LEHR
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June 12, 1996

Battelle
Pacific Northwest Laboratories
University of California, Davis
M.S. ITEH-Battelle
Old Davis Road
Davis, CA 95616
Telephone (916) 752-7777

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Mr. Steve Lasell
U.S. Department of Energy
Oakland Operations Office
1301 Clay Street, Rm 700N
Oakland, CA 94612-5208

SUBJECT: LEHR's Energy Radionuclide Air Emissions Annual Report

Dear Steve:

Enclosed please find the final Air Emissions Annual Report for LEHR 1995. All comments have been incorporated into the report. Please obtain Jim Littlejohn's signature on the Certification Page.

If you should have any questions, please call me at (916) 752-4023.

Sincerely,

Dawn Mitchell,
Project Manager

enclosure

cc: Salem Attiga, LEHR
Jim Littlejohn, DOE/OAK
Lois Marik, DOE/OAK
Larry McEwen, DOE/OAK
Joe Wong, DOE/OAK

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U.S. Department of Energy
Radionuclide Air Emissions Annual Report
(under Subpart H of 40 CFR Part 61)
Calendar Year 1995

Site Name: Laboratory for Energy-Related Health Research

Field Office Information

office: Oakland Operations Office

Address: 1301 Clay Street; Room 700N
Oakland, California 94612-5208

Contact:	Steve Lasell	Phone: (510) 637-1602
Alternate:	Lois Marik	Phone: (510) 637-1604

Site Information

Operator: Pacific Northwest Laboratory

Address: ITEH/Battelle
Old Davis Road
Davis, California 95616

Contact:	Dawn Mitchell	Phone: (916) 752-4023
Alternate:	Salem Attiga	Phone: (916) 752-5459

Section I. Facility Information

The laboratory for Energy-Related Health Research (LEHR) site is in compliance with Subpart H of 40 CFR Part 61 for Radionuclide air emissions. The activities on the LEHR site that could generate Radionuclide emissions during 1995 were the decontamination and decommissioning (D&D) of the Imhoff and Cobalt-60 Buildings.

Site Description

LEHR was primarily a research institution, which is now in the process of D&D and environmental restoration. The environmental restoration is being managed by Pacific Northwest National Laboratory (PNNL) for the U.S. Department of Energy (DOE) Oakland Operations Office (OAK). The LEHR site occupies approximately 15 acres. LEHR has occupied the current site for 34 years, and was operated for the DOE by the University of California at Davis (UC Davis). During LEHR's operation, studies were conducted on the long-term biological effects of low-level radiation exposure on laboratory animals. The research primarily used the bone-seeking radionuclides strontium-90 and radium-226 on beagle dogs.

LEHR is located approximately 1 mile south of the main UC Davis campus in Davis, California. Davis is situated approximately 13 miles west of Sacramento, California.

The Sacramento valley, where Davis is located, has a mild (Mediterranean) climate and abundance of sunshine most of the year. Cloudless skies prevail during the summer, and for much of the spring and autumn. In the rainy season from November through March, over three-fourths of the total annual precipitation falls, yet rain in measurable amounts occurs only about nine days per month during this period. This year rainfall has been above normal. The mean temperature is 61.3 degrees Fahrenheit. Prevailing winds at Davis are southerly every month except November, when they are northerly.

LEHR is surrounded on all sides by UC Davis property. Prime California agricultural land surrounds UC Davis. The nearest dairy or meat producing farm is at least 500 meters from the LEHR site. Privately owned farms are within 1-2 miles of the LEHR site.

Source Description

Types of Activities: LEHR Environmental Restoration Project

The emission sources for the calendar year 1995 were the D&D operations in the Imhoff and Cobalt-60 Buildings.

International Technology, Inc., was subcontracted by PNNL to D&D the contaminated portions of these facilities on the LEHR site. D&D operations in the Imhoff building commenced in 1994 and were completed in 1995. The primary radionuclides, present as

residual contamination, were strontium-90 and radium-226. Trace amounts of other radioactive materials, such as plutonium-241, were measured during past sampling of the facility. D&D operations included demolition of the structure. Emissions to the environment from the Imhoff Building D&D were through three short roof exhaust stacks from the containment tent's HEPA filtered ventilation system. A totally enclosed radiological containment structure was constructed around the Imhoff Building prior to the start of D&D.

D&D operations in the Cobalt-60 Building were conducted in 1995. The primary radionuclides, present in stored radioactive materials, were strontium-90, radium-226 and thorium-228. D&D operations included decontamination and survey of the structure. Emissions to the environment from the Cobalt-60 Building D&D exited a short roof exhaust stack through a HEPA filtered ventilation system.

There are several soil (nonpoint source) areas with known or potential radioactive contamination resultant from past activities at the LEHR site. These are the Strontium-90 Leach Field, the Radium-226 Seepage System, Southwest Chemical Dispensing Area, North Chemical Dispensing Area, Dog Pen Areas, inactive landfill units, stormwater runoff system, and radioactive waste burial trenches.

The Strontium-90 Leach Field consists of two leach fields used to disperse low-level contaminated liquid effluent from an Imhoff treatment process. The soils above the leach fields are partially covered by pavement and site structures. The primary radioisotope present in the effluent was strontium-90. This area is currently under investigation as part of the site Remedial Investigation and Feasibility Study.

The Radium-226 Seepage Systems consisted of four septic tanks, three seepage pits and a leach line. The system was used to dispose of the excrement from dogs that were part of the radium-226 injection studies. Part of the Radium-226 Seepage System is located beneath a paved area. This area is currently under investigation as part of the site Remedial Investigation and Feasibility Study.

The North Chemical Dispensing Area and Southwest Chemical Dispensing Area were used to disburse bulk chemicals. Site characterization has detected near-background concentrations of radioactive materials in the soil of the Southwest Chemical Dispensing Area. No residual radioactive material contamination has been measured in the near-surface soils of the North Chemical Dispensing Area. These areas are currently under investigation as part of the site Remedial Investigation and Feasibility Study.

There are two Dog Pen Areas on-site that consist of several fenced dog runs with shelters. The dog pen areas were used to house the dogs that participated in the strontium-90 and radium-226 studies. While the feces was removed from the pens on a regular basis, radioactive contamination may have been deposited in the area by way of urine. Patches of low-level radioactive contamination has been detected in the sub-surface soils of the Dog Pen

Areas. These areas are currently under investigation as part of the site Remedial Investigation and Feasibility Study.

There are two inactive UC Davis landfill units located on-site. Past segregation practices indicate that no radioactive materials were disposed of in this area. The areas are currently under investigation as part of the site Remedial Investigation and Feasibility Study.

Water runoff from the site is collected by a stormwater system which discharges to a ditch with the eventual outfall into the nearby Putah Creek. Radioactive contamination has not been detected in the sediments from this system.

The trenches used to bury radioactive waste on-site were located approximately 8 to 10 feet below ground surface. Uncontaminated soil was sued as backfill for these trenches. Records of the disposed waste show that radionuclides include, but are not limited to, carbon-14, calcium-45, cesium-137, chlorine-36, chromium-51, cobalt-57, cobalt-60, gallium-67, gold-198, hydrogen-3, indium-111, iodine-125, iodine-131, iron-59, mercury-203, molybdenum-99, phosphorus-32, radium-226, rubidium-86, selenium-75, sodium-22, strontium-85, strontium-90, sulfur-35, uranium-238, and zinc-65. Residual radioactive material contamination has not been measured in the near-surface (cap) soils above the radioactive waste burial trenches. These areas are currently under investigation as part of the site Remedial Investigation and Feasibility Study.

Of the above areas, only four have been determined to have radioactive material contamination in near-surface soils that could potentially lead to airborne radioactive material emissions. They are the Radium-226 Seepage System, Strontium-90 Leach Fields, Southwest Chemical Dispensing Area, and the Dog Pen Areas.

Section II. Air Emissions Data

Point Source	Type Control	Efficiency	Distance to Nearest Receptor
Imhoff Exhaust Stack 1*	HEPA	99.9%	25 meters
Imhoff Exhaust Stack 2*	HEPA	99.9%	25 meters
Imhoff Exhaust Stack 3*	HEPA	99.9%	25 meters
Cobalt-60 Exhaust Stack*	HEPA	99.9%	15 meters

Grouped Source	Type Control	Efficiency	Distance to Nearest Receptor
None			

Point Source Radionuclide	Annual Quantity (Ci)§
Radium-226	1.7×10^{-7}
Strontium-90	6.6×10^{-7}
Yttrium-90	6.6×10^{-7}
Americium-241	1.0×10^{-10}
Plutonium-239	1.0×10^{-10}
Neptunium-237	1.0×10^{-10}
Hydrogen-3	1.0×10^{-9}

Nonpoint Source

Radium-226 Seepage System
Strontium-90 Leach Fields
Southwest Chemical Dispensing Area
Dog Pen Areas

Nonpoint Source Radionuclide	Annual Quantity (Ci)¶	
Hydrogen-3	6.7×10^{-4}	[2.5×10^{7} Bq]
Strontium-90	2.8×10^{-4}	[1.0×10^{7} Bq]

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* Point source emission not requiring continuous monitoring
§ Estimated maximum possible release from modelling assumptions
¶ Quantity based upon 0.001 m erosion of surface soil per year from a contaminated area.

Section III. Dose Assessments

Description of Dose Model

Compliance with the NESHAP requirements for point source emissions is assessed using the EPA-approved CAP-88PC computer code. Because portions of the LEHR facility have been returned to the University of California, Davis, for use in campus research programs, the potential Maximally Exposed Individual locations include nonLEHR university research staff located on the LEHR site.

The DOE computer code RESRAD was used to show compliance with the effective dose equivalent standard for nonpoint source emissions. The radon and groundwater contamination pathways of the RESRAD code were suppressed for computation regarding NESHAP compliance.

Summary of Input Parameters

The input parameters for the NESHAP calculations for the point source emissions are shown on the attached CAP-88PC reports. For source data, it was assumed that 10 percent of the total potential residual contamination was released through a 95% efficient filter. This is a very conservative estimate as both environmental air monitoring and noncontinuous air monitoring at the release points have not detected any Radionuclide emissions above natural background levels. The Sacramento area wind file contained in the CAP-88PC computer code was used for the modeling, because of the site's close proximity (approximately 15 miles) to Sacramento, similar geography, and the absence of intervening geographical anomalies. Population data for Davis, Ca. and the UC Davis Campus were used for determination of the colloective dose equivalent for 1995 releases.

The input parameters for the nonpoint source emissions computer model are attached as excerpts from the RESRAD program reports. The size of the contaminated area, thickness of contaminated zone, and depth of uncontaminated cover were estimated from existing site characterization data. Sensitivity analyses were performed on these parameters where exact existing site characterization data and, where characterization data did not reveal all expected residual contaminants, estimated residual contaminants and their specific activities. The output of the RESRAD computer code provides a summary of the exposure to a person living on the site.

Compliance Assessment

Point Source Effective Dose Equivalent: 8.67×10^{-4} (mrem)

Note: Contributions to the effective dose equivalent from nonpoint source emissions were insignificant.

Location of Maximally Exposed Individual: UC Davis ITEH facility (15 Meters North)

Certification

I certify under penalty of law that I have personally examined and an familiar with the information submitted herein and based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment. (See, 18 U.S.C. 1001).

Name: Dawn Mitchell, PNL Project Manager

Signature: _____ Date: 6/12/96

Name: Jim Littlejohn, DOE-OAK Project Manager

Signature: _____ Date: _____

Section IV. Additional Information

- **For facilities that have completed construction or modification projects during the 1995 calendar year for which no application for approval to construct or modify was required to be submitted to EPA, provide a brief description of the construction or modification project and an estimate of potential doses to the public.**

  There were no construction or modification projects completed within 1995 calendar year at the facility for which approval to construct or modify was waived under Section 61.69 of Subpart H of 40 CFR Part 61. Construction and modification projects conducted at the LEHR Site for calendar year 1995 consisted of the demolition of the Imhoff building and the decontamination/survey of the Cobalt-60 building. Potential doses to the public from these activities have been included in this report as point source emissions.

- **Identify any unplanned releases of radionuclides to the atmosphere.**

  There were no unplanned releases of radionuclides to the atmosphere during 1995.

- **Results of the dose assessment associated with the diffuse source emissions from the facility.**

  The RESRAD computer code was sued to calculate doses from the Strontium-90 Leach Field, the Radium-226 Seepage System, the Southwest Chemical Dispensing Area and the Dog Pen Areas. The results of this dose assessment estimate a dose Equivalent of $1.47.x\ 10^{-5}$ mrem/y from the Strontium-90 Leach Field, 1.74×10^{-5} mrem/y form the Southwest Chemical Dispensing Area, and 1.29×10^{-6} mrem/y from the Radium-226 Seepage System. A dose of 0.00 mrem/y was calculated for the Dog Pen Areas. A total contribution to the effective dose equivalent from nonpoint source emissions was calculated to be 3.3×10^{-5} mrem.

A combined nonpoint and point source effective dose equivalent to the Maximally Exposed Individual would be 9.00×10^{-4} mrem.

Attachment 2

DOE SUPPLEMENTAL INFORMATION

- **Provide an estimate of collective dose equivalent for 1995 releases.**

  The collective population dose for calendar year 1995 emissions to the population within an 80 km. distance of the facility is estimated to be 4.88×10^{-6} person-rem.

- **Provide information on the status of compliance with Subparts Q and T of 40 CFR Part 61.**

  LEHR is in compliance with Subparts Q and T of 40 CFR Part 61. This is based on a radon study conducted at the LEHR facility by DOE.

- **Provide information on radon-220 emissions from sources containing uranium-232 and thorium-232 where emissions potentially can exceed 0.1 mrem/yr to the public or 10% of the nonradon dose to the public.**

  There are no unencapsulated uranium-232 or thorium-232 sources stored at the facility. The emissions from radon-220 from encapsulated sources would not result in a dose to a member of the public in excess of 0.1 mrem/yr or exceed 10% of the nonradon dose to the public from the site.

- **Provide information on radon-222 emissions from nondisposal/nonstorage sources where emissions potentially can exceed 0.1 mrem/yr to the public or 10% of the nonradon dose to the public.**

  There are no nondisposal or nonstorage sources of radon-222 located at the facility.

- **Give the number of emission points subject to the continuous monitoring requirements of Section 61.93(b) of 40 CFR, the number of these emission points that do not comply with Section 61.93(b) requirements, and the cost of upgrades. Describe site periodic confirmatory measurement plans. Indicate the status of the QA program described by Appendix B, Method 114.**

  There are no point source emissions that require continuous monitoring according to Subpart H of 40 CFR.

  The LEHR facility Environmental Monitoring Plan requires air sampling be conducted either at the release stack or release location from the Imhoff and Cobalt-60 Buildings. This periodic sampling fills the requirements of NESHAPS periodic confirmatory sampling. Air samples were taken downstream of the HEPA filters during the period when the HEPA-filtered ventilation systems were in operation. The air sample were collected using isokinetic sampling techniques. The air samples were drawn from the stack near the discharge point to the environment. Air sample filters

were removed from the sample apparatus weekly and evaluated for radioisotopic content.

Because there are no point source emissions that require continuous monitoring, QA programs for the LEHR Environmental Monitoring Program are done in accordance with DOE guidance in DOE Order 5700.6C and DOE Order 5400.1.

IMHOFF CAP-88

C A P 8 8 - P C

Version 1.00

Clean Air Act Assessment Package - 1988

S Y N O P S I S R E P O R T

Non-Radon Individual Assessment
May 1, 1996 2:04 pm

Facility: IMHOFF Building
Address: UC Davis
City: Davis
State: CA Zip:

Effective Dose Equivalent (mrem/year)
8.67E-04

At This Location: 25 Meters North Northeast
Source Category: elevated release with filtration
Source Type: Stack
Emission Year: 95

Comments: Estimated dose from IMHOFF building CY 95. Source adjusted for DF 1000 and 1/3 of CY 94 inventory.

Dataset Name: ucdimhoff95
Dataset Date: May 1, 1996 1:35 pm
Wind File: WNDFILES\SAC0320.WND

MAXIMALLY EXPOSED INDIVIDUAL

Location Of The Individual: 25 Meters North Northeast
Lifetime Fatal Cancer Risk: 1.31E-08

ORGAN DOSE EQUIVALENT SUMMARY

Organ	Dose Equivalent (mrem/y)
GONADS	9.93E-05
BREAST	9.96E-05
R MAR	2.29E-03
LUNGS	1.80E-03
THYROID	9.89E-05
ENDOST	9.53E-03
RMNDR	1.59E-04
EFFEC	8.67E-04

RADIONUCLIDE EMISSIONS DURING THE YEAR 95

Nuclide	Class	Size	Source #1 Ci/y	TOTAL Ci/y
SR-90	D	1.00	6.6E-07	6.6E-07
Y-90	Y	1.00	6.6E-07	6.6E-07
RA-226	W	1.00	1.7E-07	1.7E-07

SITE INFORMATION

Temperature:	20 degrees C
Precipitation:	45 cm/y
Mixing Height:	1000 m

SOURCE INFORMATION

Source Number:	1
Stack Height (m):	1.00
Diameter (m):	0.31
Plume Rise Momentum (m/s): (Exit Velocity)	1.16E+01

AGRICULTURAL DATA

	Vegetable	Milk	Meat
Fraction Home Produced:	0.700	0.399	0.442
Fraction From Assessment Area:	0.300	0.601	0.558
Fraction Imported:	0.000	0.000	0.000

Food Arrays were not generated for this run.
Default Values used.

DISTANCES USED FOR MAXIMUM INDIVIDUAL ASSESSMENT

25

C A P 8 8 - P C

Version 1.00

Clean Air Act Assessment Package - 1988

G E N E R A L D A T A

Non-Radon Individual Assessment
May 1, 1996 2:04 pm

Facility: IMHOFF Building
Address: UC Davis
City: Davis
State: CA Zip:

Source Category: elevated release with filtration
Source Type: Stack
Emission Year: 95

Comments: Estimated dose from IMHOFF building CY 95. Source adjusted for DF 1000 and 1/3 of CY 94 inventory.

Dataset Name: ucdimhoff95
Dataset Date: May 1, 1996 1:35 pm
Wind File: WNDFILES\SAC0320.WND

VALUES FOR RADIONUCLIDE-DEPENDENT PARAMETERS

Nuclide	Clearance Class	Particle Size (microns)	Scavenging Coefficient (per second)	Dry Deposition Velocity (m/s)
SR-90	D	1.0	4.50E-06	1.80E-03
Y-90	Y	1.0	4.50E-06	1.80E-03
RA-226	W	1.0	4.50E-06	1.80E-03

VALUES FOR RADIONUCLIDE-DEPENDENT PARAMETERS

	DECAY CONSTANT (PER DAY)			TRANSFER COEFFICIENT	
Nuclide	Radio-active (1)	Surface	Water	Milk (2)	Meat (3)
SR-90	0.00E+00	5.48E-05	0.00E+00	1.50E-03	3.00E-04
Y-90	2.60E-01	5.48E-05	0.00E+00	2.00E-05	3.00E-04
RA-226	0.00E+00	5.48E-05	0.00E+00	4.50E-04	2.50E-04

FOOTNOTES:
(1) Effective radioactive decay constant in plume; set to zero if less than 1.0E-2

(2) Fraction of animal's daily intake of nuclide which appears in each L of milk (days/L)

(3) Fraction of animal's daily intake of nuclide which appears in each kg of meat (days/kg)

VALUES FOR RADIONUCLIDE-DEPENDENT PARAMETERS

Nuclide	CONCENTRATION UPTAKE FACTOR		GI UPTAKE FRACTION	
	Forage (1)	Edible (2)	Inhalation	Ingestion
SR-90	2.50E+00	1.07E-01	3.00E-01	3.00E-01
Y-90	1.50E-02	2.57E-03	1.00E-04	1.00E-04
RA-226	1.50E-02	6.42E-04	2.00E-01	2.00E-01

FOOTNOTES: (1) Concentration factor for uptake of nuclide from soil for pasture and forage (in pCi/kg dry weight per pCi/kg dry soil)

(2) Concentration factor for uptake of nuclide from soil by edible parts of crops (in pCi/kg wet weight per pCi/kg dry soil)

VALUES FOR RADIONUCLIDE-INDEPENDENT PARAMETERS

HUMAN INHALATION RATE	
Cubic centimeters/hr	9.17E+05
SOIL PARAMETERS	
Effective surface density (kg/sq m, dry weight) (Assumes 15 cm plow layer)	2.15E+02
BUILDUP TIMES	
For activity in soil (years)	1.00E+02
For radionuclides deposited on ground/water (days)	3.65E+04
DELAY TIMES	
Ingestion of pasture grass by animals (hr)	0.00E+00
Ingestion of stored feed by animals (hr)	2.16E+03
Ingestion of leafy vegetables by man (hr)	3.36E+02
Ingestion of produce by man (hr)	3.36E+02
Transport time from animal feed-milk-man (day)	2.00E+00
Time from slaughter to consumption (day)	2.00E+01
WEATHERING	
Removal rate constant for physical loss (per hr)	2.90E-03
CROP EXPOSURE DURATION	
Pasture grass (hr)	7.20E+02
Crops/leafy vegetables (hr)	1.44E+03
AGRICULTURAL PRODUCTIVITY	
Grass-cow-milk-man pathway (kg/sq m)	2.80E-01
Produce/leafy veg for human consumption (kg/sq m)	7.16E-01
FALLOUT INTERCEPTION FRACTIONS	
Vegetables	2.00E-01
Pasture	5.70E-01
GRAZING PARAMETERS	
Fraction of year animals graze on pasture	4.00E-01
Fraction of daily feed that is pasture grass when animal grazes on pasture	4.30E-01

VALUES FOR RADIONUCLIDE-INDEPENDENT PARAMETERS

ANIMAL FEED CONSUMPTION FACTORS	
Contaminated feed/forage (kg/day, dry weight)	1.56E+01
DAIRY PRODUCTIVITY	
Milk production of cow (L/day)	1.10E+01
MEAT ANIMAL SLAUGHTER PARAMETERS	
Muscle mass of animal at slaughter (kg)	2.00E+02
Fraction of herd slaughtered (per day)	3.81E-03
DECONTAMINATION	
Fraction of radioactivity retained after washing for leafy vegetables and produce	5.00E-01
FRACTIONS GROWN IN GARDEN OF INTEREST	
Produce ingested	1.00E+00
Leafy vegetables ingested	1.00E+00
INGESTION RATIOS:	
IMMEDIATE SURROUNDING AREA/TOTAL WITHIN AREA	
Vegetables	7.00E-01
Meat	4.42E-01
Milk	3.99E-01
MINIMUM INGESTION FRACTIONS FROM OUTSIDE AREA	
(Minimum fractions of food types from outside area listed below are actual fixed values.)	
Vegetables	0.00E+00
Meat	0.00E+00
Milk	0.00E+00
HUMAN FOOD UTILIZATION FACTORS	
Produce ingestion (kg/y)	1.76E+02
Milk ingestion (L/y)	1.12E+02
Meat ingestion (kg/y)	8.50E+01
Leafy vegetable ingestion (kg/y)	1.80E+01
SWIMMING PARAMETERS	
Fraction of time spent swimming	0.00E+00
Dilution factor for water (cm)	1.00E+00

Co-60 CAP-88

C A P 8 8 - P C

Version 1.00

Clean Air Act Assessment Package - 1988

S Y N O P S I S R E P O R T

Non-Radon Individual Assessment
Apr 26, 1996 2:19 pm

Facility: Co-60 Building
Address: UC Davis
City: Davis
State: CA Zip:

Effective Dose Equivalent (mrem/year)
1.14E-07

At This Location: 15 Meters East
Source Category: elevated release with filtration
Source Type: Stack
Emission Year: 95

Comments: Estimated dose from future D&D of Co-60 building

Dataset Name: ucdavisfil
Dataset Date: Apr 26, 1996 2:18 pm
Wind File: WNDFILES\SAC0320.WND

MAXIMALLY EXPOSED INDIVIDUAL

Location Of The Individual: 15 Meters East
Lifetime Fatal Cancer Risk: 6.61E-13

ORGAN DOSE EQUIVALENT SUMMARY

Organ	Dose Equivalent (mrem/y)
GONADS	2.37E-08
BREAST	3.45E-09
R MAR	1.53E-07
LUNGS	8.69E-08
THYROID	3.26E-09
ENDOST	1.84E-06
RMNDR	7.97E-08
EFFEC	1.14E-07

Location of the individual 15 meters east

RADIONUCLIDE EMISSIONS DURING THE YEAR 95

Nuclide	Class	Size	Source #1 Ci/y	TOTAL Ci/y
AM-241	W	1.00	1.0E-10	1.0E-10
H-3	*	0.00	1.0E-09	1.0E-09
NP-237	W	1.00	1.0E-10	1.0E-10
PU-239	Y	1.00	1.0E-10	1.0E-10
SR-90	D	1.00	1.0E-10	1.0E-10
Y-90	Y	1.00	1.0E-10	1.0E-10
RA-226	W	1.00	1.0E-10	1.0E-10

SITE INFORMATION

Temperature:	20 degrees C
Precipitation:	45 cm/y
Mixing Height:	1000 m

SOURCE INFORMATION

Source Number:	1
Stack Height (m):	5.40
Diameter (m):	0.31
Plume Rise Momentum (m/s): (Exit Velocity)	9.65E+00

AGRICULTURAL DATA

	Vegetable	Milk	Meat
Fraction Home Produced:	0.700	0.399	0.442
Fraction From Assessment Area:	0.300	0.601	0.558
Fraction Imported:	0.000	0.000	0.000

Food Arrays were not generated for this run.
Default Values used.

DISTANCES USED FOR MAXIMUM INDIVIDUAL ASSESSMENT

15

C A P 8 8 - P C

Version 1.00

Clean Air Act Assessment Package - 1988

G E N E R A L D A T A

Non-Radon Individual Assessment
Apr 26, 1996 2:19 pm

Facility: Co-60 Building
Address: UC Davis
City: Davis
State: CA Zip:

Source Category: elevated release with filtration
Source Type: Stack
Emission Year: 95

Comments: Estimated dose from future D&D of Co-60 building

Dataset Name: ucdavisfil
Dataset Date: Apr 26, 1996 2:18 pm
Wind File: WNDFILES\SAC0320.WND

VALUES FOR RADIONUCLIDE-DEPENDENT PARAMETERS

Nuclide	Clearance Class	Particle Size (microns)	Scavenging Coefficient (per second)	Dry Deposition Velocity (m/s)
AM-241	W	1.0	4.50E-06	1.80E-03
H-3	*	0.0	0.00E+00	0.00E+00
NP-237	W	1.0	4.50E-06	1.80E-03
PU-239	Y	1.0	4.50E-06	1.80E-03
SR-90	D	1.0	4.50E-06	1.80E-03
Y-90	Y	1.0	4.50E-06	1.80E-03
RA-226	W	1.0	4.50E-06	1.80E-03

VALUES FOR RADIONUCLIDE-DEPENDENT PARAMETERS

Nuclide	DECAY CONSTANT (PER DAY)			TRANSFER COEFFICIENT	
	Radio-active (1)	Surface	Water	Milk (2)	Meat (3)
AM-241	0.00E+00	5.48E-05	0.00E+00	4.00E-07	3.50E-06
H-3	0.00E+00	5.48E-05	0.00E+00	0.00E+00	0.00E+00
NP-237	0.00E+00	5.48E-05	0.00E+00	5.00E-06	5.50E-05
PU-239	0.00E+00	5.48E-05	0.00E+00	1.00E-07	5.00E-07
SR-90	0.00E+00	5.48E-05	0.00E+00	1.50E-03	3.00E-04
Y-90	2.60E-01	5.48E-05	0.00E+00	2.00E-05	3.00E-04
RA-226	0.00E+00	5.48E-05	0.00E+00	4.50E-04	2.50E-04

FOOTNOTES:
(1) Effective radioactive decay constant in plume; set to zero if less than 1.0E-2

(2) Fraction of animal's daily intake of nuclide which appears in each L of milk (days/L)

(3) Fraction of animal's daily intake of nuclide which appears in each kg of meat (days/kg)

VALUES FOR RADIONUCLIDE-DEPENDENT PARAMETERS

	CONCENTRATION UPTAKE FACTOR		GI UPTAKE FRACTION	
Nuclide	Forage (1)	Edible (2)	Inhalation	Ingestion
AM-241	5.50E-03	1.07E-04	1.00E-03	1.00E-03
H-3	0.00E+00	0.00E+00	9.50E-01	9.50E-01
NP-237	1.00E-01	4.28E-03	1.00E-03	1.00E-03
PU-239	4.50E-04	1.93E-05	1.00E-04	1.00E-03
SR-90	2.50E+00	1.07E-01	3.00E-01	3.00E-01
Y-90	1.50E-02	2.57E-03	1.00E-04	1.00E-04
RA-226	1.50E-02	6.42E-04	2.00E-01	2.00E-01

FOOTNOTES: (1) Concentration factor for uptake of nuclide from soil for pasture and forage (in pCi/kg dry weight per pCi/kg dry soil)

(2) Concentration factor for uptake of nuclide from soil by edible parts of crops (in pCi/kg wet weight per pCi/kg dry soil)

H-3 DOSE CONVERSION FACTOR FOR WATER INGESTION (rem-cc/pCi-y): 5.70E-02

VALUES FOR RADIONUCLIDE-INDEPENDENT PARAMETERS

HUMAN INHALATION RATE	
Cubic centimeters/hr	9.17E+05
SOIL PARAMETERS	
Effective surface density (kg/sq m, dry weight) (Assumes 15 cm plow layer)	2.15E+02
BUILDUP TIMES	
For activity in soil (years)	1.00E+02
For radionuclides deposited on ground/water (days)	3.65E+04
DELAY TIMES	
Ingestion of pasture grass by animals (hr)	0.00E+00
Ingestion of stored feed by animals (hr)	2.16E+03
Ingestion of leafy vegetables by man (hr)	3.36E+02
Ingestion of produce by man (hr)	3.36E+02
Transport time from animal feed-milk-man (day)	2.00E+00
Time from slaughter to consumption (day)	2.00E+01
WEATHERING	
Removal rate constant for physical loss (per hr)	2.90E-03
CROP EXPOSURE DURATION	
Pasture grass (hr)	7.20E+02
Crops/leafy vegetables (hr)	1.44E+03
AGRICULTURAL PRODUCTIVITY	
Grass-cow-milk-man pathway (kg/sq m)	2.80E-01
Produce/leafy veg for human consumption (kg/sq m)	7.16E-01
FALLOUT INTERCEPTION FRACTIONS	
Vegetables	2.00E-01
Pasture	5.70E-01
GRAZING PARAMETERS	
Fraction of year animals graze on pasture	4.00E-01
Fraction of daily feed that is pasture grass when animal grazes on pasture	4.30E-01

VALUES FOR RADIONUCLIDE-INDEPENDENT PARAMETERS

ANIMAL FEED CONSUMPTION FACTORS	
Contaminated feed/forage (kg/day, dry weight)	1.56E+01
DAIRY PRODUCTIVITY	
Milk production of cow (L/day)	1.10E+01
MEAT ANIMAL SLAUGHTER PARAMETERS	
Muscle mass of animal at slaughter (kg)	2.00E+02
Fraction of herd slaughtered (per day)	3.81E-03
DECONTAMINATION	
Fraction of radioactivity retained after washing for leafy vegetables and produce	5.00E-01
FRACTIONS GROWN IN GARDEN OF INTEREST	
Produce ingested	1.00E+00
Leafy vegetables ingested	1.00E+00
INGESTION RATIOS:	
IMMEDIATE SURROUNDING AREA/TOTAL WITHIN AREA	
Vegetables	7.00E-01
Meat	4.42E-01
Milk	3.99E-01
MINIMUM INGESTION FRACTIONS FROM OUTSIDE AREA (Minimum fractions of food types from outside area listed below are actual fixed values.)	
Vegetables	0.00E+00
Meat	0.00E+00
Milk	0.00E+00
HUMAN FOOD UTILIZATION FACTORS	
Produce ingestion (kg/y)	1.76E+02
Milk ingestion (L/y)	1.12E+02
Meat ingestion (kg/y)	8.50E+01
Leafy vegetable ingestion (kg/y)	1.80E+01
SWIMMING PARAMETERS	
Fraction of time spent swimming	0.00E+00
Dilution factor for water (cm)	1.00E+00

RESRAD FOR DIFFUSE SOURCES

Dose Conversion Factor (and Related) Parameter Summary

0 Menu	Parameter	Current Value	Default	Parameter Name
A-1	Ground external gamma, volume DCF's, (mrem/yr)/(pCi/cm**3):			
A-1	Cs-137+D, soil density = 1.0 g/cm**3	5.030E+00	5.030E+00	DCF1(1,1)
A-1	Cs-137+D, soil density = 1.8 g/cm**3	2.770E+00	2.770E+00	DCF1(1,2)
A-1				
A-1	Pb-210+D, soil density = 1.0 g/cm**3	4.870E-03	4.870E-03	DCF1(2,1)
A-1	Pb-210+D, soil density = 1.8 g/cm**3	2.310E-03	2.310E-03	DCF1(2,2)
A-1				
A-1	Ra-226+D, soil density = 1.0 g/cm**3	1.550E+01	1.550E+01	DCF1(3,1)
A-1	Ra-226+D, soil density = 1.8 g/cm**3	8.560E+00	8.560E+00	DCF1(3,2)
A-1				
A-1	Sr-90+D , soil density = 1.0 g/cm**3	0.000E+00	0.000E+00	DCF1(4,1)
A-1	Sr-90+D , soil density = 1.8 g/cm**3	0.000E+00	0.000E+00	DCF1(4,2)
A-3	Depth factors, ground external gamma, dimensionless:			
A-3	Cs-137+D, soil density = 1.0 g/cm**3, thickness = .15 m	7.200E-01	7.200E-01	FD(1,1,1)
A-3	Cs-137+D, soil density = 1.0 g/cm**3, thickness = 0.5 m	9.800E-01	9.800E-01	FD(1,2,1)
A-3	Cs-137+D, soil density = 1.0 g/cm**3, thickness = 1.0 m	1.000E+00	1.000E+00	FD(1,3,1)
A-3	Cs-137+D, soil density = 1.8 g/cm**3, thickness = .15 m	9.100E-01	9.100E-01	FD(1,1,2)
A-3	Cs-137+D, soil density = 1.8 g/cm**3, thickness = 0.5 m	1.000E+00	1.000E+00	FD(1,2,2)
A-3	Cs-137+D, soil density = 1.8 g/cm**3, thickness = 1.0 m	1.000E+00	1.000E+00	FD(1,3,2)
A-3				
A-3	Pb-210+D, soil density = 1.0 g/cm**3, thickness = .15 m	8.800E-01	8.800E-01	FD(2,1,1)
A-3	Pb-210+D, soil density = 1.0 g/cm**3, thickness = 0.5 m	1.000E+00	1.000E+00	FD(2,2,1)
A-3	Pb-210+D, soil density = 1.0 g/cm**3, thickness = 1.0 m	1.000E+00	1.000E+00	FD(2,3,1)
A-3	Pb-210+D, soil density = 1.8 g/cm**3, thickness = .15 m	9.700E-01	9.700E-01	FD(2,1,2)
A-3	Pb-210+D, soil density = 1.8 g/cm**3, thickness = 0.5 m	1.000E+00	1.000E+00	FD(2,2,2)
A-3	Pb-210+D, soil density = 1.8 g/cm**3, thickness = 1.0 m	1.000E+00	1.000E+00	FD(2,3,2)
A-3				
A-3	Ra-226+D, soil density = 1.0 g/cm**3, thickness = .15 m	6.300E-01	6.300E-01	FD(3,1,1)
A-3	Ra-226+D, soil density = 1.0 g/cm**3, thickness = 0.5 m	9.200E-01	9.200E-01	FD(3,2,1)
A-3	Ra-226+D, soil density = 1.0 g/cm**3, thickness = 1.0 m	1.000E+00	1.000E+00	FD(3,3,1)
A-3	Ra-226+D, soil density = 1.8 g/cm**3, thickness = .15 m	8.500E-01	8.500E-01	FD(3,1,2)
A-3	Ra-226+D, soil density = 1.8 g/cm**3, thickness = 0.5 m	1.000E+00	1.000E+00	FD(3,2,2)
A-3	Ra-226+D, soil density = 1.8 g/cm**3, thickness = 1.0 m	1.000E+00	1.000E+00	FD(3,3,2)
A-3				
A-3	Sr-90+D , soil density = 1.0 g/cm**3, thickness = .15 m	8.100E-01	8.100E-01	FD(4,1,1)
A-3	Sr-90+D , soil density = 1.0 g/cm**3, thickness = 0.5 m	9.800E-01	9.800E-01	FD(4,2,1)
A-3	Sr-90+D , soil density = 1.0 g/cm**3, thickness = 1.0 m	1.000E+00	1.000E+00	FD(4,3,1)
A-3	Sr-90+D , soil density = 1.8 g/cm**3, thickness = .15 m	9.000E-01	9.000E-01	FD(4,1,2)
A-3	Sr-90+D , soil density = 1.8 g/cm**3, thickness = 0.5 m	1.000E+00	1.000E+00	FD(4,2,2)
A-3	Sr-90+D , soil density = 1.8 g/cm**3, thickness = 1.0 m	1.000E+00	1.000E+00	FD(4,3,2)
B-1	Dose conversion factors for dust inhalation, mrem/pCi:			
B-1	Cs-137+D	3.200E-05	3.200E-05	DCF2(1)
B-1	Pb-210+D	2.100E-02	2.100E-02	DCF2(2)
B-1	Ra-226+D	7.900E-03	7.900E-03	DCF2(3)
B-1	Sr-90+D	1.300E-03	1.300E-03	DCF2(4)
D-1	Dose conversion factors for ingestion, mrem/pCi:			
D-1	Cs-137+D	5.000E-05	5.000E-05	DCF3(1)
D-1	Pb-210+D	6.700E-03	6.700E-03	DCF3(2)

Dose Conversion Factor (and Related) Parameter Summary (continued)

Menu	Parameter	Current Value	Default	Parameter Name
D-1	Ra-226+D	1.100E-03	1.100E-03	DCF3(3)
D-1	Sr-90+D	1.400E-04	1.400E-04	DCF3(4)
D-34	Food transfer factors:			
D-34	Cs-137+D, plant/soil concentration ratio, dimensionless	2.000E-03	2.000E-03	RTF(1,1)
D-34	Cs-137+D, beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.000E-02	3.000E-02	RTF(1,2)
D-34	Cs-137+D, milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-03	5.000E-03	RTF(1,3)
D-34				
D-34	Pb-210+D, plant/soil concentration ratio, dimensionless	6.800E-02	6.800E-02	RTF(2,1)
D-34	Pb-210+D, beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	9.900E-04	9.900E-04	RTF(2,2)
D-34	Pb-210+D, milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-05	1.000E-05	RTF(2,3)
D-34				
D-34	Ra-226+D, plant/soil concentration ratio, dimensionless	1.400E-03	1.400E-03	RTF(3,1)
D-34	Ra-226+D, beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	9.900E-04	9.900E-04	RTF(3,2)
D-34	Ra-226+D, milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-04	2.000E-04	RTF(3,3)
D-34				
D-34	Sr-90+D , plant/soil concentration ratio, dimensionless	2.000E-01	2.000E-01	RTF(4,1)
D-34	Sr-90+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.000E-04	3.000E-04	RTF(4,2)
D-34	Sr-90+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.500E-03	1.500E-03	RTF(4,3)
D-5	Bioaccumulation factors, fresh water, L/kg:			
D-5	Cs-137+D, fish	2.000E+03	2.000E+03	BIOFAC(1,1)
D-5	Cs-137+D, crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(1,2)
D-5				
D-5	Pb-210+D, fish	1.000E+02	1.000E+02	BIOFAC(2,1)
D-5	Pb-210+D, crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(2,2)
D-5				
D-5	Ra-226+D, fish	5.000E+01	5.000E+01	BIOFAC(3,1)
D-5	Ra-226+D, crustacea and mollusks	2.500E+02	2.500E+02	BIOFAC(3,2)
D-5				
D-5	Sr-90+D , fish	3.000E+01	3.000E+01	BIOFAC(4,1)
D-5	Sr-90+D , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(4,2)

Site-Specific Parameter Summary

0 Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R011	Area of contaminated zone (m**2)	3.000E+02	1.000E+04	---	AREA
R011	Thickness of contaminated zone (m)	1.500E+01	1.000E+00	---	THICK0
R011	Length parallel to aquifer flow (m)	5.000E+01	1.000E+02	---	LCZPAQ
R011	Basic radiation dose limit (mrem/yr)	1.000E+02	1.000E+02	---	BRLD
R011	Time since placement of material (yr)	8.000E+00	0.000E+00	---	TI
R011	Times for calculations (yr)	1.000E-01	1.000E+00	---	T(2)
R011	Times for calculations (yr)	2.000E-01	3.000E+00	---	T(3)
R011	Times for calculations (yr)	3.000E-01	1.000E+01	---	T(4)
R011	Times for calculations (yr)	4.000E-01	3.000E+01	---	T(5)
R011	Times for calculations (yr)	5.000E-01	1.000E+02	---	T(6)
R011	Times for calculations (yr)	7.500E-01	3.000E+02	---	T(7)
R011	Times for calculations (yr)	1.000E+00	1.000E+03	---	T(8)
R011	Times for calculations (yr)	2.000E+00	3.000E+03	---	T(9)
R011	Times for calculations (yr)	5.000E+00	1.000E+04	---	T(10)
R012	Initial principal radionuclide (pCi/g): Cs-137	2.000E-01	0.000E+00	---	S(1)
R012	Initial principal radionuclide (pCi/g): Pb-210	8.100E-01	0.000E+00	---	S(2)
R012	Initial principal radionuclide (pCi/g): Ra-226	1.500E+00	0.000E+00	---	S(3)
R012	Initial principal radionuclide (pCi/g): Sr-90	4.700E-01	0.000E+00	---	S(4)
R012	Concentration in groundwater (pCi/L): Cs-137	not used	0.000E+00	---	W(1)
R012	Concentration in groundwater (pCi/L): Pb-210	not used	0.000E+00	---	W(2)
R012	Concentration in groundwater (pCi/L): Ra-226	not used	0.000E+00	---	W(3)
R012	Concentration in groundwater (pCi/L): Sr-90	not used	0.000E+00	---	W(4)
R013	Cover depth (m)	1.500E+00	0.000E+00	---	COVER0
R013	Density of cover material (g/cm**3)	1.600E+00	1.600E+00	---	DENSCV
R013	Cover depth erosion rate (m/yr)	1.000E-03	1.000E-03	---	VCV
R013	Density of contaminated zone (g/cm**3)	1.800E+00	1.600E+00	---	DENSCZ
R013	Contaminated zone erosion rate (m/yr)	1.000E-03	1.000E-03	---	VCZ
R013	Contaminated zone total porosity	4.000E-01	4.000E-01	---	TPCZ
R013	Contaminated zone effective porosity	2.000E-01	2.000E-01	---	EPCZ
R013	Contaminated zone hydraulic conductivity (m/yr)	1.000E+01	1.000E+01	---	HCCZ
R013	Contaminated zone b parameter	5.300E+00	5.300E+00	---	BCZ
R013	Humidity in air (g/cm**3)	not used	8.000E+00	---	HUMID
R013	Evapotranspiration coefficient	6.000E-01	6.000E-01	---	EVAPTR
R013	Precipitation (m/yr)	4.560E-01	1.000E+00	---	PRECIP
R013	Irrigation (m/yr)	0.000E+00	2.000E-01	---	RI
R013	Irrigation mode	overhead	overhead	---	IDITCH
R013	Runoff coefficient	2.000E-01	2.000E-01	---	RUNOFF
R013	Watershed area for nearby stream or pond (m**2)	1.000E+06	1.000E+06	---	WAREA
R013	Accuracy for water/soil computations	1.000E-06	1.000E-03	---	EPS
R014	Density of saturated zone (g/cm**3)	1.600E+00	1.600E+00	---	DENSAQ
R014	Saturated zone total porosity	4.000E-01	4.000E-01	---	TPSZ
R014	Saturated zone effective porosity	2.000E-01	2.000E-01	---	EPSZ
R014	Saturated zone hydraulic conductivity (m/yr)	1.000E+03	1.000E+02	---	HCSZ
R014	Saturated zone hydraulic gradient	2.000E-02	2.000E-02	---	HGWT
R014	Saturated zone b parameter	5.300E+00	5.300E+00	---	BSZ
R014	Water table drop rate (m/yr)	1.000E-03	1.000E-03	---	VWT
R014	Well pump intake depth (m below water table)	5.000E+00	1.000E+01	---	DWIBWT

Site-Specific Parameter Summary (continued)

0 Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R014	Model: Nondispersion (ND) or Mass-Balance (MB)	ND	ND	---	MODEL
R014	Individual's use of groundwater (m**3/yr)	not used	1.500E+02	---	UW
R015	Number of unsaturated zone strata	1	1	---	NS
R015	Unsat. zone 1, thickness (m)	1.100E+01	4.000E+00	---	H(1)
R015	Unsat. zone 1, soil density (g/cm**3)	1.800E+00	1.600E+00	---	DENSUZ(1)
R015	Unsat. zone 1, total porosity	4.000E-01	4.000E-01	---	TPUZ(1)
R015	Unsat. zone 1, effective porosity	2.000E-01	2.000E-01	---	EPUZ(1)
R015	Unsat. zone 1, soil-specific b parameter	5.300E+00	5.300E+00	---	BUZ(1)
R015	Unsat. zone 1, hydraulic conductivity (m/yr)	1.000E+02	1.000E+02	---	HCUZ(1)
R016	Distribution coefficients for Cs-137				
R016	Contaminated zone (cm**3/g)	1.000E+03	1.000E+03	---	DCACTC(1)
R016	Unsaturated zone 1 (cm**3/g)	1.000E+03	1.000E+03	---	DCACTU(1,1)
R016	Saturated zone (cm**3/g)	1.000E+03	1.000E+03	---	DCACTS(1)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	5.404E-06	RLEACH(1)
R016	Distribution coefficients for Pb-210				
R016	Contaminated zone (cm**3/g)	1.000E+02	1.000E+02	---	DCACTC(2)
R016	Unsaturated zone 1 (cm**3/g)	1.000E+02	1.000E+02	---	DCACTU(2,1)
R016	Saturated zone (cm**3/g)	1.000E+02	1.000E+02	---	DCACTS(2)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	5.396E-05	RLEACH(2)
R016	Distribution coefficients for Ra-226				
R016	Contaminated zone (cm**3/g)	7.000E+01	7.000E+01	---	DCACTC(3)
R016	Unsaturated zone 1 (cm**3/g)	7.000E+01	7.000E+01	---	DCACTU(3,1)
R016	Saturated zone (cm**3/g)	7.000E+01	7.000E+01	---	DCACTS(3)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	7.703E-05	RLEACH(3)
R016	Distribution coefficients for Sr-90				
R016	Contaminated zone (cm**3/g)	3.000E+01	3.000E+01	---	DCACTC(4)
R016	Unsaturated zone 1 (cm**3/g)	3.000E+01	3.000E+01	---	DCACTU(4,1)
R016	Saturated zone (cm**3/g)	3.000E+01	3.000E+01	---	DCACTS(4)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.792E-04	RLEACH(4)
R017	Inhalation rate (m**3/yr)	8.400E+03	8.400E+03	---	INHALR
R017	Mass loading for inhalation (g/m**3)	2.000E-04	2.000E-04	---	MLINH
R017	Dilution length for airborne dust, inhalation (m)	3.000E+00	3.000E+00	---	LM
R017	Exposure duration	3.000E+01	3.000E+01	---	ED
R017	Shielding factor, inhalation	4.000E-01	4.000E-01	---	SHF3
R017	Shielding factor, external gamma	7.000E-01	7.000E-01	---	SHF1
R017	Fraction of time spent indoors	5.000E-01	5.000E-01	---	FIND
R017	Fraction of time spent outdoors (on site)	2.500E-01	2.500E-01	---	FOTD
R017	Shape factor, external gamma	1.000E+00	1.000E+00	---	FS1

Site-Specific Parameter Summary (continued)

0 Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R017	Fractions of annular areas within AREA:				
R017	Outer annular radius (m) = √(1/π)	not used	1.000E+00	---	FRACA(1)
R017	Outer annular radius (m) = √(10/π)	not used	1.000E+00	---	FRACA(2)
R017	Outer annular radius (m) = √(20/π)	not used	1.000E+00	---	FRACA(3)
R017	Outer annular radius (m) = √(50/π)	not used	1.000E+00	---	FRACA(4)
R017	Outer annular radius (m) = √(100/π)	not used	1.000E+00	---	FRACA(5)
R017	Outer annular radius (m) = √(200/π)	not used	1.000E+00	---	FRACA(6)
R017	Outer annular radius (m) = √(500/π)	not used	1.000E+00	---	FRACA(7)
R017	Outer annular radius (m) = √(1000/π)	not used	1.000E+00	---	FRACA(8)
R017	Outer annular radius (m) = √(5000/π)	not used	1.000E+00	---	FRACA(9)
R017	Outer annular radius (m) = √(1.E+04/π)	not used	1.000E+00	---	FRACA(10)
R017	Outer annular radius (m) = √(1.E+05/π)	not used	0.000E+00	---	FRACA(11)
R017	Outer annular radius (m) = √(1.E+06/π)	not used	0.000E+00	---	FRACA(12)
R018	Fruits, vegetables and grain consumption (kg/yr)	1.600E+02	1.600E+02	---	DIET(1)
R018	Leafy vegetable consumption (kg/yr)	1.400E+01	1.400E+01	---	DIET(2)
R018	Milk consumption (L/yr)	9.200E+01	9.200E+01	---	DIET(3)
R018	Meat and poultry consumption (kg/yr)	6.300E+01	6.300E+01	---	DIET(4)
R018	Fish consumption (kg/yr)	5.400E+00	5.400E+00	---	DIET(5)
R018	Other seafood consumption (kg/yr)	0.000E+00	9.000E-01	---	DIET(6)
R018	Soil ingestion rate (g/yr)	3.650E+01	3.650E+01	---	SOIL
R018	Drinking water intake (L/yr)	not used	5.100E+02	---	DWI
R018	Fraction of drinking water from site	not used	1.000E+00	---	FDW
R018	Fraction of aquatic food from site	0.000E+00	5.000E-01	---	FR9
R019	Livestock fodder intake for meat (kg/day)	6.800E+01	6.800E+01	---	LFI5
R019	Livestock fodder intake for milk (kg/day)	5.500E+01	5.500E+01	---	LFI6
R019	Livestock water intake for meat (L/day)	5.000E+01	5.000E+01	---	LWI5
R019	Livestock water intake for milk (L/day)	1.600E+02	1.600E+02	---	LWI6
R019	Mass loading for foliar deposition (g/m**3)	1.000E-04	1.000E-04	---	MLFD
R019	Depth of soil mixing layer (m)	1.500E-01	1.500E-01	---	DM
R019	Depth of roots (m)	9.000E-01	9.000E-01	---	DROOT
R019	Drinking water fraction from ground water	not used	1.000E+00	---	FGWDW
R019	Livestock water fraction from ground water	9.000E-01	1.000E+00	---	FGWLW
R019	Irrigation fraction from ground water	1.000E+00	1.000E+00	---	FGWIR
R021	Thickness of building foundation (m)	not used	1.500E-01	---	FLOOR
R021	Bulk density of building foundation (g/cm**3)	not used	2.400E+00	---	DENSFL
R021	Total porosity of the cover material	not used	4.000E-01	---	TPCV
R021	Total porosity of the building foundation	not used	1.000E-01	---	TPFL
R021	Volumetric water content of the cover material	not used	1.000E-01	---	PH2OCV
R021	Volumetric water content of the foundation	not used	5.000E-02	---	PH2OFL
R021	Diffusion coefficient for radon gas (m/sec):				
R021	in cover material	not used	2.000E-06	---	DIFCV
R021	in foundation material	not used	2.000E-08	---	DIFFL
R021	in contaminated zone soil	not used	2.000E-06	---	DIFCZ
R021	Radon vertical dimension of mixing (m)	not used	2.000E+00	---	HMIX
R021	Average annual wind speed (m/sec)	not used	2.000E+00	---	WIND
R021	Average building air exchange rate (1/hr)	not used	1.000E+00	---	REXG
R021	Height of the building (room) (m)	not used	2.500E+00	---	HRM
R021	Building interior area factor	not used	0.000E+00	---	FAI

Site-Specific Parameter Summary (continued)

0 Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R021	Building depth below ground surface (m)	not used	1.000E+00	---	DMFL
R021	Emanating power of Rn-222 gas	not used	2.000E-01	---	EMANA(1)
R021	Emanating power of Rn-220 gas	not used	1.000E-01	---	EMANA(2)

Summary of Pathway Selections

Pathway	User Selection
1 -- external gamma	active
2 -- inhalation	active
3 -- plant ingestion	active
4 -- meat ingestion	active
5 -- milk ingestion	active
6 -- aquatic foods	active
7 -- drinking water	suppressed
8 -- soil ingestion	active
9 -- radon	suppressed

Summary : LEHR Residual Soil Contamination - Strontium-90 Leach Field
File : LEHR-RA2.DAT

Contaminated Zone Dimensions	
Area:	300.00 square meters
Thickness:	15.00 meters
Cover Depth:	1.50 meters

Initial Soil Concentrations, pCi/g	
Cs-137	2.000E-01
Pb-210	8.100E-01
Ra-226	1.500E+00
Sr-90	4.700E-01

0

Total Dose TDOSE(t), mrem/yr
Basic Radiation Dose Limit = 100 mrem/yr
Total Mixture Sum M(t) = Fraction of Basic Dose Limit Received at Time (t)

t (years):	0.000E+00	1.000E-01	2.000E-01	3.000E-01	4.000E-01	5.000E-01	7.500E-01	1.000E+00	2.000E+00	5.000E+00
TDOSE(t):	1.228E-06	1.229E-06	1.230E-06	1.232E-06	1.233E-06	1.234E-06	1.237E-06	1.240E-06	1.253E-06	1.291E-06
M(t):	1.228E-08	1.229E-08	1.230E-08	1.232E-08	1.233E-08	1.234E-08	1.237E-08	1.240E-08	1.253E-08	1.291E-08

0Maximum TDOSE(t): 1.291E-06 mrem/yr at t = 5.000E+00 years

Summary : LEHR Residual Soil Contamination - Strontium-90 Leach Field
File : LEHR-SR9.DAT

Dose Conversion Factor (and Related) Parameter Summary

0 Menu	Parameter	Current Value	Default	Parameter Name
A-1	Ground external gamma, volume DCF's, (mrem/yr)/(pCi/cm**3):			
A-1	Pb-210+D, soil density = 1.0 g/cm**3	4.870E-03	4.870E-03	DCF1(1,1)
A-1	Pb-210+D, soil density = 1.8 g/cm**3	2.310E-03	2.310E-03	DCF1(1,2)
A-1				
A-1	Ra-226+D, soil density = 1.0 g/cm**3	1.550E+01	1.550E+01	DCF1(2,1)
A-1	Ra-226+D, soil density = 1.8 g/cm**3	8.560E+00	8.560E+00	DCF1(2,2)
A-1				
A-1	Sr-90+D , soil density = 1.0 g/cm**3	0.000E+00	0.000E+00	DCF1(3,1)
A-1	Sr-90+D , soil density = 1.8 g/cm**3	0.000E+00	0.000E+00	DCF1(3,2)
A-3	Depth factors, ground external gamma, dimensionless:			
A-3	Pb-210+D, soil density = 1.0 g/cm**3, thickness = .15 m	8.800E-01	8.800E-01	FD(1,1,1)
A-3	Pb-210+D, soil density = 1.0 g/cm**3, thickness = 0.5 m	1.000E+00	1.000E+00	FD(1,2,1)
A-3	Pb-210+D, soil density = 1.0 g/cm**3, thickness = 1.0 m	1.000E+00	1.000E+00	FD(1,3,1)
A-3	Pb-210+D, soil density = 1.8 g/cm**3, thickness = .15 m	9.700E-01	9.700E-01	FD(1,1,2)
A-3	Pb-210+D, soil density = 1.8 g/cm**3, thickness = 0.5 m	1.000E+00	1.000E+00	FD(1,2,2)
A-3	Pb-210+D, soil density = 1.8 g/cm**3, thickness = 1.0 m	1.000E+00	1.000E+00	FD(1,3,2)
A-3				
A-3	Ra-226+D, soil density = 1.0 g/cm**3, thickness = .15 m	6.300E-01	6.300E-01	FD(2,1,1)
A-3	Ra-226+D, soil density = 1.0 g/cm**3, thickness = 0.5 m	9.200E-01	9.200E-01	FD(2,2,1)
A-3	Ra-226+D, soil density = 1.0 g/cm**3, thickness = 1.0 m	1.000E+00	1.000E+00	FD(2,3,1)
A-3	Ra-226+D, soil density = 1.8 g/cm**3, thickness = .15 m	8.500E-01	8.500E-01	FD(2,1,2)
A-3	Ra-226+D, soil density = 1.8 g/cm**3, thickness = 0.5 m	1.000E+00	1.000E+00	FD(2,2,2)
A-3	Ra-226+D, soil density = 1.8 g/cm**3, thickness = 1.0 m	1.000E+00	1.000E+00	FD(2,3,2)
A-3				
A-3	Sr-90+D , soil density = 1.0 g/cm**3, thickness = .15 m	8.100E-01	8.100E-01	FD(3,1,1)
A-3	Sr-90+D , soil density = 1.0 g/cm**3, thickness = 0.5 m	9.800E-01	9.800E-01	FD(3,2,1)
A-3	Sr-90+D , soil density = 1.0 g/cm**3, thickness = 1.0 m	1.000E+00	1.000E+00	FD(3,3,1)
A-3	Sr-90+D , soil density = 1.8 g/cm**3, thickness = .15 m	9.000E-01	9.000E-01	FD(3,1,2)
A-3	Sr-90+D , soil density = 1.8 g/cm**3, thickness = 0.5 m	1.000E+00	1.000E+00	FD(3,2,2)
A-3	Sr-90+D , soil density = 1.8 g/cm**3, thickness = 1.0 m	1.000E+00	1.000E+00	FD(3,3,2)
B-1	Dose conversion factors for dust inhalation, mrem/pCi:			
B-1	Pb-210+D	2.100E-02	2.100E-02	DCF2(1)
B-1	Ra-226+D	7.900E-03	7.900E-03	DCF2(2)
B-1	Sr-90+D	1.300E-03	1.300E-03	DCF2(3)
D-1	Dose conversion factors for ingestion, mrem/pCi:			
D-1	Pb-210+D	6.700E-03	6.700E-03	DCF3(1)
D-1	Ra-226+D	1.100E-03	1.100E-03	DCF3(2)
D-1	Sr-90+D	1.400E-04	1.400E-04	DCF3(3)
D-34	Food transfer factors:			
D-34	Pb-210+D, plant/soil concentration ratio, dimensionless	6.800E-02	6.800E-02	RTF(1,1)
D-34	Pb-210+D, beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	9.900E-04	9.900E-04	RTF(1,2)
D-34	Pb-210+D, milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-05	1.000E-05	RTF(1,3)
D-34				
D-34	Ra-226+D, plant/soil concentration ratio, dimensionless	1.400E-03	1.400E-03	RTF(2,1)
D-34	Ra-226+D, beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	9.900E-04	9.900E-04	RTF(2,2)
D-34	Ra-226+D, milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-04	2.000E-04	RTF(2,3)
D-34				

Dose Conversion Factor (and Related) Parameter Summary (continued)

0 Menu	Parameter	Current Value	Default	Parameter Name
D-34	Sr-90+D , plant/soil concentration ratio, dimensionless	2.000E-01	2.000E-01	RTF(3,1)
D-34	Sr-90+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.000E-04	3.000E-04	RTF(3,2)
D-34	Sr-90+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.500E-03	1.500E-03	RTF(3,3)
D-5	Bioaccumulation factors, fresh water, L/kg:			
D-5	Pb-210+D, fish	1.000E+02	1.000E+02	BIOFAC(1,1)
D-5	Pb-210+D, crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(1,2)
D-5				
D-5	Ra-226+D, fish	5.000E+01	5.000E+01	BIOFAC(2,1)
D-5	Ra-226+D, crustacea and mollusks	2.500E+02	2.500E+02	BIOFAC(2,2)
D-5				
D-5	Sr-90+D , fish	3.000E+01	3.000E+01	BIOFAC(3,1)
D-5	Sr-90+D , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(3,2)

Summary : LEHR Residual Soil Contamination - Strontium-90 Leach Field
File : LEHR-SR9.DAT

Site-Specific Parameter Summary

0 Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R011	Area of contaminated zone (m**2)	1.600E+02	1.000E+04	---	AREA
R011	Thickness of contaminated zone (m)	1.500E+01	1.000E+00	---	THICKO
R011	Length parallel to aquifer flow (m)	4.000E+01	1.000E+02	---	LCZPAQ
R011	Basic radiation dose limit (mrem/yr)	1.000E+02	1.000E+02	---	BRLD
R011	Time since placement of material (yr)	8.000E+00	0.000E+00	---	TI
R011	Times for calculations (yr)	1.000E-01	1.000E+00	---	T(2)
R011	Times for calculations (yr)	2.000E-01	3.000E+00	---	T(3)
R011	Times for calculations (yr)	3.000E-01	1.000E+01	---	T(4)
R011	Times for calculations (yr)	4.000E-01	3.000E+01	---	T(5)
R011	Times for calculations (yr)	5.000E-01	1.000E+02	---	T(6)
R011	Times for calculations (yr)	7.500E-01	3.000E+02	---	T(7)
R011	Times for calculations (yr)	1.000E+00	1.000E+03	---	T(8)
R011	Times for calculations (yr)	2.000E+00	3.000E+03	---	T(9)
R011	Times for calculations (yr)	5.000E+00	1.000E+04	---	T(10)
R012	Initial principal radionuclide (pCi/g): Ra-226	1.000E-01	0.000E+00	---	S(2)
R012	Initial principal radionuclide (pCi/g): Sr-90	1.000E-01	0.000E+00	---	S(3)
R012	Concentration in groundwater (pCi/L): Ra-226	not used	0.000E+00	---	W(2)
R012	Concentration in groundwater (pCi/L): Sr-90	not used	0.000E+00	---	W(3)
R013	Cover depth (m)	1.000E+00	0.000E+00	---	COVERO
R013	Density of cover material (g/cm**3)	1.600E+00	1.600E+00	---	DENSCV
R013	Cover depth erosion rate (m/yr)	1.000E-03	1.000E-03	---	VCV
R013	Density of contaminated zone (g/cm**3)	1.800E+00	1.600E+00	---	DENSCZ
R013	Contaminated zone erosion rate (m/yr)	1.000E-03	1.000E-03	---	VCZ
R013	Contaminated zone total porosity	4.000E-01	4.000E-01	---	TPCZ
R013	Contaminated zone effective porosity	2.000E-01	2.000E-01	---	EPCZ
R013	Contaminated zone hydraulic conductivity (m/yr)	1.000E+01	1.000E+01	---	HCCZ
R013	Contaminated zone b parameter	5.300E+00	5.300E+00	---	BCZ
R013	Humidity in air (g/cm**3)	not used	8.000E+00	---	HUMID
R013	Evapotranspiration coefficient	6.000E-01	6.000E-01	---	EVAPTR
R013	Precipitation (m/yr)	4.560E-01	1.000E+00	---	PRECIP
R013	Irrigation (m/yr)	0.000E+00	2.000E-01	---	RI
R013	Irrigation mode	overhead	overhead	---	IDITCH
R013	Runoff coefficient	2.000E-01	2.000E-01	---	RUNOFF
R013	Watershed area for nearby stream or pond (m**2)	1.000E+06	1.000E+06	---	WAREA
R013	Accuracy for water/soil computations	1.000E-06	1.000E-03	---	EPS
R014	Density of saturated zone (g/cm**3)	1.600E+00	1.600E+00	---	DENSAQ
R014	Saturated zone total porosity	4.000E-01	4.000E-01	---	TPSZ
R014	Saturated zone effective porosity	2.000E-01	2.000E-01	---	EPSZ
R014	Saturated zone hydraulic conductivity (m/yr)	1.000E+03	1.000E+02	---	HCSZ
R014	Saturated zone hydraulic gradient	2.000E-02	2.000E-02	---	HGWT
R014	Saturated zone b parameter	5.300E+00	5.300E+00	---	BSZ
R014	Water table drop rate (m/yr)	1.000E-03	1.000E-03	---	VWT
R014	Well pump intake depth (m below water table)	5.000E+00	1.000E+01	---	DWIBWT
R014	Model: Nondispersion (ND) or Mass-Balance (MB)	ND	ND	---	MODEL
R014	Individual's use of groundwater (m**3/yr)	not used	1.500E+02	---	UW
R015	Number of unsaturated zone strata	1	1	---	NS

Site-Specific Parameter Summary (continued)

0 Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R015	Unsat. zone 1, thickness (m)	1.100E+01	4.000E+00	---	H(1)
R015	Unsat. zone 1, soil density (g/cm**3)	1.800E+00	1.600E+00	---	DENSUZ(1)
R015	Unsat. zone 1, total porosity	4.000E-01	4.000E-01	---	TPUZ(1)
R015	Unsat. zone 1, effective porosity	2.000E-01	2.000E-01	---	EPUZ(1)
R015	Unsat. zone 1, soil-specific b parameter	5.300E+00	5.300E+00	---	BUZ(1)
R015	Unsat. zone 1, hydraulic conductivity (m/yr)	1.000E+02	1.000E+02	---	HCUZ(1)
R016	Distribution coefficients for Ra-226				
R016	Contaminated zone (cm**3/g)	7.000E+01	7.000E+01	---	DCACTC(2)
R016	Unsaturated zone 1 (cm**3/g)	7.000E+01	7.000E+01	---	DCACTU(2,1)
R016	Saturated zone (cm**3/g)	7.000E+01	7.000E+01	---	DCACTS(2)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	7.703E-05	RLEACH(2)
R016	Distribution coefficients for Sr-90				
R016	Contaminated zone (cm**3/g)	3.000E+01	3.000E+01	---	DCACTC(3)
R016	Unsaturated zone 1 (cm**3/g)	3.000E+01	3.000E+01	---	DCACTU(3,1)
R016	Saturated zone (cm**3/g)	3.000E+01	3.000E+01	---	DCACTS(3)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.792E-04	RLEACH(3)
R016	Distribution coefficients for daughter Pb-210				
R016	Contaminated zone (cm**3/g)	1.000E+02	1.000E+02	---	DCACTC(1)
R016	Unsaturated zone 1 (cm**3/g)	1.000E+02	1.000E+02	---	DCACTU(1,1)
R016	Saturated zone (cm**3/g)	1.000E+02	1.000E+02	---	DCACTS(1)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	5.396E-05	RLEACH(1)
R017	Inhalation rate (m**3/yr)	8.400E+03	8.400E+03	---	INHALR
R017	Mass loading for inhalation (g/m**3)	2.000E-04	2.000E-04	---	MLINH
R017	Dilution length for airborne dust, inhalation (m)	3.000E+00	3.000E+00	---	LM
R017	Exposure duration	3.000E+01	3.000E+01	---	ED
R017	Shielding factor, inhalation	4.000E-01	4.000E-01	---	SHF3
R017	Shielding factor, external gamma	7.000E-01	7.000E-01	---	SHF1
R017	Fraction of time spent indoors	5.000E-01	5.000E-01	---	FIND
R017	Fraction of time spent outdoors (on site)	2.500E-01	2.500E-01	---	FOTD
R017	Shape factor, external gamma	1.000E+00	1.000E+00	---	FS1
R017	Fractions of annular areas within AREA:				
R017	Outer annular radius (m) = $\sqrt{(1/\pi)}$	not used	1.000E+00	---	FRACA(1)
R017	Outer annular radius (m) = $\sqrt{(10/\pi)}$	not used	1.000E+00	---	FRACA(2)
R017	Outer annular radius (m) = $\sqrt{(20/\pi)}$	not used	1.000E+00	---	FRACA(3)
R017	Outer annular radius (m) = $\sqrt{(50/\pi)}$	not used	1.000E+00	---	FRACA(4)
R017	Outer annular radius (m) = $\sqrt{(100/\pi)}$	not used	1.000E+00	---	FRACA(5)
R017	Outer annular radius (m) = $\sqrt{(200/\pi)}$	not used	1.000E+00	---	FRACA(6)
R017	Outer annular radius (m) = $\sqrt{(500/\pi)}$	not used	1.000E+00	---	FRACA(7)
R017	Outer annular radius (m) = $\sqrt{(1000/\pi)}$	not used	1.000E+00	---	FRACA(8)
R017	Outer annular radius (m) = $\sqrt{(5000/\pi)}$	not used	1.000E+00	---	FRACA(9)
R017	Outer annular radius (m) = $\sqrt{(1.E+04/\pi)}$	not used	1.000E+00	---	FRACA(10)
R017	Outer annular radius (m) = $\sqrt{(1.E+05/\pi)}$	not used	0.000E+00	---	FRACA(11)
R017	Outer annular radius (m) = $\sqrt{(1.E+06/\pi)}$	not used	0.000E+00	---	FRACA(12)
R018	Fruits, vegetables and grain consumption (kg/yr)	1.600E+02	1.600E+02	---	DIET(1)
R018	Leafy vegetable consumption (kg/yr)	1.400E+01	1.400E+01	---	DIET(2)

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R018	Milk consumption (L/yr)	9.200E+01	9.200E+01	---	DIET(3)
R018	Meat and poultry consumption (kg/yr)	6.300E+01	6.300E+01	---	DIET(4)
R018	Fish consumption (kg/yr)	5.400E+00	5.400E+00	---	DIET(5)
R018	Other seafood consumption (kg/yr)	0.000E+00	9.000E-01	---	DIET(6)
R018	Soil ingestion rate (g/yr)	3.650E+01	3.650E+01	---	SOIL
R018	Drinking water intake (L/yr)	not used	5.100E+02	---	DWI
R018	Fraction of drinking water from site	not used	1.000E+00	---	FDW
R018	Fraction of aquatic food from site	0.000E+00	5.000E-01	---	FR9
R019	Livestock fodder intake for meat (kg/day)	6.800E+01	6.800E+01	---	LFI5
R019	Livestock fodder intake for milk (kg/day)	5.500E+01	5.500E+01	---	LFI6
R019	Livestock water intake for meat (L/day)	5.000E+01	5.000E+01	---	LWI5
R019	Livestock water intake for milk (L/day)	1.600E+02	1.600E+02	---	LWI6
R019	Mass loading for foliar deposition (g/m**3)	1.000E-04	1.000E-04	---	MLFD
R019	Depth of soil mixing layer (m)	1.500E-01	1.500E-01	---	DM
R019	Depth of roots (m)	9.000E-01	9.000E-01	---	DROOT
R019	Drinking water fraction from ground water	not used	1.000E+00	---	FGWDW
R019	Livestock water fraction from ground water	9.000E-01	1.000E+00	---	FGWLW
R019	Irrigation fraction from ground water	1.000E+00	1.000E+00	---	FGWIR
R021	Thickness of building foundation (m)	not used	1.500E-01	---	FLOOR
R021	Bulk density of building foundation (g/cm**3)	not used	2.400E+00	---	DENSFL
R021	Total porosity of the cover material	not used	4.000E-01	---	TPCV
R021	Total porosity of the building foundation	not used	1.000E-01	---	TPFL
R021	Volumetric water content of the cover material	not used	1.000E-01	---	PH2OCV
R021	Volumetric water content of the foundation	not used	5.000E-02	---	PH2OFL
R021	Diffusion coefficient for radon gas (m/sec):				
R021	in cover material	not used	2.000E-06	---	DIFCV
R021	in foundation material	not used	2.000E-08	---	DIFFL
R021	in contaminated zone soil	not used	2.000E-06	---	DIFCZ
R021	Radon vertical dimension of mixing (m)	not used	2.000E+00	---	HMIX
R021	Average annual wind speed (m/sec)	not used	2.000E+00	---	WIND
R021	Average building air exchange rate (1/hr)	not used	1.000E+00	---	REXG
R021	Height of the building (room) (m)	not used	2.500E+00	---	HRM
R021	Building interior area factor	not used	0.000E+00	---	FAI
R021	Building depth below ground surface (m)	not used	1.000E+00	---	DMFL
R021	Emanating power of Rn-222 gas	not used	2.000E-01	---	EMANA(1)
R021	Emanating power of Rn-220 gas	not used	1.000E-01	---	EMANA(2)

Summary of Pathway Selections

Pathway	User Selection
1 -- external gamma	active
2 -- inhalation	active
3 -- plant ingestion	active
4 -- meat ingestion	active
5 -- milk ingestion	active
6 -- aquatic foods	active
7 -- drinking water	suppressed
8 -- soil ingestion	active
9 -- radon	suppressed

Summary : LEHR Residual Soil Contamination - Strontium-90 Leach Field
File : LEHR-SR9.DAT

Contaminated Zone Dimensions		Initial Soil Concentrations, pCi/g	
Area:	160.00 square meters	Ra-226	1.000E-01
Thickness:	15.00 meters	Sr-90	1.000E-01
Cover Depth:	1.00 meters		

Total Dose TDOSE(t), mrem/yr
Basic Radiation Dose Limit = 100 mrem/yr
Total Mixture Sum M(t) = Fraction of Basic Dose Limit Received at Time (t)

t (years):	0.000E+00	1.000E-01	2.000E-01	3.000E-01	4.000E-01	5.000E-01	7.500E-01	1.000E+00	2.000E+00	5.000E+00
TDOSE(t):	1.402E-05	1.403E-05	1.404E-05	1.406E-05	1.407E-05	1.409E-05	1.412E-05	1.416E-05	1.430E-05	1.474E-05
M(t):	1.402E-07	1.403E-07	1.404E-07	1.406E-07	1.407E-07	1.409E-07	1.412E-07	1.416E-07	1.430E-07	1.474E-07

Maximum TDOSE(t): 1.474E-05 mrem/yr at t = 5.000E+00 years

Dose Conversion Factor (and Related) Parameter Summary

0 Menu	Parameter	Current Value	Default	Parameter Name
A-1	Ground external gamma, volume DCF's, (mrem/yr)/(pCi/cm**3):			
A-1	H-3 , soil density = 1.0 g/cm**3	0.000E+00	0.000E+00	DCF1(1,1)
A-1	H-3 , soil density = 1.8 g/cm**3	0.000E+00	0.000E+00	DCF1(1,2)
A-1				
A-1	Ra-228+D, soil density = 1.0 g/cm**3	8.180E+00	8.180E+00	DCF1(2,1)
A-1	Ra-228+D, soil density = 1.8 g/cm**3	4.510E+00	4.510E+00	DCF1(2,2)
A-1				
A-1	Th-228+D, soil density = 1.0 g/cm**3	1.330E+01	1.330E+01	DCF1(3,1)
A-1	Th-228+D, soil density = 1.8 g/cm**3	7.360E+00	7.360E+00	DCF1(3,2)
A-1				
A-1	Th-232 , soil density = 1.0 g/cm**3	1.350E-03	1.350E-03	DCF1(4,1)
A-1	Th-232 , soil density = 1.8 g/cm**3	6.040E-04	6.040E-04	DCF1(4,2)
A-3	Depth factors, ground external gamma, dimensionless:			
A-3	H-3 , soil density = 1.0 g/cm**3, thickness = .15 m	1.000E+00	1.000E+00	FD(1,1,1)
A-3	H-3 , soil density = 1.0 g/cm**3, thickness = 0.5 m	1.000E+00	1.000E+00	FD(1,2,1)
A-3	H-3 , soil density = 1.0 g/cm**3, thickness = 1.0 m	1.000E+00	1.000E+00	FD(1,3,1)
A-3	H-3 , soil density = 1.8 g/cm**3, thickness = .15 m	1.000E+00	1.000E+00	FD(1,1,2)
A-3	H-3 , soil density = 1.8 g/cm**3, thickness = 0.5 m	1.000E+00	1.000E+00	FD(1,2,2)
A-3	H-3 , soil density = 1.8 g/cm**3, thickness = 1.0 m	1.000E+00	1.000E+00	FD(1,3,2)
A-3				
A-3	Ra-228+D, soil density = 1.0 g/cm**3, thickness = .15 m	6.800E-01	6.800E-01	FD(2,1,1)
A-3	Ra-228+D, soil density = 1.0 g/cm**3, thickness = 0.5 m	9.700E-01	9.700E-01	FD(2,2,1)
A-3	Ra-228+D, soil density = 1.0 g/cm**3, thickness = 1.0 m	1.000E+00	1.000E+00	FD(2,3,1)
A-3	Ra-228+D, soil density = 1.8 g/cm**3, thickness = .15 m	8.500E-01	8.500E-01	FD(2,1,2)
A-3	Ra-228+D, soil density = 1.8 g/cm**3, thickness = 0.5 m	1.000E+00	1.000E+00	FD(2,2,2)
A-3	Ra-228+D, soil density = 1.8 g/cm**3, thickness = 1.0 m	1.000E+00	1.000E+00	FD(2,3,2)
A-3				
A-3	Th-228+D, soil density = 1.0 g/cm**3, thickness = .15 m	6.100E-01	6.100E-01	FD(3,1,1)
A-3	Th-228+D, soil density = 1.0 g/cm**3, thickness = 0.5 m	9.400E-01	9.400E-01	FD(3,2,1)
A-3	Th-228+D, soil density = 1.0 g/cm**3, thickness = 1.0 m	1.000E+00	1.000E+00	FD(3,3,1)
A-3	Th-228+D, soil density = 1.8 g/cm**3, thickness = .15 m	7.500E-01	7.500E-01	FD(3,1,2)
A-3	Th-228+D, soil density = 1.8 g/cm**3, thickness = 0.5 m	1.000E+00	1.000E+00	FD(3,2,2)
A-3	Th-228+D, soil density = 1.8 g/cm**3, thickness = 1.0 m	1.000E+00	1.000E+00	FD(3,3,2)
A-3				
A-3	Th-232 , soil density = 1.0 g/cm**3, thickness = .15 m	9.500E-01	9.500E-01	FD(4,1,1)
A-3	Th-232 , soil density = 1.0 g/cm**3, thickness = 0.5 m	1.000E+00	1.000E+00	FD(4,2,1)
A-3	Th-232 , soil density = 1.0 g/cm**3, thickness = 1.0 m	1.000E+00	1.000E+00	FD(4,3,1)
A-3	Th-232 , soil density = 1.8 g/cm**3, thickness = .15 m	1.000E+00	1.000E+00	FD(4,1,2)
A-3	Th-232 , soil density = 1.8 g/cm**3, thickness = 0.5 m	1.000E+00	1.000E+00	FD(4,2,2)
A-3	Th-232 , soil density = 1.8 g/cm**3, thickness = 1.0 m	1.000E+00	1.000E+00	FD(4,3,2)
B-1	Dose conversion factors for dust inhalation, mrem/pCi:			
B-1	H-3	6.300E-08	6.300E-08	DCF2(1)
B-1	Ra-228+D	4.500E-03	4.500E-03	DCF2(2)
B-1	Th-228+D	3.100E-01	3.100E-01	DCF2(3)
B-1	Th-232	1.600E+00	1.600E+00	DCF2(4)
D-1	Dose conversion factors for ingestion, mrem/pCi:			
D-1	H-3	6.300E-08	6.300E-08	DCF3(1)
D-1	Ra-228+D	1.200E-03	1.200E-03	DCF3(2)

Dose Conversion Factor (and Related) Parameter Summary (continued)

Menu	Parameter	Current Value	Default	Parameter Name
D-1	Th-228+D	7.500E-04	7.500E-04	DCF3(3)
D-1	Th-232	2.800E-03	2.800E-03	DCF3(4)
D-34	Food transfer factors:			
D-34	H-3 , plant/soil concentration ratio, dimensionless	0.000E+00	0.000E+00	RTF(1,1)
D-34	H-3 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	0.000E+00	0.000E+00	RTF(1,2)
D-34	H-3 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	0.000E+00	0.000E+00	RTF(1,3)
D-34				
D-34	Ra-228+D, plant/soil concentration ratio, dimensionless	1.400E-03	1.400E-03	RTF(2,1)
D-34	Ra-228+D, beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	9.900E-04	9.900E-04	RTF(2,2)
D-34	Ra-228+D, milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-04	2.000E-04	RTF(2,3)
D-34				
D-34	Th-228+D, plant/soil concentration ratio, dimensionless	4.200E-03	4.200E-03	RTF(3,1)
D-34	Th-228+D, beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	5.000E-03	5.000E-03	RTF(3,2)
D-34	Th-228+D, milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.500E-06	2.500E-06	RTF(3,3)
D-34				
D-34	Th-232 , plant/soil concentration ratio, dimensionless	4.200E-03	4.200E-03	RTF(4,1)
D-34	Th-232 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	5.000E-03	5.000E-03	RTF(4,2)
D-34	Th-232 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.500E-06	2.500E-06	RTF(4,3)
D-5	Bioaccumulation factors, fresh water, L/kg:			
D-5	H-3 , fish	9.000E-01	9.000E-01	BIOFAC(1,1)
D-5	H-3 , crustacea and mollusks	9.000E-01	9.000E-01	BIOFAC(1,2)
D-5				
D-5	Ra-228+D, fish	5.000E+01	5.000E+01	BIOFAC(2,1)
D-5	Ra-228+D, crustacea and mollusks	2.500E+02	2.500E+02	BIOFAC(2,2)
D-5				
D-5	Th-228+D, fish	3.000E+01	3.000E+01	BIOFAC(3,1)
D-5	Th-228+D, crustacea and mollusks	5.000E+02	5.000E+02	BIOFAC(3,2)
D-5				
D-5	Th-232 , fish	3.000E+01	3.000E+01	BIOFAC(4,1)
D-5	Th-232 , crustacea and mollusks	5.000E+02	5.000E+02	BIOFAC(4,2)

Summary : LEHR Residual Soil Contamination - SW Chemical Area
File : LEHR-SWC.DAT

Site-Specific Parameter Summary

0 Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R011	Area of contaminated zone (m**2)	2.500E+02	1.000E+04	---	AREA
R011	Thickness of contaminated zone (m)	1.500E+01	1.000E+00	---	THICKO
R011	Length parallel to aquifer flow (m)	5.000E+01	1.000E+02	---	LCZPAQ
R011	Basic radiation dose limit (mrem/yr)	1.000E+02	1.000E+02	---	BRLD
R011	Time since placement of material (yr)	5.000E+00	0.000E+00	---	TI
R011	Times for calculations (yr)	1.000E-01	1.000E+00	---	T(2)
R011	Times for calculations (yr)	2.000E-01	3.000E+00	---	T(3)
R011	Times for calculations (yr)	3.000E-01	1.000E+01	---	T(4)
R011	Times for calculations (yr)	4.000E-01	3.000E+01	---	T(5)
R011	Times for calculations (yr)	5.000E-01	1.000E+02	---	T(6)
R011	Times for calculations (yr)	7.500E-01	3.000E+02	---	T(7)
R011	Times for calculations (yr)	1.000E+00	1.000E+03	---	T(8)
R011	Times for calculations (yr)	2.000E+00	3.000E+03	---	T(9)
R011	Times for calculations (yr)	5.000E+00	1.000E+04	---	T(10)
R012	Initial principal radionuclide (pCi/g): H-3	4.500E+00	0.000E+00	---	S(1)
R012	Initial principal radionuclide (pCi/g): Th-232	5.000E-02	0.000E+00	---	S(4)
R012	Concentration in groundwater (pCi/L): H-3	not used	0.000E+00	---	W(1)
R012	Concentration in groundwater (pCi/L): Th-232	not used	0.000E+00	---	W(4)
R013	Cover depth (m)	1.000E+00	0.000E+00	---	COVERO
R013	Density of cover material (g/cm**3)	1.600E+00	1.600E+00	---	DENSCV
R013	Cover depth erosion rate (m/yr)	1.000E-03	1.000E-03	---	VCV
R013	Density of contaminated zone (g/cm**3)	1.800E+00	1.600E+00	---	DENSCZ
R013	Contaminated zone erosion rate (m/yr)	1.000E-03	1.000E-03	---	VCZ
R013	Contaminated zone total porosity	4.000E-01	4.000E-01	---	TPCZ
R013	Contaminated zone effective porosity	2.000E-01	2.000E-01	---	EPCZ
R013	Contaminated zone hydraulic conductivity (m/yr)	1.000E+01	1.000E+01	---	HCCZ
R013	Contaminated zone b parameter	5.300E+00	5.300E+00	---	BCZ
R013	Humidity in air (g/cm**3)	8.000E+00	8.000E+00	---	HUMID
R013	Evapotranspiration coefficient	6.000E-01	6.000E-01	---	EVAPTR
R013	Precipitation (m/yr)	4.560E-01	1.000E+00	---	PRECIP
R013	Irrigation (m/yr)	0.000E+00	2.000E-01	---	RI
R013	Irrigation mode	overhead	overhead	---	IDITCH
R013	Runoff coefficient	2.000E-01	2.000E-01	---	RUNOFF
R013	Watershed area for nearby stream or pond (m**2)	1.000E+06	1.000E+06	---	WAREA
R013	Accuracy for water/soil computations	1.000E-06	1.000E-03	---	EPS
R014	Density of saturated zone (g/cm**3)	1.600E+00	1.600E+00	---	DENSAQ
R014	Saturated zone total porosity	4.000E-01	4.000E-01	---	TPSZ
R014	Saturated zone effective porosity	2.000E-01	2.000E-01	---	EPSZ
R014	Saturated zone hydraulic conductivity (m/yr)	1.000E+03	1.000E+02	---	HCSZ
R014	Saturated zone hydraulic gradient	2.000E-02	2.000E-02	---	HGWT
R014	Saturated zone b parameter	5.300E+00	5.300E+00	---	BSZ
R014	Water table drop rate (m/yr)	1.000E-03	1.000E-03	---	VWT
R014	Well pump intake depth (m below water table)	5.000E+00	1.000E+01	---	DWIBWT
R014	Model: Nondispersion (ND) or Mass-Balance (MB)	ND	ND	---	MODEL
R014	Individual's use of groundwater (m**3/yr)	not used	1.500E+02	---	UW
R015	Number of unsaturated zone strata	1	1	---	NS

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R015	Unsat. zone 1, thickness (m)	1.100E+01	4.000E+00	---	H(1)
R015	Unsat. zone 1, soil density (g/cm**3)	1.800E+00	1.600E+00	---	DENSUZ(1)
R015	Unsat. zone 1, total porosity	4.000E-01	4.000E-01	---	TPUZ(1)
R015	Unsat. zone 1, effective porosity	2.000E-01	2.000E-01	---	EPUZ(1)
R015	Unsat. zone 1, soil-specific b parameter	5.300E+00	5.300E+00	---	BUZ(1)
R015	Unsat. zone 1, hydraulic conductivity (m/yr)	1.000E+02	1.000E+02	---	HCUZ(1)
R016	Distribution coefficients for H-3				
R016	Contaminated zone (cm**3/g)	0.000E+00	0.000E+00	---	DCACTC(1)
R016	Unsaturated zone 1 (cm**3/g)	0.000E+00	0.000E+00	---	DCACTU(1,1)
R016	Saturated zone (cm**3/g)	0.000E+00	0.000E+00	---	DCACTS(1)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.319E-02	RLEACH(1)
R016	Distribution coefficients for Th-232				
R016	Contaminated zone (cm**3/g)	6.000E+04	6.000E+04	---	DCACTC(4)
R016	Unsaturated zone 1 (cm**3/g)	6.000E+04	6.000E+04	---	DCACTU(4,1)
R016	Saturated zone (cm**3/g)	6.000E+04	6.000E+04	---	DCACTS(4)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	9.007E-08	RLEACH(4)
R016	Distribution coefficients for daughter Ra-228				
R016	Contaminated zone (cm**3/g)	7.000E+01	7.000E+01	---	DCACTC(2)
R016	Unsaturated zone 1 (cm**3/g)	7.000E+01	7.000E+01	---	DCACTU(2,1)
R016	Saturated zone (cm**3/g)	7.000E+01	7.000E+01	---	DCACTS(2)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	7.703E-05	RLEACH(2)
R016	Distribution coefficients for daughter Th-228				
R016	Contaminated zone (cm**3/g)	6.000E+04	6.000E+04	---	DCACTC(3)
R016	Unsaturated zone 1 (cm**3/g)	6.000E+04	6.000E+04	---	DCACTU(3,1)
R016	Saturated zone (cm**3/g)	6.000E+04	6.000E+04	---	DCACTS(3)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	9.007E-08	RLEACH(3)
R017	Inhalation rate (m**3/yr)	8.400E+03	8.400E+03	---	INHALR
R017	Mass loading for inhalation (g/m**3)	2.000E-04	2.000E-04	---	MLINH
R017	Dilution length for airborne dust, inhalation (m)	3.000E+00	3.000E+00	---	LM
R017	Exposure duration	3.000E+01	3.000E+01	---	ED
R017	Shielding factor, inhalation	4.000E-01	4.000E-01	---	SHF3
R017	Shielding factor, external gamma	7.000E-01	7.000E-01	---	SHF1
R017	Fraction of time spent indoors	5.000E-01	5.000E-01	---	FIND
R017	Fraction of time spent outdoors (on site)	2.500E-01	2.500E-01	---	FOTD
R017	Shape factor, external gamma	1.000E+00	1.000E+00	---	FS1

Site-Specific Parameter Summary (continued)

0 Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R017	Fractions of annular areas within AREA:				
R017	Outer annular radius (m) = √(1/π)	not used	1.000E+00	---	FRACA(1)
R017	Outer annular radius (m) = √(10/π)	not used	1.000E+00	---	FRACA(2)
R017	Outer annular radius (m) = √(20/π)	not used	1.000E+00	---	FRACA(3)
R017	Outer annular radius (m) = √(50/π)	not used	1.000E+00	---	FRACA(4)
R017	Outer annular radius (m) = √(100/π)	not used	1.000E+00	---	FRACA(5)
R017	Outer annular radius (m) = √(200/π)	not used	1.000E+00	---	FRACA(6)
R017	Outer annular radius (m) = √(500/π)	not used	1.000E+00	---	FRACA(7)
R017	Outer annular radius (m) = √(1000/π)	not used	1.000E+00	---	FRACA(8)
R017	Outer annular radius (m) = √(5000/π)	not used	1.000E+00	---	FRACA(9)
R017	Outer annular radius (m) = √(1.E+04/π)	not used	1.000E+00	---	FRACA(10)
R017	Outer annular radius (m) = √(1.E+05/π)	not used	0.000E+00	---	FRACA(11)
R017	Outer annular radius (m) = √(1.E+06/π)	not used	0.000E+00	---	FRACA(12)
R018	Fruits, vegetables and grain consumption (kg/yr)	1.600E+02	1.600E+02	---	DIET(1)
R018	Leafy vegetable consumption (kg/yr)	1.400E+01	1.400E+01	---	DIET(2)
R018	Milk consumption (L/yr)	9.200E+01	9.200E+01	---	DIET(3)
R018	Meat and poultry consumption (kg/yr)	6.300E+01	6.300E+01	---	DIET(4)
R018	Fish consumption (kg/yr)	5.400E+00	5.400E+00	---	DIET(5)
R018	Other seafood consumption (kg/yr)	0.000E+00	9.000E-01	---	DIET(6)
R018	Soil ingestion rate (g/yr)	3.650E+01	3.650E+01	---	SOIL
R018	Drinking water intake (L/yr)	not used	5.100E+02	---	DWI
R018	Fraction of drinking water from site	not used	1.000E+00	---	FDW
R018	Fraction of aquatic food from site	0.000E+00	5.000E-01	---	FR9
R019	Livestock fodder intake for meat (kg/day)	6.800E+01	6.800E+01	---	LFI5
R019	Livestock fodder intake for milk (kg/day)	5.500E+01	5.500E+01	---	LFI6
R019	Livestock water intake for meat (L/day)	5.000E+01	5.000E+01	---	LWI5
R019	Livestock water intake for milk (L/day)	1.600E+02	1.600E+02	---	LWI6
R019	Mass loading for foliar deposition (g/m**3)	1.000E-04	1.000E-04	---	MLFD
R019	Depth of soil mixing layer (m)	1.500E-01	1.500E-01	---	DM
R019	Depth of roots (m)	9.000E-01	9.000E-01	---	DROOT
R019	Drinking water fraction from ground water	not used	1.000E+00	---	FGWDW
R019	Livestock water fraction from ground water	9.000E-01	1.000E+00	---	FGWLW
R019	Irrigation fraction from ground water	1.000E+00	1.000E+00	---	FGWIR
R021	Thickness of building foundation (m)	not used	1.500E-01	---	FLOOR
R021	Bulk density of building foundation (g/cm**3)	not used	2.400E+00	---	DENSFL
R021	Total porosity of the cover material	not used	4.000E-01	---	TPCV
R021	Total porosity of the building foundation	not used	1.000E-01	---	TPFL
R021	Volumetric water content of the cover material	not used	1.000E-01	---	PH2OCV
R021	Volumetric water content of the foundation	not used	5.000E-02	---	PH2OFL
R021	Diffusion coefficient for radon gas (m/sec):				
R021	in cover material	not used	2.000E-06	---	DIFCV
R021	in foundation material	not used	2.000E-08	---	DIFFL
R021	in contaminated zone soil	not used	2.000E-06	---	DIFCZ
R021	Radon vertical dimension of mixing (m)	not used	2.000E+00	---	HMIX
R021	Average annual wind speed (m/sec)	not used	2.000E+00	---	WIND
R021	Average building air exchange rate (1/hr)	not used	1.000E+00	---	REXG
R021	Height of the building (room) (m)	not used	2.500E+00	---	HRM
R021	Building interior area factor	not used	0.000E+00	---	FAI

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R021	Building depth below ground surface (m)	not used	1.000E+00	---	DMFL
R021	Emanating power of Rn-222 gas	not used	2.000E-01	---	EMANA(1)
R021	Emanating power of Rn-220 gas	not used	1.000E-01	---	EMANA(2)

Summary of Pathway Selections

Pathway	User Selection
1 -- external gamma	active
2 -- inhalation	active
3 -- plant ingestion	active
4 -- meat ingestion	active
5 -- milk ingestion	active
6 -- aquatic foods	active
7 -- drinking water	suppressed
8 -- soil ingestion	active
9 -- radon	suppressed

Summary : LEHR Residual Soil Contamination - SW Chemical Area
File : LEHR-SWC.DAT

Contaminated Zone Dimensions		Initial Soil Concentrations, pCi/g	
Area:	250.00 square meters	H-3	4.500E+00
Thickness:	15.00 meters	Th-232	5.000E-02
Cover Depth:	1.00 meters		

Total Dose TDOSE(t), mrem/yr
Basic Radiation Dose Limit = 100 mrem/yr
Total Mixture Sum M(t) = Fraction of Basic Dose Limit Received at Time (t)

t (years):	0.000E+00	1.000E-01	2.000E-01	3.000E-01	4.000E-01	5.000E-01	7.500E-01	1.000E+00	2.000E+00	5.000E+00
TDOSE(t):	4.314E-18	4.460E-08	1.136E-07	2.059E-07	3.205E-07	4.562E-07	8.819E-07	1.419E-06	4.441E-06	1.742E-05
M(t):	4.314E-20	4.460E-10	1.136E-09	2.059E-09	3.205E-09	4.562E-09	8.819E-09	1.419E-08	4.441E-08	1.742E-07

Maximum TDOSE(t): 1.742E-05 mrem/yr at t = 5.000E+00 years

Dose Conversion Factor (and Related) Parameter Summary

0 Menu	Parameter	Current Value	Default	Parameter Name
A-1	Ground external gamma, volume DCF's, (mrem/yr)/(pCi/cm**3):			
A-1	H-3 , soil density = 1.0 g/cm**3	0.000E+00	0.000E+00	DCF1(1,1)
A-1	H-3 , soil density = 1.8 g/cm**3	0.000E+00	0.000E+00	DCF1(1,2)
A-1				
A-1	Sr-90+D , soil density = 1.0 g/cm**3	0.000E+00	0.000E+00	DCF1(2,1)
A-1	Sr-90+D , soil density = 1.8 g/cm**3	0.000E+00	0.000E+00	DCF1(2,2)
A-3	Depth factors, ground external gamma, dimensionless:			
A-3	H-3 , soil density = 1.0 g/cm**3, thickness = .15 m	1.000E+00	1.000E+00	FD(1,1,1)
A-3	H-3 , soil density = 1.0 g/cm**3, thickness = 0.5 m	1.000E+00	1.000E+00	FD(1,2,1)
A-3	H-3 , soil density = 1.0 g/cm**3, thickness = 1.0 m	1.000E+00	1.000E+00	FD(1,3,1)
A-3	H-3 , soil density = 1.8 g/cm**3, thickness = .15 m	1.000E+00	1.000E+00	FD(1,1,2)
A-3	H-3 , soil density = 1.8 g/cm**3, thickness = 0.5 m	1.000E+00	1.000E+00	FD(1,2,2)
A-3	H-3 , soil density = 1.8 g/cm**3, thickness = 1.0 m	1.000E+00	1.000E+00	FD(1,3,2)
A-3				
A-3	Sr-90+D , soil density = 1.0 g/cm**3, thickness = .15 m	8.100E-01	8.100E-01	FD(2,1,1)
A-3	Sr-90+D , soil density = 1.0 g/cm**3, thickness = 0.5 m	9.800E-01	9.800E-01	FD(2,2,1)
A-3	Sr-90+D , soil density = 1.0 g/cm**3, thickness = 1.0 m	1.000E+00	1.000E+00	FD(2,3,1)
A-3	Sr-90+D , soil density = 1.8 g/cm**3, thickness = .15 m	9.000E-01	9.000E-01	FD(2,1,2)
A-3	Sr-90+D , soil density = 1.8 g/cm**3, thickness = 0.5 m	1.000E+00	1.000E+00	FD(2,2,2)
A-3	Sr-90+D , soil density = 1.8 g/cm**3, thickness = 1.0 m	1.000E+00	1.000E+00	FD(2,3,2)
B-1	Dose conversion factors for dust inhalation, mrem/pCi:			
B-1	H-3	6.300E-08	6.300E-08	DCF2(1)
B-1	Sr-90+D	1.300E-03	1.300E-03	DCF2(2)
D-1	Dose conversion factors for ingestion, mrem/pCi:			
D-1	H-3	6.300E-08	6.300E-08	DCF3(1)
D-1	Sr-90+D	1.400E-04	1.400E-04	DCF3(2)
D-34	Food transfer factors:			
D-34	H-3 , plant/soil concentration ratio, dimensionless	0.000E+00	0.000E+00	RTF(1,1)
D-34	H-3 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	0.000E+00	0.000E+00	RTF(1,2)
D-34	H-3 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	0.000E+00	0.000E+00	RTF(1,3)
D-34				
D-34	Sr-90+D , plant/soil concentration ratio, dimensionless	2.000E-01	2.000E-01	RTF(2,1)
D-34	Sr-90+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.000E-04	3.000E-04	RTF(2,2)
D-34	Sr-90+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.500E-03	1.500E-03	RTF(2,3)
D-5	Bioaccumulation factors, fresh water, L/kg:			
D-5	H-3 , fish	9.000E-01	9.000E-01	BIOFAC(1,1)
D-5	H-3 , crustacea and mollusks	9.000E-01	9.000E-01	BIOFAC(1,2)
D-5				
D-5	Sr-90+D , fish	3.000E+01	3.000E+01	BIOFAC(2,1)
D-5	Sr-90+D , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(2,2)

Site-Specific Parameter Summary

0 Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R011	Area of contaminated zone (m**2)	9.500E+03	1.000E+04	---	AREA
R011	Thickness of contaminated zone (m)	2.000E+01	1.000E+00	---	THICKO
R011	Length parallel to aquifer flow (m)	1.000E+02	1.000E+02	---	LCZPAQ
R011	Basic radiation dose limit (mrem/yr)	1.000E+02	1.000E+02	---	BRLD
R011	Time since placement of material (yr)	5.000E+00	0.000E+00	---	TI
R011	Times for calculations (yr)	1.000E-01	1.000E+00	---	T(2)
R011	Times for calculations (yr)	2.000E-01	3.000E+00	---	T(3)
R011	Times for calculations (yr)	3.000E-01	1.000E+01	---	T(4)
R011	Times for calculations (yr)	4.000E-01	3.000E+01	---	T(5)
R011	Times for calculations (yr)	5.000E-01	1.000E+02	---	T(6)
R011	Times for calculations (yr)	7.500E-01	3.000E+02	---	T(7)
R011	Times for calculations (yr)	1.000E+00	1.000E+03	---	T(8)
R011	Times for calculations (yr)	2.000E+00	3.000E+03	---	T(9)
R011	Times for calculations (yr)	5.000E+00	1.000E+04	---	T(10)
R012	Initial principal radionuclide (pCi/g): H-3	1.000E+00	0.000E+00	---	S(1)
R012	Initial principal radionuclide (pCi/g): Sr-90	1.100E-01	0.000E+00	---	S(2)
R012	Concentration in groundwater (pCi/L): H-3	not used	0.000E+00	---	W(1)
R012	Concentration in groundwater (pCi/L): Sr-90	not used	0.000E+00	---	W(2)
R013	Cover depth (m)	1.000E+00	0.000E+00	---	COVERO
R013	Density of cover material (g/cm**3)	1.600E+00	1.600E+00	---	DENSCV
R013	Cover depth erosion rate (m/yr)	1.000E-03	1.000E-03	---	VCV
R013	Density of contaminated zone (g/cm**3)	1.800E+00	1.600E+00	---	DENSCZ
R013	Contaminated zone erosion rate (m/yr)	1.000E-03	1.000E-03	---	VCZ
R013	Contaminated zone total porosity	4.000E-01	4.000E-01	---	TPCZ
R013	Contaminated zone effective porosity	2.000E-01	2.000E-01	---	EPCZ
R013	Contaminated zone hydraulic conductivity (m/yr)	1.000E+01	1.000E+01	---	HCCZ
R013	Contaminated zone b parameter	5.300E+00	5.300E+00	---	BCZ
R013	Humidity in air (g/cm**3)	8.000E+00	8.000E+00	---	HUMID
R013	Evapotranspiration coefficient	6.000E-01	6.000E-01	---	EVAPTR
R013	Precipitation (m/yr)	4.560E-01	1.000E+00	---	PRECIP
R013	Irrigation (m/yr)	0.000E+00	2.000E-01	---	RI
R013	Irrigation mode	overhead	overhead	---	IDITCH
R013	Runoff coefficient	2.000E-01	2.000E-01	---	RUNOFF
R013	Watershed area for nearby stream or pond (m**2)	1.000E+06	1.000E+06	---	WAREA
R013	Accuracy for water/soil computations	1.000E-06	1.000E-03	---	EPS
R014	Density of saturated zone (g/cm**3)	1.600E+00	1.600E+00	---	DENSAQ
R014	Saturated zone total porosity	4.000E-01	4.000E-01	---	TPSZ
R014	Saturated zone effective porosity	2.000E-01	2.000E-01	---	EPSZ
R014	Saturated zone hydraulic conductivity (m/yr)	1.000E+03	1.000E+02	---	HCSZ
R014	Saturated zone hydraulic gradient	2.000E-02	2.000E-02	---	HGWT
R014	Saturated zone b parameter	5.300E+00	5.300E+00	---	BSZ
R014	Water table drop rate (m/yr)	1.000E-03	1.000E-03	---	VWT
R014	Well pump intake depth (m below water table)	5.000E+00	1.000E+01	---	DWIBWT
R014	Model: Nondispersion (ND) or Mass-Balance (MB)	ND	ND	---	MODEL
R014	Individual's use of groundwater (m**3/yr)	not used	1.500E+02	---	UW
R015	Number of unsaturated zone strata	1	1	---	NS

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R015	Unsat. zone 1, thickness (m)	1.100E+01	4.000E+00	---	H(1)
R015	Unsat. zone 1, soil density (g/cm**3)	1.800E+00	1.600E+00	---	DENSUZ(1)
R015	Unsat. zone 1, total porosity	4.000E-01	4.000E-01	---	TPUZ(1)
R015	Unsat. zone 1, effective porosity	2.000E-01	2.000E-01	---	EPUZ(1)
R015	Unsat. zone 1, soil-specific b parameter	5.300E+00	5.300E+00	---	BUZ(1)
R015	Unsat. zone 1, hydraulic conductivity (m/yr)	1.000E+02	1.000E+02	---	HCUZ(1)
R016	Distribution coefficients for H-3				
R016	Contaminated zone (cm**3/g)	0.000E+00	0.000E+00	---	DCACTC(1)
R016	Unsaturated zone 1 (cm**3/g)	0.000E+00	0.000E+00	---	DCACTU(1,1)
R016	Saturated zone (cm**3/g)	0.000E+00	0.000E+00	---	DCACTS(1)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.489E-02	RLEACH(1)
R016	Distribution coefficients for Sr-90				
R016	Contaminated zone (cm**3/g)	3.000E+01	3.000E+01	---	DCACTC(2)
R016	Unsaturated zone 1 (cm**3/g)	3.000E+01	3.000E+01	---	DCACTU(2,1)
R016	Saturated zone (cm**3/g)	3.000E+01	3.000E+01	---	DCACTS(2)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.344E-04	RLEACH(2)
R017	Inhalation rate (m**3/yr)	8.400E+03	8.400E+03	---	INHALR
R017	Mass loading for inhalation (g/m**3)	2.000E-04	2.000E-04	---	MLINH
R017	Dilution length for airborne dust, inhalation (m)	3.000E+00	3.000E+00	---	LM
R017	Exposure duration	3.000E+01	3.000E+01	---	ED
R017	Shielding factor, inhalation	4.000E-01	4.000E-01	---	SHF3
R017	Shielding factor, external gamma	7.000E-01	7.000E-01	---	SHF1
R017	Fraction of time spent indoors	5.000E-01	5.000E-01	---	FIND
R017	Fraction of time spent outdoors (on site)	2.500E-01	2.500E-01	---	FOTD
R017	Shape factor, external gamma	1.000E+00	1.000E+00	---	FS1
R017	Fractions of annular areas within AREA:				
R017	Outer annular radius (m) = $\sqrt{(1/\pi)}$	not used	1.000E+00	---	FRACA(1)
R017	Outer annular radius (m) = $\sqrt{(10/\pi)}$	not used	1.000E+00	---	FRACA(2)
R017	Outer annular radius (m) = $\sqrt{(20/\pi)}$	not used	1.000E+00	---	FRACA(3)
R017	Outer annular radius (m) = $\sqrt{(50/\pi)}$	not used	1.000E+00	---	FRACA(4)
R017	Outer annular radius (m) = $\sqrt{(100/\pi)}$	not used	1.000E+00	---	FRACA(5)
R017	Outer annular radius (m) = $\sqrt{(200/\pi)}$	not used	1.000E+00	---	FRACA(6)
R017	Outer annular radius (m) = $\sqrt{(500/\pi)}$	not used	1.000E+00	---	FRACA(7)
R017	Outer annular radius (m) = $\sqrt{(1000/\pi)}$	not used	1.000E+00	---	FRACA(8)
R017	Outer annular radius (m) = $\sqrt{(5000/\pi)}$	not used	1.000E+00	---	FRACA(9)
R017	Outer annular radius (m) = $\sqrt{(1.E+04/\pi)}$	not used	1.000E+00	---	FRACA(10)
R017	Outer annular radius (m) = $\sqrt{(1.E+05/\pi)}$	not used	0.000E+00	---	FRACA(11)
R017	Outer annular radius (m) = $\sqrt{(1.E+06/\pi)}$	not used	0.000E+00	---	FRACA(12)
R018	Fruits, vegetables and grain consumption (kg/yr)	1.600E+02	1.600E+02	---	DIET(1)
R018	Leafy vegetable consumption (kg/yr)	1.400E+01	1.400E+01	---	DIET(2)
R018	Milk consumption (L/yr)	9.200E+01	9.200E+01	---	DIET(3)
R018	Meat and poultry consumption (kg/yr)	6.300E+01	6.300E+01	---	DIET(4)
R018	Fish consumption (kg/yr)	5.400E+00	5.400E+00	---	DIET(5)
R018	Other seafood consumption (kg/yr)	9.000E-01	9.000E-01	---	DIET(6)
R018	Soil ingestion rate (g/yr)	3.650E+01	3.650E+01	---	SOIL
R018	Drinking water intake (L/yr)	not used	5.100E+02	---	DWI
R018	Fraction of drinking water from site	not used	1.000E+00	---	FDW

Site-Specific Parameter Summary (continued)

0 Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R018	Fraction of aquatic food from site	0.000E+00	5.000E-01	---	FR9
R019	Livestock fodder intake for meat (kg/day)	6.800E+01	6.800E+01	---	LFI5
R019	Livestock fodder intake for milk (kg/day)	5.500E+01	5.500E+01	---	LFI6
R019	Livestock water intake for meat (L/day)	5.000E+01	5.000E+01	---	LWI5
R019	Livestock water intake for milk (L/day)	1.600E+02	1.600E+02	---	LWI6
R019	Mass loading for foliar deposition (g/m**3)	1.000E-04	1.000E-04	---	MLFD
R019	Depth of soil mixing layer (m)	1.500E-01	1.500E-01	---	DM
R019	Depth of roots (m)	9.000E-01	9.000E-01	---	DROOT
R019	Drinking water fraction from ground water	not used	1.000E+00	---	FGWDW
R019	Livestock water fraction from ground water	9.500E-01	1.000E+00	---	FGWLW
R019	Irrigation fraction from ground water	1.000E+00	1.000E+00	---	FGWIR
R021	Thickness of building foundation (m)	not used	1.500E-01	---	FLOOR
R021	Bulk density of building foundation (g/cm**3)	not used	2.400E+00	---	DENSFL
R021	Total porosity of the cover material	not used	4.000E-01	---	TPCV
R021	Total porosity of the building foundation	not used	1.000E-01	---	TPFL
R021	Volumetric water content of the cover material	not used	1.000E-01	---	PH2OCV
R021	Volumetric water content of the foundation	not used	5.000E-02	---	PH2OFL
R021	Diffusion coefficient for radon gas (m/sec):				
R021	in cover material	not used	2.000E-06	---	DIFCV
R021	in foundation material	not used	2.000E-08	---	DIFFL
R021	in contaminated zone soil	not used	2.000E-06	---	DIFCZ
R021	Radon vertical dimension of mixing (m)	not used	2.000E+00	---	HMIX
R021	Average annual wind speed (m/sec)	not used	2.000E+00	---	WIND
R021	Average building air exchange rate (1/hr)	not used	1.000E+00	---	REXG
R021	Height of the building (room) (m)	not used	2.500E+00	---	HRM
R021	Building interior area factor	not used	0.000E+00	---	FAI
R021	Building depth below ground surface (m)	not used	1.000E+00	---	DMFL
R021	Emanating power of Rn-222 gas	not used	2.000E-01	---	EMANA(1)
R021	Emanating power of Rn-220 gas	not used	1.000E-01	---	EMANA(2)

Summary of Pathway Selections

Pathway	User Selection
1 -- external gamma	active
2 -- inhalation	active
3 -- plant ingestion	active
4 -- meat ingestion	active
5 -- milk ingestion	active
6 -- aquatic foods	active
7 -- drinking water	suppressed
8 -- soil ingestion	active
9 -- radon	suppressed

Contaminated Zone Dimensions		Initial Soil Concentrations, pCi/g	
Area:	9500.00 square meters	H-3	1.000E+00
Thickness:	20.00 meters	Sr-90	1.100E-01
Cover Depth:	1.00 meters		

Total Dose TDOSE(t), mrem/yr
Basic Radiation Dose Limit = 100 mrem/yr
Total Mixture Sum M(t) = Fraction of Basic Dose Limit Received at Time (t)

t (years):	0.000E+00	1.000E-01	2.000E-01	3.000E-01	4.000E-01	5.000E-01	7.500E-01	1.000E+00	2.000E+00	5.000E+00
TDOSE(t):	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
M(t):	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Maximum TDOSE(t): 0.000E+00 mrem/yr at t = 5.000E+00 years

CAP-88 FOR CEDE

Including Imhoff, Co-60, and Diffuse Sources

C A P 8 8 - P C

Version 1.00

Clean Air Act Assessment Package - 1988

S Y N O P S I S R E P O R T

Non-Radon Population Assessment
Jun 7, 1996 5:24 pm

Facility: Co-60 Building
Address: UC Davis
City: Davis
State: CA Zip:

Effective Dose Equivalent (mrem/year)
4.81E-03

At This Location: 250 Meters North
Source Category: elevated release with filtration
Source Type: Stack
Emission Year: 95

Comments: Estimated dose from future D&D of Co-60 building

Dataset Name: ucdpopall
Dataset Date: Jun 7, 1996 5:23 pm
Wind File: WNDFILES\SAC0320.WND
Population File: POPFILES\UCDAVIS.POP

MAXIMALLY EXPOSED INDIVIDUAL

Location Of The Individual: 250 Meters North
Lifetime Fatal Cancer Risk: 8.10E-08

ORGAN DOSE EQUIVALENT SUMMARY

Organ	Selected Individual (mrem/y)	Collective Population (person-rem/y)
GONADS	1.99E-04	1.28E-03
BREAST	1.99E-04	1.28E-03
R MAR	2.40E-02	1.54E-01
LUNGS	2.08E-04	1.33E-03
THYROID	1.99E-04	1.28E-03
ENDOST	5.32E-02	3.41E-01
RMNDR	7.36E-04	4.75E-03
EFFEC	4.81E-03	3.09E-02

FREQUENCY DISTRIBUTION OF LIFETIME FATAL CANCER RISKS

Risk Range	Number of People	Number of People In This Risk Range Or Higher	Deaths/Year In This Risk Range	Deaths/Year In This Risk Range Or Higher
1.0E+00 TO 1.0E-01	0	0	0.00E+00	0.00E+00
1.0E-01 TO 1.0E-02	0	0	0.00E+00	0.00E+00
1.0E-02 TO 1.0E-03	0	0	0.00E+00	0.00E+00
1.0E-03 TO 1.0E-04	0	0	0.00E+00	0.00E+00
1.0E-04 TO 1.0E-05	0	0	0.00E+00	0.00E+00
1.0E-05 TO 1.0E-06	0	0	0.00E+00	0.00E+00
LESS THAN 1.0E-06	104317	104317	7.35E-06	7.35E-06

RADIONUCLIDE EMISSIONS DURING THE YEAR 95

Nuclide	Class	Size	Source #1 Ci/y	TOTAL Ci/y
AM-241	W	1.00	1.0E-10	1.0E-10
H-3	*	0.00	6.7E-04	6.7E-04
NP-237	W	1.00	1.0E-10	1.0E-10
PU-239	Y	1.00	1.0E-10	1.0E-10
SR-90	D	1.00	2.8E-04	2.8E-04
Y-90	Y	1.00	1.0E-10	1.0E-10
RA-226	W	1.00	1.0E-10	1.0E-10

SITE INFORMATION

Temperature: 20 degrees C
Precipitation: 45 cm/y
Mixing Height: 1000 m

SOURCE INFORMATION

Source Number: 1

Stack Height (m): 5.40
Diameter (m): 0.31

Plume Rise
Momentum (m/s): 9.65E+00
(Exit Velocity)

AGRICULTURAL DATA

	Vegetable	Milk	Meat
Fraction Home Produced:	0.700	0.399	0.442
Fraction From Assessment Area:	0.300	0.601	0.558
Fraction Imported:	0.000	0.000	0.000

Beef Cattle Density: 8.81E-02
Milk Cattle Density: 2.85E-02
Land Fraction Cultivated
for Vegetable Crops: 2.50E-01

POPULATION DATA

	Distance (m)						
Direction	250	750	1500	2500	3500	4500	6523
N	400	4000	2000	2000	3515	1042	4100
NNW	400	400	2000	4000	2314	2058	268
NW	400	400	2000	2000	2000	5615	2195
WNW	400	400	2000	2000	2000	4000	312
W	400	100	10	10	10	10	10
WSW	0	0	5	5	5	5	1
SW	0	0	2	2	2	2	2
SSW	0	0	2	2	2	2	2
S	0	0	2	2	2	2	1
SSE	0	0	2	2	2	2	0
SE	0	0	2	2	2	2	1
ESE	0	0	2	2	2	2	2
E	0	0	0	200	200	1527	1900
ENE	105	105	500	1200	1300	4100	13980
NE	400	300	100	1155	7208	3817	300
NNE	400	400	2788	2800	2778	10	12

	Distance (m)
Direction	9023
N	1000
NNW	100
NW	75
WNW	100
W	50
WSW	0
SW	0
SSW	0
S	0
SSE	2
SE	2
ESE	2
E	1
ENE	402
NE	150
NNE	2

C A P 8 8 - P C

Version 1.00

Clean Air Act Assessment Package - 1988

S Y N O P S I S R E P O R T

Non-Radon Population Assessment
Jun 7, 1996 5:30 pm

Facility: IMHOFF Building
Address: UC Davis
City: Davis
State: CA Zip:

Effective Dose Equivalent (mrem/year)
7.09E-05

At This Location: 250 Meters North
Source Category: elevated release with filtration
Source Type: Stack
Emission Year: 95

Comments: Estimated dose from IMHOFF building CY 95. Source adjusted for DF 1000 and 1/3 of CY 94 inventory.

Dataset Name: ucdpopimhof
Dataset Date: Jun 7, 1996 5:29 pm
Wind File: WNDFILES\SAC0320.WND
Population File: POPFILES\UCDAVIS.POP

MAXIMALLY EXPOSED INDIVIDUAL

Location Of The Individual: 250 Meters North
Lifetime Fatal Cancer Risk: 1.10E-09

ORGAN DOSE EQUIVALENT SUMMARY

Organ	Selected Individual (mrem/y)	Collective Population (person-rem/y)
GONADS	8.18E-06	3.18E-05
BREAST	8.21E-06	3.19E-05
R MAR	1.70E-04	6.71E-04
LUNGS	1.74E-04	6.42E-04
THYROID	8.15E-06	3.17E-05
ENDOST	7.45E-04	2.92E-03
RMNDR	1.26E-05	4.94E-05
EFFEC	7.09E-05	2.74E-04

FREQUENCY DISTRIBUTION OF LIFETIME FATAL CANCER RISKS

Risk Range	Number of People	Number of People In This Risk Range Or Higher	Deaths/Year In This Risk Range	Deaths/Year In This Risk Range Or Higher
1.0E+00 TO 1.0E-01	0	0	0.00E+00	0.00E+00
1.0E-01 TO 1.0E-02	0	0	0.00E+00	0.00E+00
1.0E-02 TO 1.0E-03	0	0	0.00E+00	0.00E+00
1.0E-03 TO 1.0E-04	0	0	0.00E+00	0.00E+00
1.0E-04 TO 1.0E-05	0	0	0.00E+00	0.00E+00
1.0E-05 TO 1.0E-06	0	0	0.00E+00	0.00E+00
LESS THAN 1.0E-06	104317	104317	5.91E-08	5.91E-08

RADIONUCLIDE EMISSIONS DURING THE YEAR 95

Nuclide	Class	Size	Source #1 Ci/y	TOTAL Ci/y
SR-90	D	1.00	6.6E-07	6.6E-07
Y-90	Y	1.00	6.6E-07	6.6E-07
RA-226	W	1.00	1.7E-07	1.7E-07
H-3	*	0.00	1.0E-07	1.0E-07

SITE INFORMATION

Temperature: 20 degrees C
Precipitation: 45 cm/y
Mixing Height: 1000 m

SOURCE INFORMATION

Source Number: 1

Stack Height (m): 1.00
Diameter (m): 0.31

Plume Rise Momentum (m/s): 1.16E+01
(Exit Velocity)

AGRICULTURAL DATA

	Vegetable	Milk	Meat
Fraction Home Produced:	0.700	0.399	0.442
Fraction From Assessment Area:	0.300	0.601	0.558
Fraction Imported:	0.000	0.000	0.000

Beef Cattle Density: 8.81E-02
Milk Cattle Density: 2.85E-02
Land Fraction Cultivated for Vegetable Crops: 2.50E-01

POPULATION DATA

	Distance (m)						
Direction	250	750	1500	2500	3500	4500	6523
N	400	4000	2000	2000	3515	1042	4100
NNW	400	400	2000	4000	2314	2058	268
NW	400	400	2000	2000	2000	5615	2195
WNW	400	400	2000	2000	2000	4000	312
W	400	100	10	10	10	10	10
WSW	0	0	5	5	5	5	1
SW	0	0	2	2	2	2	2
SSW	0	0	2	2	2	2	2
S	0	0	2	2	2	2	1
SSE	0	0	2	2	2	2	0
SE	0	0	2	2	2	2	1
ESE	0	0	2	2	2	2	2
E	0	0	0	200	200	1527	1900
ENE	105	105	500	1200	1300	4100	13980
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ESE	2
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ENE	402
NE	150
NNE	2