09}	9.4×10^{-10}	3.7×10^{-10}
Well 4A	1.2×10^{-08}	8.2×10^{-09}	-1.2×10^{-12}	-3.6×10^{-12}	-1.3×10^{-10}	4.0×10^{-09}	-2.5×10^{-10}	3.8×10^{-10}
Well 4	1.0×10^{-08}	8.0×10^{-09}	-1.4×10^{-12}	-3.9×10^{-14}	-9.0×10^{-11}	6.8×10^{-09}	-7.9×10^{-10}	2.7×10^{-10}
Well C-1	8.0×10^{-09}	9.6×10^{-09}	-1.1×10^{-12}	-3.2×10^{-12}	-4.8×10^{-11}	8.5×10^{-09}	1.7×10^{-09}	8.8×10^{-10}
Well UE-16d	1.0×10^{-08}	8.7×10^{-09}	-1.4×10^{-12}	-3.8×10^{-14}	1.4×10^{-10}	7.0×10^{-09}	7.8×10^{-10}	5.7×10^{-11}
Well HTH 8	7.4×10^{-10}	2.7×10^{-09}	-2.1×10^{-12}	4.8×10^{-11}	-9.8×10^{-11}	3.8×10^{-09}	5.2×10^{-10}	-6.5×10^{-11}
Well Army #1	4.3×10^{-09}	6.3×10^{-09}	2.0×10^{-12}	1.5×10^{-11}	8.0×10^{-11}	7.5×10^{-09}	-5.6×10^{-10}	1.3×10^{-10}
Well J-12	1.3×10^{-09}	4.8×10^{-09}	4.7×10^{-13}	7.2×10^{-11}	-7.0×10^{-11}	6.5×10^{-09}	-9.8×10^{-10}	3.7×10^{-10}
Well J-13	2.1×10^{-09}	4.6×10^{-09}	-1.0×10^{-12}	-1.9×10^{-12}	5.1×10^{-11}	9.4×10^{-09}	4.8×10^{-10}	-2.5×10^{-10}

Industrial Wells

Well UE-5c	1.0×10^{-08}	6.7×10^{-09}	-9.8×10^{-13}	-2.7×10^{-14}	4.1×10^{-11}	6.2×10^{-09}	6.7×10^{-10}	6.8×10^{-11}
Network Avg.	6.5×10^{-09}	7.0×10^{-09}	-3.4×10^{-13}	1.9×10^{-11}	-2.4×10^{-11}	6.7×10^{-09}	1.4×10^{-10}	2.2×10^{-10}

SEWAGE LAGOONS (μCi/mL)

<u>Location</u>	<u>Gross Beta</u>	<u>²³⁸Pu</u>	<u>²³⁹Pu</u>	<u>Tritium</u>
Area 5 RWMS Sewage Pd	2.2×10^{-08}	-1.1×10^{-12}	9.9×10^{-12}	2.3×10^{-08}
Area 6 Yucca Sewage Pd	1.6×10^{-08}	-1.6×10^{-12}	2.7×10^{-11}	1.0×10^{-07}
Area 6 LANL Sewage Pd	2.9×10^{-08}	-1.2×10^{-12}	2.1×10^{-10}	1.4×10^{-07}
Area 6 DAF Sewage Pd	1.8×10^{-08}	-1.0×10^{-12}	-3.0×10^{-12}	-6.4×10^{-08}
Area 12 Sewage Pd	3.2×10^{-09}	-1.4×10^{-12}	-4.6×10^{-12}	-2.1×10^{-07}
Area 22 Sewage Pd	1.6×10^{-08}	-1.5×10^{-12}	4.3×10^{-11}	1.9×10^{-07}
Area 3 Sewage Pd	2.4×10^{-08}	-1.5×10^{-12}	7.0×10^{-11}	1.4×10^{-07}
Area 25 Central Support	2.6×10^{-08}	-1.8×10^{-12}	5.3×10^{-12}	1.1×10^{-07}
Average	1.9×10^{-08}	-1.4×10^{-12}	4.5×10^{-11}	1.7×10^{-07}

PONDS AND TUNNEL EFFLUENT (μCi/mL)

<u>Location</u>	<u>Gross Beta</u>	<u>Tritium</u>	<u>¹³⁷Cs</u>	<u>²³⁸Pu</u>	<u>²³⁹Pu</u>
E Tunnel Effluent	4.5×10^{-08}	1.1×10^{-3}	1.7×10^{-07}	4.0×10^{-10}	3.5×10^{-09}
E Tunnel Pond 2	8.3×10^{-08}	1.1×10^{-3}	1.5×10^{-07}	4.1×10^{-10}	3.2×10^{-09}
U-3cn PS#2 Pond	---	1.4×10^{-2}	---	---	---

Table 1.7 Potable Water Sample Summary Results ($\mu\text{Ci/mL}$) - First Quarter, CY 1997

<u>Location</u>	<u>Gross Alpha</u>	<u>Gross Beta</u>	<u>^{238}Pu</u>	<u>$^{239+240}\text{Pu}$</u>	<u>Tritium</u>
Area 1 Building 101	7.2×10^{-09}	6.5×10^{-09}	1.3×10^{-12}	-2.5×10^{-12}	1.8×10^{-08}
Area 2 Restroom	6.0×10^{-10}	2.9×10^{-09}	1.8×10^{-12}	-3.5×10^{-12}	2.4×10^{-07}
Area 6 Cafeteria	6.7×10^{-09}	6.7×10^{-09}	1.4×10^{-12}	-2.7×10^{-13}	3.0×10^{-08}
Area 6 Building 6-900	7.6×10^{-09}	5.2×10^{-09}	-1.1×10^{-12}	-2.9×10^{-12}	-1.3×10^{-07}
Area 12 Building 12-23	3.5×10^{-10}	3.2×10^{-09}	-1.1×10^{-12}	-2.7×10^{-12}	-7.9×10^{-08}
Area 23 Mercury	5.6×10^{-09}	7.4×10^{-09}	-1.4×10^{-12}	-3.5×10^{-12}	1.4×10^{-07}
Area 25 Building 4221	4.8×10^{-09}	9.2×10^{-09}	-1.2×10^{-12}	-3.0×10^{-13}	-2.4×10^{-08}
Average	4.7×10^{-09}	5.9×10^{-09}	-4.6×10^{-14}	-2.2×10^{-12}	2.8×10^{-08}

Table 1.8 Pond Water Depths in Infiltration Basins - First Quarter, CY 1997

<u>Impound</u>	<u>Maximum Operating Depth, cm</u>	<u>Average Depth, cm (First Quarter)</u>
Gate 100, Basin	90	40
Mercury, Basin	180	0
Yucca Lake		
North Basin	140	126
South Basin	140	0
Tweezer,		
East Basin	244	0
West Basin	244	0
CP-6		
East Basin	90	0
West Basin	90	0
CP-72	90	0
DAF		
Basin 1	150	0
Basin 2	150	0
Reactor Control, Basin	130	0
Test Stand 1, Basin	90	0
Test Cell C, Basin	90	0
Base Camp 25, Basin	100	0
Base Camp 12, Basin 1	120	0
Base Camp 12, Basin 2	120	0
Base Camp 12, Basin 3	120	0
Base Camp 12, Basin 4	120	0
Base Camp 12, Basin 5	120	0
RWMS-5, Basin 1	150	0
RWMS-5, Basin 2	150	0

Table 1.9 Influent Quality - First Quarter, CY 1997

<u>Facility</u>	<u>BOD₅^(a) (mg/L)</u>	<u>S.C.^(b) (μmhos/cm)</u>
Gate 100	257	2.70
Mercury	360	3.80
Yucca Lake	148	1.81
Tweezer	375	4.1
CP-6	0	0
CP-72	0	0
DAF	135	1.58
Reactor Control	0	0
Test Stand 1	0	0
Base Camp 25	192	1.65
Base Camp 12	6	0.28
Test Cell C	0	0
RWMS-5	66	1.35

(a) Biochemical Oxygen Demand

(b) Specific Conductivity

Table 1.10 Organic Loading Rates - First Quarter, CY 1997

<u>Facility</u>	<u>Limit (Kg/day)</u>	<u>Mean Daily Load Metered Rates</u>
Mercury	172	77.05
Yucca Lake	8.6	3.32
Base Camp 12	54	0.04
LANL on Tweezer	5.0	3.52
RWMS-5	0.955	.32
		<u>Calculated Rates</u>
CP-6	8.7	0 ^(a)
CP-72	1.1	0 ^(a)
DAF	7.6	0.67
Reactor Control	4.2	0
Eng Test Stand	2.3	0 ^(a)
Test Cell C	1.3	0 ^(a)
Base Camp 25	7.4	1.29
Gate 100	2.4	0.54

(a) Samples not taken due to inadequate or nonexistent flow

Table 1.11 Sample Results for Infiltration Basins that receive 30 cm or more of Liquid - First Quarter, CY 1997

<u>Parameter</u>	<u>Compliance Limit (mg/L)</u>	<u>Measurement (Mg/L)</u>
<u>AREA 6 YUCCA LAKE</u>		
Arsenic	0.5	(a)
Cadmium	0.1	(a)
Chromium	0.5	(a)
Lead	0.5	(a)
Selenium	0.1	(a)
Silver	0.5	(a)
Nitrate Nitrogen	100	(a)
Sulfate	5000	87.2
Chloride	1000	74.1
Fluoride	40	1.6
Tritium	(no limit)	(a)

(a) None Detected

Table 1.12 Quantity of Waste Disposed of in Landfills - First Quarter, CY 1997

<u>Month</u>	<u>Quantity (in pounds)</u>		
	<u>Area 9</u>	<u>Area 23</u>	<u>Area 6</u>
January	1,870,110	427,600	260,990
February	367,340	130,300	94,480
March	<u>217,520</u>	<u>190,000</u>	<u>12,400</u>
Total	2,454,970	747,900	367,870

Table 1.13 NEPA Documentation - First Quarter, CY 1997

<u>Number</u>	<u>Description</u>	<u>Category</u>	<u>File Review Status^(a)</u>
NV-93-025	Fire Training Facility, Area 23	EA	Canceled
NV-94-020	Pantex Sitewide EIS	EIS	01/17/97
NV-94-023	Transportation of BOMARC Missile Site Contaminated Material Area 5	EA	Canceled

(a) A date in this column is the date approved.

Table 1.13 (NEPA Documentation - First Quarter, CY 1997, cont.)

<u>Number</u>	<u>Description</u>	<u>File Review Category</u>	<u>Status^(a)</u>
NV-94-026	Liquid Waste Treatment Facility, Area 6	EA	01/14/97
NV-94-033	Storage and Disposition of Fissile Nuclear Materials, DOE	EIS	01/14/97
NV-95-032	Sitewide EIS for LANL, NTS/LANL	EIS	Pending
NV-95-062	RF Characterization Capability, Tweezer Facility, Area 11	CX	Pending
NV-95-066	Area 5 Low-Level Waste Management Site Improvement Project	EA	Pending
NV-96-002	Cotter Concentrate Treatment Facility, Area 5	EA	Withdrawn
NV-97-001	Johnson Atoll Soil Bench Scale Demonstration	CX	02/04/97
NV-97-002	Mining Training Center	CX	02/20/97
NV-97-003	Offsite Shipment of Cotter Concentrate	CX	02/20/97
NV-97-004	Recompletion of Well UE-5N	CX	02/27/97
NV-97-008	NTS Survey Control and Photo Marker Placement	CX	Pending
NV-97-010	Five Mobile Home Trailers at Pahute Mesa Airstrip	CX	03/04/97

(a) A date in this column is the date approved.

Table 1.14 Environmental Occurrences at NTS Facilities - First Quarter, CY 1997

<u>Date</u>	<u>Report Number</u>	<u>Description</u>	<u>Status</u>
01/22/97	NVOO-BNLV-NTS 1997-0002	Fuel Leak from August 1996 Reported when Site Remediated & Quantity Known	Pending

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M98050562

Report Number (14) DOE/NV/11718--152

Publ. Date (11) 199710

Sponsor Code (18) DOE/EH, XF

UC Category (19) UC-600, DOE/ER

DOE