The Boeing Company
Rocketdyne Propulsion & Power
6633 Canoga Avenue
P.O. Box 7922
Canoga Park, CA 91309-7922

June 9, 2000
In reply refer to: 2000RC-2419

BOEING

D. Sutherland
DOE Site Manager
U.S. Department of Energy
Oakland Operations Office
1301 Clay Street
Oakland, CA 94612-5208

Subject: NESHAPs Report for 1999

Dear Ms. Sutherland:

Enclosed is the NESHAPs (National Emission Standards for Hazardous Air Pollutants - Radionuclides) Report for 1999 for the Department of Energy's (DOE) facility at Santa Susana Field Laboratory (SSFL). This report includes the analysis results of the effluent samples from a radiological exhaust stack in operation at a DOE facility during 1999, and estimates of emissions from a diffuse area source. This submittal consists of the Radionuclide Air Emissions Annual Report with attached computer printouts from the CAP88PC calculations for one point source, RMHF stack, and one area source, RMHF pond.

Three area sources, the 4064 Sideyard, the 17th Street Drainage Area, and the Hot Lab 4468 Excavation Area, were included in previous year's reports. These areas were remediated in 1998 and underwent surveys by Rocketdyne, ORISE and the California Department of Health Services (DHS) in 1998 and 1999. All surveys confirmed that these areas are suitable for unrestricted use. Therefore, they are no longer considered radiological sources and are not included in this report. The 4024 portable exhauster, which was included in last year's report, was operated in 1999. However, detailed analysis of the filters indicated no presence of man-made radioactive isotopes, and, therefore, it is not included as a release source for dose assessment.

Because the point source, with HEPA filtration, releases so little radioactivity, and because the soil resuspension model in RESRAD, which is used to calculate the potential airborne releases of the area source, provides a very conservative overestimate of the releases, the area source shows higher estimated doses than the point source.

BOEING

This report includes the Certification Statement to be signed by M. E. Lee (or designee) for The Boeing Company, Rocketdyne and by you for the DOE Site Closure Office. The Certification Statements are required for the final report.

If you have any questions or comments on this report, please contact Ning Liu at (818) 586-6262.

Sincerely,

M. E. Lee, Program Manager
DOE Site Closure

Enclosure: Radionuclide Air Emissions Annual Report

cc: S. Black, DOE/OAK

SHEA-090184

DOEAIR99

U. S. Department of Energy
Radionuclide Air Emissions Annual Report
(under Subpart H of 40 CFR Part 61)
Calendar Year 1999

Site Name: Santa Susana Field Laboratory
(Prepared on May 11, 2000)

Operations Office Information

Office: Oakland Operations Office
Address: 1301 Clay Street Room 700N
Oakland, CA 94612-5208

Contact: Steve Black Phone: (510) 637-1595

Site Information

Operator: The Boeing Company, Rocketdyne
Address: 6633 Canoga Avenue
P. O. Box 7922
Canoga Park, CA 91309-7922

Contact: N. Liu (T038) Phone: (818) 586-6262

Section I. Facility Information

Site Description

The Santa Susana Field Laboratory (SSFL) is located in a mountainous wilderness region between the residential areas of Simi Valley and San Fernando Valley at the boundary of Ventura and Los Angeles Counties in southern California (Figure 1). The site consists of approximately 2,850 acres, but DOE operations are limited to a designated area of about 90 acres (Figure 2). The climate is generally dry, with variable winds.

The facility formerly served as a test site for very low-power experimental nuclear reactors and for developmental fuel fabrication, and fuel decladding. All the nuclear related research and development (R&D) operations in Area IV ceased in 1988, and the subsequent efforts have been directed toward decontamination and decommissioning (D&D) of the former nuclear facilities.

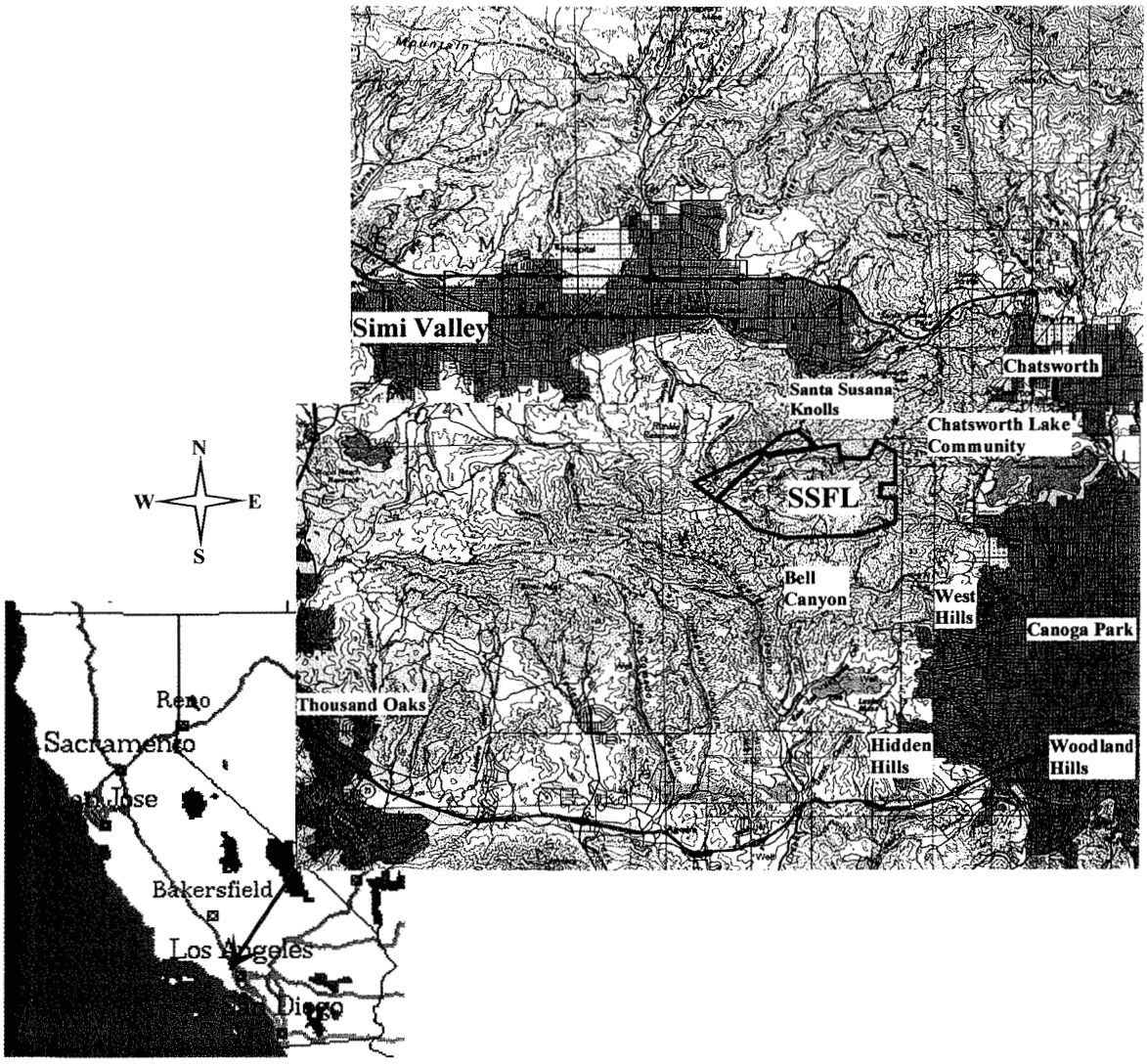

Figure 1. Map Showing Location of SSFL

Subdivisions			
Owner	**Jurisdiction**	**Acres**	**Subtotals**
Rocketdyne	Rocketdyne-Area IV	289.9	
	Rocketdyne	784.8	
	Rocketdyne (Undeveloped land)	1,324.6	2,399.3
Government	NASA (former AFP 57)	409.5	
	NASA (former AFP 64)	41.7	451.2
Total Acres			2,850.5

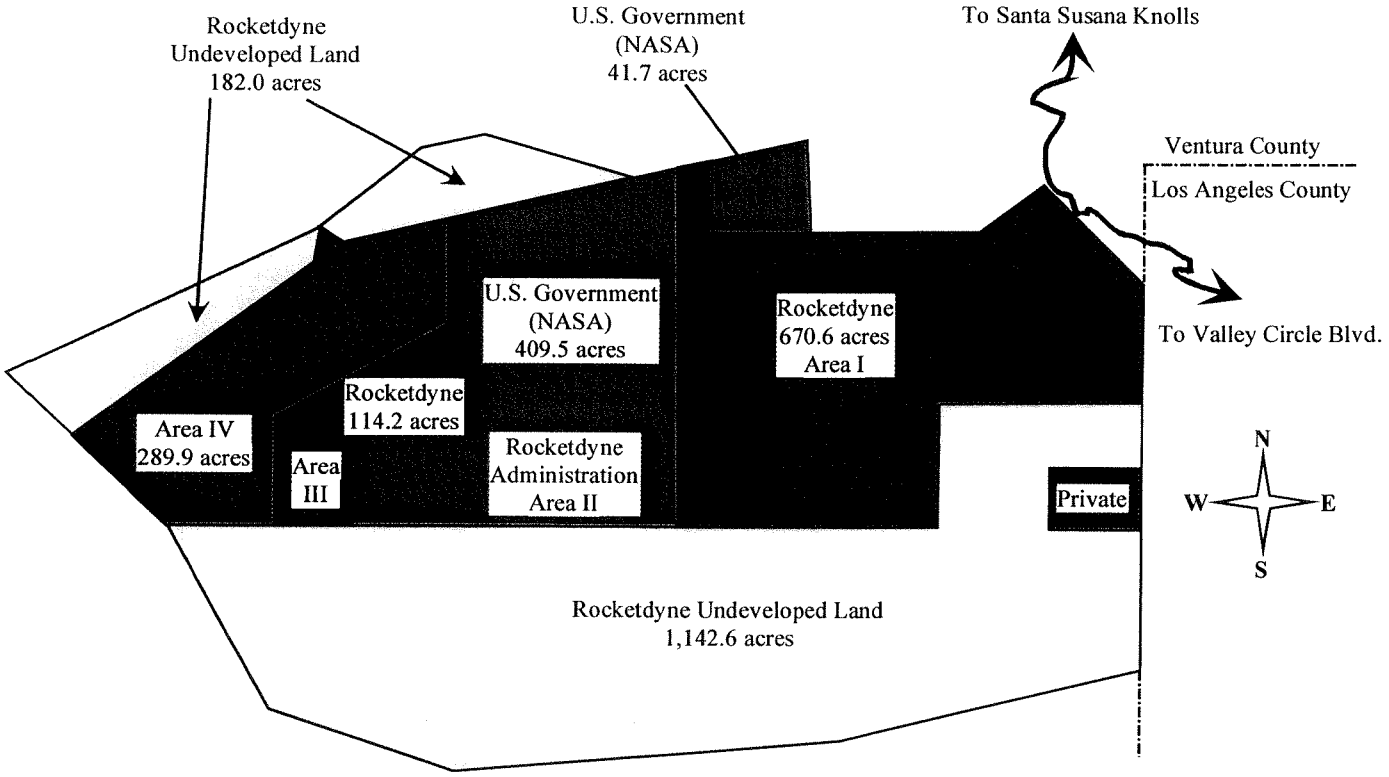

Figure 2-1. Santa Susana Field Laboratory Site Arrangement

Source Description

Potential sources of release of radionuclides at SSFL include both point and area (non-point) sources. The point sources include a facility ventilation exhaust stack and a portable ventilation unit, and the area source is a seasonally dry water retention sump. Figure 3 shows the locations of these sources. Air samples from the ventilation and soil sample from the dry water retention sump were analyzed for specific radionuclides, and the results were used for the dose assessment in this report.

The Radioactive Materials Handling Facility (RMHF) is used for storage of waste packages waiting shipment to a DOE waste disposal site, evaporation of radioactively contaminated water generated in decontamination operations, and decontamination, size-reduction, and packaging in support of the decontamination operations. Ventilation from work areas in this facility is exhausted through HEPA filters and released from a stack. In the NESHAPs report, this release point is identified as Point Source #1.

Building 4024 was used as a staging and decontamination area for the Hot Laboratory concrete blocks, which were extracted from the building during remediation activities. A Sprung portable tent was set up and a portable HEPA ventilation system was used to apply negative pressure inside the tent during block decontamination. This ventilation system exhausted to the outside environment. Detailed analysis of the sample filters indicated no man-made radioactive isotopes, therefore, the ventilation system is not considered a release point in this report.

Building 4059 is a former low-power reactor test facility used in the development of nuclear reactors in the Systems for Nuclear Auxiliary Power (SNAP) program. Remaining activated steel and concrete structural material have been removed during past decommissioning operations. In 1999, no remedial operations were performed and no radioactive materials were discharged from this facility. Therefore, Building 4059 stack is not considered a release point in this report.

The RMHF Pond (Sump 614) is a collection sump for rainfall runoff from the RMHF. When the sump is dry, sediment may be subject to airborne resuspension by wind. During 1999, the sump was dry for approximately 50 days. It is assumed that the RMHF pond be a diffuse area source during the dry period. This source is identified as Area Source # 1.

Three area sources, the 4064 Sideyard, the 17th Street Drainage Area, and the Hot Lab 4468 Excavation Area, were mentioned in previous year's report. These areas were remedied in 1998 and underwent surveys by Rocketdyne, ORISE and the California Department of Health Services (DHS) in 1998 and 1999. All surveys confirmed that these areas are suitable for unrestricted use. Therefore, they are no longer considered radiological sources in this report.

The RMHF North Slope is an identified area of low-level soil contamination. Radioactivity in the soil may become airborne if the soil surface is exposed. However, throughout 1999, the area was covered with dense brush, and no release is assumed. Therefore, in this NESHAPs report, this area is not considered a release point for radioactivity.

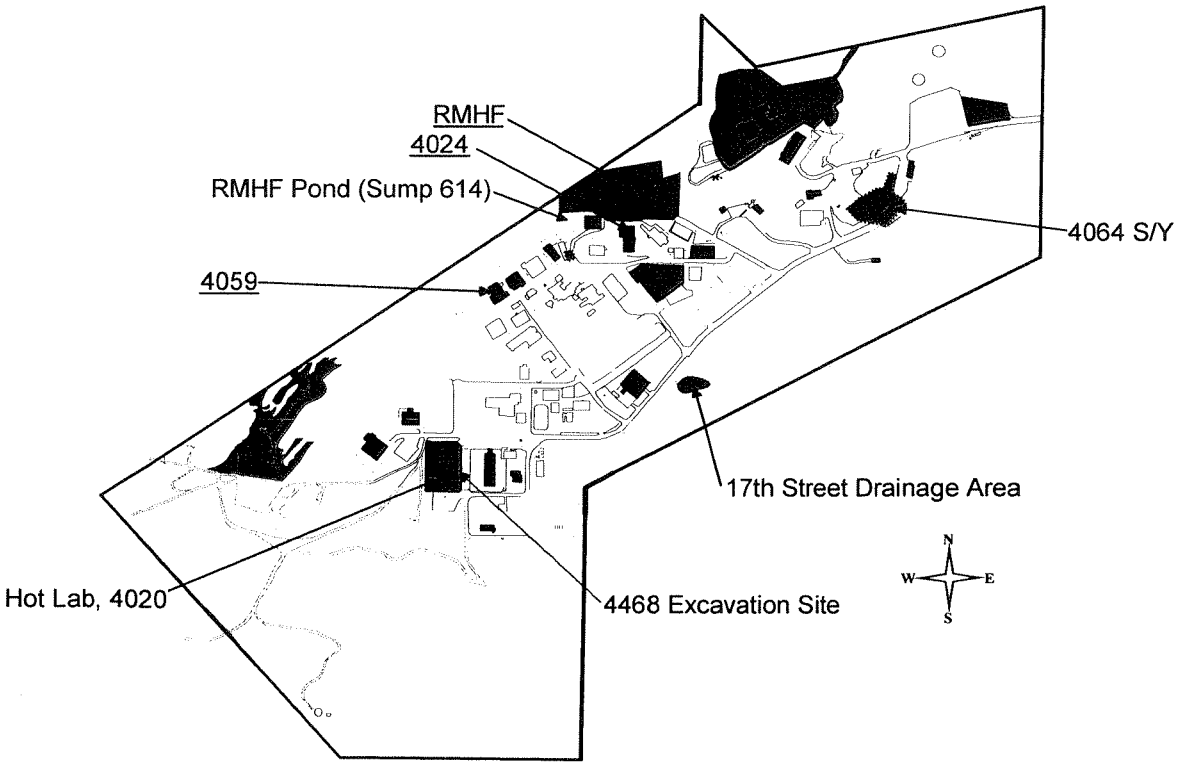

Figure 3. SSFL, Area IV, Source Locations

Section II. Air Emissions Data

Point Source	Type Control	Efficiency	Distance to Nearest Receptor
RMHF (#1)	Pre- and HEPA filters	99.97+%	2320 m SSE

Point Source Radionuclides	Annual Release Quantity (Ci)	(Bq)
H-3	3.8E-06	1.4E+05
Co-60	6.8E-08	2.5E+03
Cs-137	1.5E-07	5.4E+03
Ba-137M (Cs-137 daughter in equilibrium)	1.4E-07	5.1E+03

Area (Non-Point) Source

Sump 614 (#1)

Area (Non-Point) Source Radionuclides	Annual Release Quantity (Ci)	(Bq)
Co-60	3.0E-08	1.1E+03
Cs-137	1.9E-07	7.0E+03
Ba-137M (Cs-137 daughter in equilibrium)	1.8E-07	6.7E+03

Section III. Dose Assessments

Description of Dose Model

Radiation doses to the Maximally Exposed Individual (MEI) as well as the population in the surrounding area resulting from the emissions of the DOE facility at SSFL during 1999 are calculated using the EPA's CAP88-PC computer code. Site specific meteorological data, such as wind speed, direction frequency, and stability, were developed by the NRC and Argonne National Laboratory and used for the atmospheric dispersion calculation in CAP88-PC. Other input data, such as release terms, stack heights, and exhaust air velocity, were physically measured to represent the site specific situation for dose calculations.

Dose calculations performed to demonstrate compliance with the NESHAPs standard are based on determining the maximum estimated dose to an offsite individual located at a residence, school, business, or office. For this purpose, the nearest such locations have been identified by review of maps, aerial photographs, and direct observation. The locations selected are in the nearest residential area of Simi Valley, the Brandeis-Bardin Institute, the Santa Monica Mountains Conservancy Sage Ranch office, the closest residence in Black Canyon, and the closest residence in Bell Canyon. The location with the highest estimated annual dose is considered the location of the Maximally Exposed Individual (MEI).

The RMHF stack is a point emission source. The Effective Dose Equivalent to the MEI resulting from the emission is compared against the NESHAPs standard for the demonstration of compliance. The dose was calculated using CAP88-PC with site-specific input data.

Dose estimate for the area source was also calculated. The CAP88-PC calculation uses conservative estimates for the presumed, but unmeasurable, releases from the area source. The dose resulting from the area source is not applicable for the NESHAPs compliance. It is included here for information purpose.

Compliance Assessment

Location of Maximally Exposed Individual (MEI): Residence in Simi Valley, 2867 m NW of RMHF.

Effective Dose Equivalent to the MEI: 2.2E-07 mrem (2.2E-11 Sv). This estimated dose is well below the NESHAPs standard of 10 mrem (1.0E-04 Sv).

The estimated dose due to the area (non-point) source is 6.6E-07 mrem (6.6E-11 Sv). Although reporting this source is not a regulatory requirement, it is reported for the interest of providing complete information. The estimate is lower compared to those of prior years because the radionuclide concentrations in the sump are lower than those of prior years and there is only one area source in 1999.

Certification

I certify under penalty of law that I have personally examined and am 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).

M E Lee Date: 6/9/00
M. E. Lee
DOE Site Closure Program Manager
Rocketdyne
The Boeing Company

Philip R. Bochune Date: 6/14/2000
For D. Sutherland
DOE Site Closure Manager
Oakland Operations Office
U. S. Department of Energy

Section IV. Additional Information

The estimated dose due to potential release from the area source in 1999 is 6.6E-07 mrem (6.6E-11 Sv). Since the release from the area source was too small to measure, potential release was estimated using the resuspension model in RESRAD computer program (ANL/ES-160). This estimated release was used as input in the CAP88-PC program to perform the area source dose assessment. Release from this source has not been detected by the onsite continuous ambient air samplers. There were no unplanned releases in 1999.

Supplemental Information

The collective Effective Dose Equivalent resulting from the DOE operations at SSFL during 1999 is calculated to be 4.8E-05 person-rem (4.8E-07 person-Sv). The presumed release from the area source implies an additional collective dose of 4.7E-05 person-rem (4.7E-07 person-Sv).

The population doses were calculated using CAP88-PC in the "POPULATION" mode. The site-specific population distribution is based on the 1990 census data, supplemented by estimates of personnel onsite. The population distribution is presented in a structure utilizing 16 directions, coinciding with the wind directions, and 13 radial zones, with the distances chosen to represent the center-of-area for each zone. These zones include the population within 80 km of the site. Doses due to both point and area sources were included, as described above.

No operations regulated by Subparts Q and T were conducted in 1999, nor were there any emissions of Rn-220 from sources containing U-232 and Th-232. There were no non-disposal/non-storage sources of Rn-222 emission.

Based on the evaluation of each source with the assumption of no pollution control equipment installed, none of the sources requires monitoring as prescribed in 40CFR61.93(b). The stack effluent at RMHF is continuously sampled, counted for gross alpha and beta activity weekly, and composited annually for detailed radiochemical analysis. In addition, a sample of the evaporator feedwater is analyzed for tritium, and this measured concentration is used to calculate the release. Ambient air is continuously sampled on a weekly basis, with weekly determination of gross alpha and beta activity, and these samples are composited (separately by location) annually for detailed radiochemical analysis. Aspects of the QA program described by Appendix B, Method 114 are implemented as appropriate for the low level of this surveillance effort.

C A P 8 8 - P C

Version 2.00

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 11, 2000 10:39 am

Facility: RMHF
Address: SSFL, Top of Woolsey Canyon Road, Simi Hills
City: Chatsworth
State: CA Zip: 91311-

Source Category: DOE facility
Source Type: Stack
Emission Year: 1999

Comments: CAP88PC calculation for 1999 ASER
Maximum Exposed Individual, RMHF Stack

Effective Dose Equivalent (mrem/year)
2.16E-07

At This Location: 2867 Meters Northwest

Dataset Name: RMHF99IND
Dataset Date: May 11, 2000 10:38 am
Wind File: C:\CAP88PC2\WNDFILES\SSFLNRC.WND

MAXIMALLY EXPOSED INDIVIDUAL

Location Of The Individual: 2867 Meters Northwest
Lifetime Fatal Cancer Risk: 5.20E-12

ORGAN DOSE EQUIVALENT SUMMARY

Organ	Dose Equivalent (mrem/y)
GONADS	2.53E-07
BREAST	2.29E-07
R MAR	1.93E-07
LUNGS	1.97E-07
THYROID	2.39E-07
ENDOST	2.12E-07
RMNDR	1.93E-07
EFFEC	2.16E-07

RADIONUCLIDE EMISSIONS DURING THE YEAR 1999

Nuclide	Class	Size	Source #1 Ci/y	TOTAL Ci/y
CO-60	Y	1.00	6.8E-08	6.8E-08
CS-137	D	1.00	1.5E-07	1.5E-07
BA-137M	D	1.00	1.4E-07	1.4E-07
H-3	*	0.00	3.8E-06	3.8E-06

SITE INFORMATION

Temperature:	17 degrees C
Precipitation:	85 cm/y
Mixing Height:	366 m

SOURCE INFORMATION

Source Number: 1

Stack Height (m): 40.
Diameter (m): 1.

Plume Rise Momentum (m/s): 11.
(Exit Velocity)

AGRICULTURAL DATA

	Vegetable	Milk	Meat
Fraction Home Produced:	0.020	0.000	0.000
Fraction From Assessment Area:	0.000	0.000	0.000
Fraction Imported:	0.980	1.000	1.000

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

DISTANCES (M) USED FOR MAXIMUM INDIVIDUAL ASSESSMENT

2867

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Version 2.00

Clean Air Act Assessment Package - 1988

D O S E A N D R I S K E Q U I V A L E N T S U M M A R I E S

Non-Radon Individual Assessment
May 11, 2000 10:39 am

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Source Type: Stack
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Comments: CAP88PC calculation for 1999 ASER
Maximum Exposed Individual, RMHF Stack

Dataset Name: RMHF99IND
Dataset Date: May 11, 2000 10:38 am
Wind File: C:\CAP88PC2\WNDFILES\SSFLNRC.WND

ORGAN DOSE EQUIVALENT SUMMARY

Organ	Selected Individual (mrem/y)
GONADS	2.53E-07
BREAST	2.29E-07
R MAR	1.93E-07
LUNGS	1.97E-07
THYROID	2.39E-07
ENDOST	2.12E-07
RMNDR	1.93E-07
EFFEC	2.16E-07

PATHWAY EFFECTIVE DOSE EQUIVALENT SUMMARY

Pathway	Selected Individual (mrem/y)
INGESTION	3.07E-10
INHALATION	1.44E-09
AIR IMMERSION	7.99E-12
GROUND SURFACE	2.14E-07
INTERNAL	1.75E-09
EXTERNAL	2.14E-07
TOTAL	2.16E-07

NUCLIDE EFFECTIVE DOSE EQUIVALENT SUMMARY

Nuclide	Selected Individual (mrem/y)
CO-60	7.37E-08
CS-137	5.78E-10
BA-137M	1.41E-07
H-3	4.07E-11
TOTAL	2.16E-07

CANCER RISK SUMMARY

Cancer	Selected Individual Total Lifetime Fatal Cancer Risk
LEUKEMIA	6.12E-13
BONE	3.75E-14
THYROID	1.09E-13
BREAST	8.98E-13
LUNG	9.83E-13
STOMACH	5.74E-13
BOWEL	2.87E-13
LIVER	6.28E-13
PANCREAS	3.77E-13
URINARY	2.36E-13
OTHER	4.62E-13
TOTAL	5.20E-12

PATHWAY RISK SUMMARY

Pathway	Selected Individual Total Lifetime Fatal Cancer Risk
INGESTION	8.09E-15
INHALATION	5.65E-14
AIR IMMERSION	1.93E-16
GROUND SURFACE	5.14E-12
INTERNAL	6.46E-14
EXTERNAL	5.14E-12
TOTAL	5.20E-12

NUCLIDE RISK SUMMARY

Nuclide	Selected Individual Total Lifetime Fatal Cancer Risk
CO-60	1.80E-12
CS-137	1.52E-14
BA-137M	3.39E-12
H-3	1.11E-15
TOTAL	5.20E-12

INDIVIDUAL EFFECTIVE DOSE EQUIVALENT RATE (mrem/y)
(All Radionuclides and Pathways)

	Distance (m)
Direction	2867
N	4.2E-08
NNW	1.3E-07
NW	2.2E-07
WNW	1.3E-07
W	3.5E-08
WSW	4.7E-08
SW	5.4E-08
SSW	4.8E-08
S	4.3E-08
SSE	9.1E-08
SE	1.4E-07
ESE	8.4E-08
E	2.9E-08
ENE	3.3E-08
NE	3.8E-08
NNE	4.0E-08

INDIVIDUAL LIFETIME RISK (deaths)
(All Radionuclides and Pathways)

Direction	Distance (m) 2867
N	1.0E-12
NNW	3.1E-12
NW	5.2E-12
WNW	3.0E-12
W	8.4E-13
WSW	1.1E-12
SW	1.3E-12
SSW	1.2E-12
S	1.0E-12
SSE	2.2E-12
SE	3.3E-12
ESE	2.0E-12
E	7.0E-13
ENE	8.0E-13
NE	9.1E-13
NNE	9.6E-13

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Version 2.00

Clean Air Act Assessment Package - 1988

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

Non-Radon Population Assessment
May 11, 2000 10:41 am

Facility: RMHF
Address: SSFL, Top of Woolsey Canyon Road, Simi Hills
City: Chatsworth
State: CA Zip: 91311-

Source Category: DOE facility
Source Type: Stack
Emission Year: 1999

Comments: CAP88PC calculation for 1999 ASER
Population Dose, RMHF stack

Effective Dose Equivalent (mrem/year)
8.90E-07

At This Location: 800 Meters Northwest

Dataset Name: RMHF99POP
Dataset Date: May 11, 2000 10:41 am
Wind File: C:\CAP88PC2\WNDFILES\SSFLNRC.WND
Population File: C:\CAP88PC2\POPFILES\SSFL_91.POP

MAXIMALLY EXPOSED INDIVIDUAL

Location Of The Individual: 800 Meters Northwest
Lifetime Fatal Cancer Risk: 2.15E-11

ORGAN DOSE EQUIVALENT SUMMARY

Organ	Selected Individual (mrem/y)	Collective Population (person-rem/y)
GONADS	1.04E-06	5.57E-05
BREAST	9.45E-07	5.06E-05
R MAR	7.97E-07	4.26E-05
LUNGS	8.17E-07	4.37E-05
THYROID	9.85E-07	5.27E-05
ENDOST	8.72E-07	4.66E-05
RMNDR	7.95E-07	4.25E-05
EFFEC	8.90E-07	4.76E-05

FREQUENCY DISTRIBUTION OF LIFETIME FATAL CANCER RISKS

Risk Range	# of People	# 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	9452288	9452288	1.62E-08	1.62E-08

RADIONUCLIDE EMISSIONS DURING THE YEAR 1999

Nuclide	Class	Size	Source #1 Ci/y	TOTAL Ci/y
CO-60	Y	1.00	6.8E-08	6.8E-08
CS-137	D	1.00	1.5E-07	1.5E-07
BA-137M	D	1.00	1.4E-07	1.4E-07
H-3	*	0.00	3.8E-06	3.8E-06

SITE INFORMATION

Temperature:	17 degrees C
Precipitation:	85 cm/y
Mixing Height:	366 m

SOURCE INFORMATION

Source Number: 1

Stack Height (m): 40.
Diameter (m): 1.

Plume Rise Momentum (m/s): (Exit Velocity) 11.

AGRICULTURAL DATA

	Vegetable	Milk	Meat
Fraction Home Produced:	0.020	0.000	0.000
Fraction From Assessment Area:	0.000	0.000	0.000
Fraction Imported:	0.980	1.000	1.000

Beef Cattle Density:	8.81E-02
Milk Cattle Density:	2.85E-02
Land Fraction Cultivated for Vegetable Crops:	1.18E-02

POPULATION DATA

	Distance (m)						
Direction	800	2400	4000	5600	7200	8800	10800
N	20	0	937	7718	7403	0	0
NNW	20	0	2084	9596	6032	205	0
NW	10	0	6469	8790	10481	1695	0
WNW	10	0	0	6789	6465	2442	373
W	0	0	0	0	0	4061	7128
WSW	20	0	0	4	483	3822	4895
SW	20	0	0	2792	1132	739	10070
SSW	40	0	0	0	3463	7784	6740
S	50	0	2	0	206	1172	2652
SSE	20	173	350	0	1851	2295	4036
SE	30	0	1108	1411	7181	8457	20574
ESE	40	40	0	1744	8666	13984	45966
E	15	50	200	1332	3016	5725	34747
ENE	200	40	0	0	605	3329	17424
NE	50	1019	0	7142	3247	0	0
NNE	25	0	368	7010	2437	0	82

	Distance (m)					
Direction	14000	19000	25000	34000	48000	68000
N	0	0	606	0	277	920
NNW	0	1635	25	0	132	5484
NW	0	248	12873	6493	432	248
WNW	13816	12491	1240	28192	14587	33642
W	18319	8705	23368	42645	251663	1269
WSW	17413	28959	11039	1848	16801	2
SW	12432	4196	1701	562	0	0
SSW	803	490	6193	0	0	0
S	137	4200	0	0	0	0
SSE	1637	4395	2753	0	8868	62360
SE	13226	7005	36217	452689	1018505	1370334
ESE	38990	83925	119218	421109	1583210	1599456
E	38894	132848	251735	249520	252323	260574
ENE	12658	42551	90228	6684	3403	50751
NE	937	11727	43765	60579	11947	153354
NNE	0	1649	13374	6726	1838	3437

C A P 8 8 - P C

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Clean Air Act Assessment Package - 1988

D O S E A N D R I S K E Q U I V A L E N T S U M M A R I E S

Non-Radon Population Assessment
May 11, 2000 10:41 am

Facility: RMHF
Address: SSFL, Top of Woolsey Canyon Road, Simi Hills
City: Chatsworth
State: CA Zip: 91311-

Source Category: DOE facility
Source Type: Stack
Emission Year: 1999

Comments: CAP88PC calculation for 1999 ASER
Population Dose, RMHF stack

Dataset Name: RMHF99POP
Dataset Date: May 11, 2000 10:41 am
Wind File: C:\CAP88PC2\WNDFILES\SSFLNRC.WND
Population File: C:\CAP88PC2\POPFILES\SSFL_91.POP

ORGAN DOSE EQUIVALENT SUMMARY

Organ	Selected Individual (mrem/y)	Collective Population (person-rem/y)
GONADS	1.04E-06	5.57E-05
BREAST	9.45E-07	5.06E-05
R MAR	7.97E-07	4.26E-05
LUNGS	8.17E-07	4.37E-05
THYROID	9.85E-07	5.27E-05
ENDOST	8.72E-07	4.66E-05
RMNDR	7.95E-07	4.25E-05
EFFEC	8.90E-07	4.76E-05

PATHWAY EFFECTIVE DOSE EQUIVALENT SUMMARY

Pathway	Selected Individual (mrem/y)	Collective Population (person-rem/y)
INGESTION	1.27E-09	6.86E-08
INHALATION	7.09E-09	3.81E-07
AIR IMMERSION	4.20E-11	2.06E-09
GROUND SURFACE	8.81E-07	4.71E-05
INTERNAL	8.36E-09	4.50E-07
EXTERNAL	8.81E-07	4.71E-05
TOTAL	8.90E-07	4.76E-05

NUCLIDE EFFECTIVE DOSE EQUIVALENT SUMMARY

Nuclides	Selected Individual (mrem/y)	Collective Population (person-rem/y)
CO-60	3.04E-07	1.63E-05
CS-137	2.65E-09	1.40E-07
BA-137M	5.82E-07	3.12E-05
H-3	1.96E-10	1.73E-08
TOTAL	8.90E-07	4.76E-05

CANCER RISK SUMMARY

Cancer	Selected Individual Total Lifetime Fatal Cancer Risk	Total Collective Population Fatal Cancer Risk (Deaths/y)
LEUKEMIA	2.52E-12	1.91E-09
BONE	1.54E-13	1.17E-10
THYROID	4.48E-13	3.39E-10
BREAST	3.70E-12	2.80E-09
LUNG	4.08E-12	3.08E-09
STOMACH	2.37E-12	1.79E-09
BOWEL	1.18E-12	8.93E-10
LIVER	2.59E-12	1.96E-09
PANCREAS	1.56E-12	1.18E-09
URINARY	9.73E-13	7.35E-10
OTHER	1.90E-12	1.44E-09
TOTAL	2.15E-11	1.62E-08

PATHWAY RISK SUMMARY

Pathway	Selected Individual Total Lifetime Fatal Cancer Risk	Total Collective Population Fatal Cancer Risk (Deaths/y)
INGESTION	3.34E-14	2.55E-11
INHALATION	2.78E-13	2.10E-10
AIR IMMERSION	1.01E-15	7.05E-13
GROUND SURFACE	2.12E-11	1.60E-08
INTERNAL	3.12E-13	2.36E-10
EXTERNAL	2.12E-11	1.60E-08
TOTAL	2.15E-11	1.62E-08

PATHWAY GENETIC RISK SUMMARY
(Collective Population)

Pathway	Genetic Risk (person-rem/y)
INGESTION	6.27E-08
INHALATION	1.08E-07
AIR IMMERSION	2.04E-09
GROUND SURFACE	4.66E-05
INTERNAL	1.70E-07
EXTERNAL	4.66E-05
TOTAL	4.68E-05

NUCLIDE RISK SUMMARY

Nuclide	Selected Individual Total Lifetime Fatal Cancer Risk	Total Collective Population Fatal Cancer Risk (Deaths/y)
CO-60	7.46E-12	5.63E-09
CS-137	6.96E-14	5.22E-11
BA-137M	1.39E-11	1.05E-08
H-3	5.34E-15	6.67E-12
TOTAL	2.15E-11	1.62E-08

INDIVIDUAL EFFECTIVE DOSE EQUIVALENT RATE (mrem/y)
(All Radionuclides and Pathways)

	Distance (m)						
Direction	800	2400	4000	5600	7200	8800	10800
N	1.8E-07	0.0E+00	3.1E-08	2.3E-08	1.8E-08	0.0E+00	0.0E+00
NNW	5.3E-07	0.0E+00	9.6E-08	6.9E-08	5.5E-08	4.5E-08	0.0E+00
NW	8.9E-07	0.0E+00	1.6E-07	1.2E-07	9.1E-08	7.4E-08	0.0E+00
WNW	5.1E-07	0.0E+00	0.0E+00	6.8E-08	5.3E-08	4.4E-08	3.5E-08
W	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	1.3E-08	1.0E-08
WSW	1.9E-07	0.0E+00	0.0E+00	2.5E-08	2.0E-08	1.6E-08	1.3E-08
SW	2.6E-07	0.0E+00	0.0E+00	2.8E-08	2.2E-08	1.8E-08	1.4E-08
SSW	2.1E-07	0.0E+00	0.0E+00	0.0E+00	2.0E-08	1.6E-08	1.3E-08
S	1.7E-07	0.0E+00	3.2E-08	0.0E+00	1.8E-08	1.5E-08	1.2E-08
SSE	3.8E-07	1.1E-07	6.6E-08	0.0E+00	3.7E-08	3.1E-08	2.5E-08
SE	5.8E-07	0.0E+00	1.0E-07	7.1E-08	5.6E-08	4.6E-08	3.7E-08
ESE	3.5E-07	9.9E-08	0.0E+00	4.4E-08	3.5E-08	2.8E-08	2.3E-08
E	1.2E-07	3.4E-08	2.2E-08	1.6E-08	1.3E-08	1.0E-08	8.4E-09
ENE	1.4E-07	3.9E-08	0.0E+00	0.0E+00	1.4E-08	1.2E-08	9.5E-09
NE	1.6E-07	4.5E-08	0.0E+00	2.0E-08	1.6E-08	0.0E+00	0.0E+00
NNE	1.7E-07	0.0E+00	3.0E-08	2.2E-08	1.7E-08	0.0E+00	1.1E-08

	Distance (m)					
Direction	14000	19000	25000	34000	48000	68000
N	0.0E+00	0.0E+00	4.1E-09	0.0E+00	1.6E-09	7.9E-10
NNW	0.0E+00	1.8E-08	1.3E-08	0.0E+00	5.0E-09	2.6E-09
NW	0.0E+00	3.1E-08	2.1E-08	1.4E-08	8.5E-09	4.4E-09
WNW	2.6E-08	1.8E-08	1.2E-08	8.2E-09	4.9E-09	2.5E-09
W	7.7E-09	5.2E-09	3.5E-09	2.3E-09	1.3E-09	6.4E-10
WSW	9.7E-09	6.7E-09	4.6E-09	3.1E-09	2.0E-09	1.1E-09
SW	1.1E-08	7.7E-09	5.4E-09	3.8E-09	0.0E+00	0.0E+00
SSW	9.8E-09	6.9E-09	4.8E-09	0.0E+00	0.0E+00	0.0E+00
S	8.9E-09	6.2E-09	0.0E+00	0.0E+00	0.0E+00	0.0E+00
SSE	1.8E-08	1.3E-08	8.9E-09	0.0E+00	3.8E-09	2.1E-09
SE	2.8E-08	1.9E-08	1.4E-08	9.3E-09	5.9E-09	3.3E-09
ESE	1.7E-08	1.2E-08	8.3E-09	5.6E-09	3.5E-09	1.9E-09
E	6.2E-09	4.2E-09	2.8E-09	1.9E-09	1.1E-09	5.2E-10
ENE	7.0E-09	4.8E-09	3.3E-09	2.2E-09	1.3E-09	6.4E-10
NE	7.9E-09	5.4E-09	3.7E-09	2.5E-09	1.5E-09	7.6E-10
NNE	0.0E+00	5.7E-09	3.9E-09	2.6E-09	1.5E-09	7.8E-10

COLLECTIVE EFFECTIVE DOSE EQUIVALENT (person rem/y)
(All Radionuclides and Pathways)

	Distance (m)						
Direction	800	2400	4000	5600	7200	8800	10800
N	3.6E-09	0.0E+00	2.9E-08	1.8E-07	1.3E-07	0.0E+00	0.0E+00
NNW	1.1E-08	0.0E+00	2.0E-07	6.6E-07	3.3E-07	9.1E-09	0.0E+00
NW	8.9E-09	0.0E+00	1.0E-06	1.0E-06	9.5E-07	1.3E-07	0.0E+00
WNW	5.1E-09	0.0E+00	0.0E+00	4.6E-07	3.5E-07	1.1E-07	1.3E-08
W	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	5.2E-08	7.4E-08
WSW	3.9E-09	0.0E+00	0.0E+00	1.0E-10	9.5E-09	6.2E-08	6.3E-08
SW	5.1E-09	0.0E+00	0.0E+00	7.7E-08	2.5E-08	1.3E-08	1.5E-07
SSW	8.5E-09	0.0E+00	0.0E+00	0.0E+00	6.9E-08	1.3E-07	8.9E-08
S	8.4E-09	0.0E+00	6.4E-11	0.0E+00	3.8E-09	1.8E-08	3.2E-08
SSE	7.5E-09	1.8E-08	2.3E-08	0.0E+00	6.9E-08	7.0E-08	9.9E-08
SE	1.7E-08	0.0E+00	1.1E-07	1.0E-07	4.0E-07	3.9E-07	7.6E-07
ESE	1.4E-08	4.0E-09	0.0E+00	7.7E-08	3.0E-07	4.0E-07	1.1E-06
E	1.8E-09	1.7E-09	4.3E-09	2.1E-08	3.8E-08	6.0E-08	2.9E-07
ENE	2.8E-08	1.6E-09	0.0E+00	0.0E+00	8.7E-09	3.9E-08	1.7E-07
NE	8.2E-09	4.6E-08	0.0E+00	1.4E-07	5.2E-08	0.0E+00	0.0E+00
NNE	4.3E-09	0.0E+00	1.1E-08	1.5E-07	4.2E-08	0.0E+00	9.2E-10

	Distance (m)					
Direction	14000	19000	25000	34000	48000	68000
N	0.0E+00	0.0E+00	2.5E-09	0.0E+00	4.4E-10	7.3E-10
NNW	0.0E+00	3.0E-08	3.1E-10	0.0E+00	6.6E-10	1.4E-08
NW	0.0E+00	7.6E-09	2.7E-07	9.2E-08	3.7E-09	1.1E-09
WNW	3.6E-07	2.2E-07	1.5E-08	2.3E-07	7.2E-08	8.5E-08
W	1.4E-07	4.6E-08	8.2E-08	9.9E-08	3.4E-07	8.2E-10
WSW	1.7E-07	1.9E-07	5.1E-08	5.8E-09	3.3E-08	2.2E-12
SW	1.3E-07	3.2E-08	9.3E-09	2.1E-09	0.0E+00	0.0E+00
SSW	7.9E-09	3.4E-09	3.0E-08	0.0E+00	0.0E+00	0.0E+00
S	1.2E-09	2.6E-08	0.0E+00	0.0E+00	0.0E+00	0.0E+00
SSE	3.0E-08	5.6E-08	2.5E-08	0.0E+00	3.4E-08	1.3E-07
SE	3.7E-07	1.4E-07	4.9E-07	4.2E-06	6.0E-06	4.5E-06
ESE	6.7E-07	1.0E-06	9.9E-07	2.4E-06	5.5E-06	3.1E-06
E	2.4E-07	5.6E-07	7.2E-07	4.6E-07	2.7E-07	1.3E-07
ENE	8.9E-08	2.0E-07	3.0E-07	1.4E-08	4.3E-09	3.2E-08
NE	7.4E-09	6.4E-08	1.6E-07	1.5E-07	1.8E-08	1.2E-07
NNE	0.0E+00	9.5E-09	5.2E-08	1.7E-08	2.8E-09	2.7E-09

INDIVIDUAL LIFETIME RISK (deaths)
(All Radionuclides and Pathways)

	Distance (m)						
Direction	800	2400	4000	5600	7200	8800	10800
N	4.3E-12	0.0E+00	7.5E-13	5.5E-13	4.3E-13	0.0E+00	0.0E+00
NNW	1.3E-11	0.0E+00	2.3E-12	1.7E-12	1.3E-12	1.1E-12	0.0E+00
NW	2.1E-11	0.0E+00	3.9E-12	2.8E-12	2.2E-12	1.8E-12	0.0E+00
WNW	1.2E-11	0.0E+00	0.0E+00	1.6E-12	1.3E-12	1.1E-12	8.5E-13
W	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	3.1E-13	2.5E-13
WSW	4.7E-12	0.0E+00	0.0E+00	6.1E-13	4.8E-13	3.9E-13	3.1E-13
SW	6.2E-12	0.0E+00	0.0E+00	6.6E-13	5.3E-13	4.3E-13	3.5E-13
SSW	5.1E-12	0.0E+00	0.0E+00	0.0E+00	4.8E-13	3.9E-13	3.2E-13
S	4.1E-12	0.0E+00	7.7E-13	0.0E+00	4.4E-13	3.6E-13	2.9E-13
SSE	9.1E-12	2.6E-12	1.6E-12	0.0E+00	9.0E-13	7.4E-13	5.9E-13
SE	1.4E-11	0.0E+00	2.4E-12	1.7E-12	1.4E-12	1.1E-12	8.9E-13
ESE	8.5E-12	2.4E-12	0.0E+00	1.1E-12	8.4E-13	6.9E-13	5.5E-13
E	2.8E-12	8.2E-13	5.2E-13	3.9E-13	3.1E-13	2.5E-13	2.0E-13
ENE	3.4E-12	9.5E-13	0.0E+00	0.0E+00	3.5E-13	2.8E-13	2.3E-13
NE	4.0E-12	1.1E-12	0.0E+00	4.9E-13	3.9E-13	0.0E+00	0.0E+00
NNE	4.1E-12	0.0E+00	7.1E-13	5.2E-13	4.1E-13	0.0E+00	2.7E-13

	Distance (m)					
Direction	14000	19000	25000	34000	48000	68000
N	0.0E+00	0.0E+00	9.9E-14	0.0E+00	3.8E-14	1.9E-14
NNW	0.0E+00	4.4E-13	3.0E-13	0.0E+00	1.2E-13	6.3E-14
NW	0.0E+00	7.4E-13	5.1E-13	3.4E-13	2.1E-13	1.1E-13
WNW	6.3E-13	4.3E-13	3.0E-13	2.0E-13	1.2E-13	6.1E-14
W	1.9E-13	1.3E-13	8.5E-14	5.6E-14	3.2E-14	1.6E-14
WSW	2.3E-13	1.6E-13	1.1E-13	7.6E-14	4.7E-14	2.6E-14
SW	2.6E-13	1.8E-13	1.3E-13	9.1E-14	0.0E+00	0.0E+00
SSW	2.4E-13	1.7E-13	1.2E-13	0.0E+00	0.0E+00	0.0E+00
S	2.2E-13	1.5E-13	0.0E+00	0.0E+00	0.0E+00	0.0E+00
SSE	4.5E-13	3.1E-13	2.2E-13	0.0E+00	9.2E-14	5.0E-14
SE	6.7E-13	4.7E-13	3.3E-13	2.3E-13	1.4E-13	7.9E-14
ESE	4.1E-13	2.9E-13	2.0E-13	1.4E-13	8.4E-14	4.6E-14
E	1.5E-13	1.0E-13	6.9E-14	4.5E-14	2.6E-14	1.2E-14
ENE	1.7E-13	1.2E-13	7.9E-14	5.2E-14	3.1E-14	1.5E-14
NE	1.9E-13	1.3E-13	9.0E-14	6.0E-14	3.6E-14	1.8E-14
NNE	0.0E+00	1.4E-13	9.5E-14	6.3E-14	3.7E-14	1.9E-14

COLLECTIVE FATAL CANCER RATE (deaths/y)
(All Radionuclides and Pathways)

	Distance (m)						
Direction	800	2400	4000	5600	7200	8800	10800
N	1.2E-12	0.0E+00	1.0E-11	6.0E-11	4.5E-11	0.0E+00	0.0E+00
NNW	3.6E-12	0.0E+00	6.8E-11	2.3E-10	1.1E-10	3.1E-12	0.0E+00
NW	3.0E-12	0.0E+00	3.5E-10	3.5E-10	3.2E-10	4.3E-11	0.0E+00
WNW	1.7E-12	0.0E+00	0.0E+00	1.6E-10	1.2E-10	3.6E-11	4.5E-12
W	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	1.8E-11	2.5E-11
WSW	1.3E-12	0.0E+00	0.0E+00	3.4E-14	3.3E-12	2.1E-11	2.2E-11
SW	1.7E-12	0.0E+00	0.0E+00	2.6E-11	8.4E-12	4.5E-12	5.0E-11
SSW	2.9E-12	0.0E+00	0.0E+00	0.0E+00	2.4E-11	4.3E-11	3.0E-11
S	2.9E-12	0.0E+00	2.2E-14	0.0E+00	1.3E-12	6.0E-12	1.1E-11
SSE	2.6E-12	6.3E-12	7.9E-12	0.0E+00	2.4E-11	2.4E-11	3.4E-11
SE	6.0E-12	0.0E+00	3.8E-11	3.4E-11	1.4E-10	1.3E-10	2.6E-10
ESE	4.8E-12	1.3E-12	0.0E+00	2.6E-11	1.0E-10	1.4E-10	3.6E-10
E	6.0E-13	5.8E-13	1.5E-12	7.3E-12	1.3E-11	2.0E-11	9.9E-11
ENE	9.6E-12	5.3E-13	0.0E+00	0.0E+00	3.0E-12	1.3E-11	5.6E-11
NE	2.8E-12	1.6E-11	0.0E+00	4.9E-11	1.8E-11	0.0E+00	0.0E+00
NNE	1.5E-12	0.0E+00	3.7E-12	5.1E-11	1.4E-11	0.0E+00	3.1E-13

	Distance (m)					
Direction	14000	19000	25000	34000	48000	68000
N	0.0E+00	0.0E+00	8.5E-13	0.0E+00	1.5E-13	2.5E-13
NNW	0.0E+00	1.0E-11	1.1E-13	0.0E+00	2.3E-13	4.9E-12
NW	0.0E+00	2.6E-12	9.3E-11	3.1E-11	1.3E-12	3.7E-13
WNW	1.2E-10	7.7E-11	5.2E-12	7.9E-11	2.4E-11	2.9E-11
W	4.8E-11	1.6E-11	2.8E-11	3.4E-11	1.2E-10	2.8E-13
WSW	5.7E-11	6.6E-11	1.7E-11	2.0E-12	1.1E-11	7.4E-16
SW	4.6E-11	1.1E-11	3.2E-12	7.2E-13	0.0E+00	0.0E+00
SSW	2.7E-12	1.1E-12	1.0E-11	0.0E+00	0.0E+00	0.0E+00
S	4.2E-13	8.8E-12	0.0E+00	0.0E+00	0.0E+00	0.0E+00
SSE	1.0E-11	1.9E-11	8.4E-12	0.0E+00	1.1E-11	4.4E-11
SE	1.3E-10	4.6E-11	1.7E-10	1.4E-09	2.0E-09	1.5E-09
ESE	2.3E-10	3.4E-10	3.4E-10	8.1E-10	1.9E-09	1.0E-09
E	8.2E-11	1.9E-10	2.4E-10	1.6E-10	9.2E-11	4.6E-11
ENE	3.0E-11	7.0E-11	1.0E-10	4.9E-12	1.5E-12	1.1E-11
NE	2.5E-12	2.2E-11	5.6E-11	5.1E-11	6.0E-12	4.0E-11
NNE	0.0E+00	3.2E-12	1.8E-11	6.0E-12	9.6E-13	9.1E-13

C A P 8 8 - P C

Version 2.00

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 11, 2000 10:34 am

Facility: Santa Susana Field Laboratory
Address: SSFL, Top of Woolsey Canyon Road, Simi Hills
City: Chatsworth
State: CA Zip: 91311-

Source Category: DOE facilities
Source Type: Area
Emission Year: 1999

Comments: CAP88PC calculation for 1999 NESHAPs and ASER
Individual dose, RMHF pond area source.

Effective Dose Equivalent (mrem/year)
6.62E-07

At This Location: 2867 Meters Northwest

Dataset Name: AREA99IND
Dataset Date: May 11, 2000 10:34 am
Wind File: C:\CAP88PC2\WNDFILES\SSFLNRC.WND

MAXIMALLY EXPOSED INDIVIDUAL

Location Of The Individual: 2867 Meters Northwest
Lifetime Fatal Cancer Risk: 1.59E-11

ORGAN DOSE EQUIVALENT SUMMARY

Organ	Dose Equivalent (mrem/y)
GONADS	7.75E-07
BREAST	7.06E-07
R MAR	5.92E-07
LUNGS	6.04E-07
THYROID	7.33E-07
ENDOST	6.54E-07
RMNDR	5.89E-07
EFFEC	6.62E-07

RADIONUCLIDE EMISSIONS DURING THE YEAR 1999

Nuclide	Class	Size	Source #1 Ci/y	TOTAL Ci/y
CO-60	Y	1.00	2.9E-08	2.9E-08
CS-137	D	1.00	1.9E-07	1.9E-07
BA-137M	D	1.00	1.8E-07	1.8E-07

SITE INFORMATION

Temperature:	17	degrees C
Precipitation:	85	cm/y
Mixing Height:	366	m

SOURCE INFORMATION

Source Number: 1

Source Height (m): -2.
Area (sq m): 58.

Plume Rise Pasquill Cat:	A	B	C	D	E	F	G
Zero:	0.	0.	0.	0.	0.	0.	0.

AGRICULTURAL DATA

	Vegetable	Milk	Meat
Fraction Home Produced:	0.020	0.000	0.000
Fraction From Assessment Area:	0.000	0.000	0.000
Fraction Imported:	0.980	1.000	1.000

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

DISTANCES (M) USED FOR MAXIMUM INDIVIDUAL ASSESSMENT

2867

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D O S E A N D R I S K E Q U I V A L E N T S U M M A R I E S

Non-Radon Individual Assessment
May 11, 2000 10:34 am

Facility: Santa Susana Field Laboratory
Address: SSFL, Top of Woolsey Canyon Road, Simi Hills
City: Chatsworth
State: CA Zip: 91311-

Source Category: DOE facilities
Source Type: Area
Emission Year: 1999

Comments: CAP88PC calculation for 1999 NESHAPs and ASER
Individual dose, RMHF pond area source.

Dataset Name: AREA99IND
Dataset Date: May 11, 2000 10:34 am
Wind File: C:\CAP88PC2\WNDFILES\SSFLNRC.WND

ORGAN DOSE EQUIVALENT SUMMARY

Organ	Selected Individual (mrem/y)
GONADS	7.75E-07
BREAST	7.06E-07
R MAR	5.92E-07
LUNGS	6.04E-07
THYROID	7.33E-07
ENDOST	6.54E-07
RMNDR	5.89E-07
EFFEC	6.62E-07

PATHWAY EFFECTIVE DOSE EQUIVALENT SUMMARY

Pathway	Selected Individual (mrem/y)
INGESTION	1.06E-09
INHALATION	6.36E-09
AIR IMMERSION	2.48E-11
GROUND SURFACE	6.54E-07
INTERNAL	7.42E-09
EXTERNAL	6.54E-07
TOTAL	6.62E-07

NUCLIDE EFFECTIVE DOSE EQUIVALENT SUMMARY

Nuclide	Selected Individual (mrem/y)
CO-60	9.80E-08
CS-137	4.04E-09
BA-137M	5.59E-07
TOTAL	6.62E-07

CANCER RISK SUMMARY

Cancer	Selected Individual Total Lifetime Fatal Cancer Risk
LEUKEMIA	1.88E-12
BONE	1.16E-13
THYROID	3.33E-13
BREAST	2.77E-12
LUNG	3.01E-12
STOMACH	1.76E-12
BOWEL	8.73E-13
LIVER	1.92E-12
PANCREAS	1.15E-12
URINARY	7.21E-13
OTHER	1.41E-12
TOTAL	1.59E-11

PATHWAY RISK SUMMARY

Pathway	Selected Individual Total Lifetime Fatal Cancer Risk
INGESTION	2.78E-14
INHALATION	2.25E-13
AIR IMMERSION	5.99E-16
GROUND SURFACE	1.57E-11
INTERNAL	2.52E-13
EXTERNAL	1.57E-11
TOTAL	1.59E-11

NUCLIDE RISK SUMMARY

Nuclide	Selected Individual Total Lifetime Fatal Cancer Risk
CO-60	2.43E-12
CS-137	1.07E-13
BA-137M	1.34E-11
TOTAL	1.59E-11

INDIVIDUAL EFFECTIVE DOSE EQUIVALENT RATE (mrem/y)
(All Radionuclides and Pathways)

	Distance (m)
Direction	2867
N	1.3E-07
NNW	4.0E-07
NW	6.6E-07
WNW	4.0E-07
W	1.3E-07
WSW	1.3E-07
SW	1.3E-07
SSW	1.3E-07
S	1.4E-07
SSE	2.7E-07
SE	4.0E-07
ESE	2.5E-07
E	9.8E-08
ENE	1.1E-07
NE	1.1E-07
NNE	1.2E-07

INDIVIDUAL LIFETIME RISK (deaths)
(All Radionuclides and Pathways)

	Distance (m)
Direction	2867
N	3.1E-12
NNW	9.6E-12
NW	1.6E-11
WNW	9.5E-12
W	3.1E-12
WSW	3.1E-12
SW	3.1E-12
SSW	3.2E-12
S	3.3E-12
SSE	6.4E-12
SE	9.6E-12
ESE	6.0E-12
E	2.4E-12
ENE	2.5E-12
NE	2.7E-12
NNE	2.9E-12

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Version 2.00

Clean Air Act Assessment Package - 1988

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

Non-Radon Population Assessment
May 11, 2000 08:17 am

Facility: Santa Susana Field Laboratory
Address: SSFL, Top of Woolsey Canyon Road, Simi Hills
City: Chatsworth
State: CA Zip: 91311-

Source Category: DOE facilities
Source Type: Area
Emission Year: 1999

Comments: CAP88PC calculation for 1999 NESHAPs and ASER
Population dose, RMHF pond area source.

Effective Dose Equivalent (mrem/year)
6.95E-06

At This Location: 800 Meters Northwest

Dataset Name: AREA99POP
Dataset Date: May 11, 2000 08:16 am
Wind File: C:\CAP88PC2\WNDFILES\SSFLNRC.WND
Population File: C:\CAP88PC2\POPFILES\SSFL_91.POP

MAXIMALLY EXPOSED INDIVIDUAL

Location Of The Individual: 800 Meters Northwest
Lifetime Fatal Cancer Risk: 1.67E-10

ORGAN DOSE EQUIVALENT SUMMARY

Organ	Selected Individual (mrem/y)	Collective Population (person-rem/y)
GONADS	8.13E-06	5.53E-05
BREAST	7.42E-06	5.04E-05
R MAR	6.22E-06	4.23E-05
LUNGS	6.36E-06	4.28E-05
THYROID	7.69E-06	5.23E-05
ENDOST	6.87E-06	4.67E-05
RMNDR	6.19E-06	4.20E-05
EFFEC	6.95E-06	4.72E-05

FREQUENCY DISTRIBUTION OF LIFETIME FATAL CANCER RISKS

Risk Range	# of People	# 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	9452288	9452288	1.60E-08	1.60E-08

RADIONUCLIDE EMISSIONS DURING THE YEAR 1999

Nuclide	Class	Size	Source #1 Ci/y	TOTAL Ci/y
CO-60	Y	1.00	2.9E-08	2.9E-08
CS-137	D	1.00	1.9E-07	1.9E-07
BA-137M	D	1.00	1.8E-07	1.8E-07

SITE INFORMATION

Temperature:	17 degrees C
Precipitation:	85 cm/y
Mixing Height:	366 m

SOURCE INFORMATION

Source Number: 1

Source Height (m): -2.
Area (sq m): 58.

Plume Rise Pasquill Cat:	A	B	C	D	E	F	G
Zero:	0.	0.	0.	0.	0.	0.	0.

AGRICULTURAL DATA

	Vegetable	Milk	Meat
Fraction Home Produced:	0.020	0.000	0.000
Fraction From Assessment Area:	0.000	0.000	0.000
Fraction Imported:	0.980	1.000	1.000

Beef Cattle Density:	8.81E-02
Milk Cattle Density:	2.85E-02
Land Fraction Cultivated for Vegetable Crops:	1.18E-02

POPULATION DATA

Direction	Distance (m) 800	2400	4000	5600	7200	8800	10800
N	20	0	937	7718	7403	0	0
NNW	20	0	2084	9596	6032	205	0
NW	10	0	6469	8790	10481	1695	0
WNW	10	0	0	6789	6465	2442	373
W	0	0	0	0	0	4061	7128
WSW	20	0	0	4	483	3822	4895
SW	20	0	0	2792	1132	739	10070
SSW	40	0	0	0	3463	7784	6740
S	50	0	2	0	206	1172	2652
SSE	20	173	350	0	1851	2295	4036
SE	30	0	1108	1411	7181	8457	20574
ESE	40	40	0	1744	8666	13984	45966
E	15	50	200	1332	3016	5725	34747
ENE	200	40	0	0	605	3329	17424
NE	50	1019	0	7142	3247	0	0
NNE	25	0	368	7010	2437	0	82

Direction	Distance (m) 14000	19000	25000	34000	48000	68000
N	0	0	606	0	277	920
NNW	0	1635	25	0	132	5484
NW	0	248	12873	6493	432	248
WNW	13816	12491	1240	28192	14587	33642
W	18319	8705	23368	42645	251663	1269
WSW	17413	28959	11039	1848	16801	2
SW	12432	4196	1701	562	0	0
SSW	803	490	6193	0	0	0
S	137	4200	0	0	0	0
SSE	1637	4395	2753	0	8868	62360
SE	13226	7005	36217	452689	1018505	1370334
ESE	38990	83925	119218	421109	1583210	1599456
E	38894	132848	251735	249520	252323	260574
ENE	12658	42551	90228	6684	3403	50751
NE	937	11727	43765	60579	11947	153354
NNE	0	1649	13374	6726	1838	3437

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Clean Air Act Assessment Package - 1988

D O S E A N D R I S K E Q U I V A L E N T S U M M A R I E S

Non-Radon Population Assessment
May 11, 2000 08:17 am

Facility: Santa Susana Field Laboratory
Address: SSFL, Top of Woolsey Canyon Road, Simi Hills
City: Chatsworth
State: CA Zip: 91311-

Source Category: DOE facilities
Source Type: Area
Emission Year: 1999

Comments: CAP88PC calculation for 1999 NESHAPs and ASER
Population dose, RMHF pond area source.

Dataset Name: AREA99POP
Dataset Date: May 11, 2000 08:16 am
Wind File: C:\CAP88PC2\WNDFILES\SSFLNRC.WND
Population File: C:\CAP88PC2\POPFILES\SSFL_91.POP

ORGAN DOSE EQUIVALENT SUMMARY

Organ	Selected Individual (mrem/y)	Collective Population (person-rem/y)
GONADS	8.13E-06	5.53E-05
BREAST	7.42E-06	5.04E-05
R MAR	6.22E-06	4.23E-05
LUNGS	6.36E-06	4.28E-05
THYROID	7.69E-06	5.23E-05
ENDOST	6.87E-06	4.67E-05
RMNDR	6.19E-06	4.20E-05
EFFEC	6.95E-06	4.72E-05

PATHWAY EFFECTIVE DOSE EQUIVALENT SUMMARY

Pathway	Selected Individual (mrem/y)	Collective Population (person-rem/y)
INGESTION	1.11E-08	7.59E-08
INHALATION	7.41E-08	3.46E-07
AIR IMMERSION	3.14E-10	1.33E-09
GROUND SURFACE	6.86E-06	4.68E-05
INTERNAL	8.52E-08	4.22E-07
EXTERNAL	6.86E-06	4.68E-05
TOTAL	6.95E-06	4.72E-05

NUCLIDE EFFECTIVE DOSE EQUIVALENT SUMMARY

Nuclides	Selected Individual (mrem/y)	Collective Population (person-rem/y)
CO-60	1.03E-06	6.95E-06
CS-137	4.59E-08	2.37E-07
BA-137M	5.87E-06	4.00E-05
TOTAL	6.95E-06	4.72E-05

CANCER RISK SUMMARY

Cancer	Selected Individual Total Lifetime Fatal Cancer Risk	Total Collective Population Fatal Cancer Risk (Deaths/y)
LEUKEMIA	1.97E-11	1.89E-09
BONE	1.22E-12	1.17E-10
THYROID	3.50E-12	3.36E-10
BREAST	2.90E-11	2.79E-09
LUNG	3.18E-11	3.01E-09
STOMACH	1.85E-11	1.77E-09
BOWEL	9.17E-12	8.81E-10
LIVER	2.01E-11	1.93E-09
PANCREAS	1.21E-11	1.16E-09
URINARY	7.57E-12	7.27E-10
OTHER	1.48E-11	1.42E-09
TOTAL	1.67E-10	1.60E-08

PATHWAY RISK SUMMARY

Pathway	Selected Individual Total Lifetime Fatal Cancer Risk	Total Collective Population Fatal Cancer Risk (Deaths/y)
INGESTION	2.92E-13	2.81E-11
INHALATION	2.62E-12	1.73E-10
AIR IMMERSION	7.57E-15	4.55E-13
GROUND SURFACE	1.65E-10	1.58E-08
INTERNAL	2.91E-12	2.01E-10
EXTERNAL	1.65E-10	1.58E-08
TOTAL	1.67E-10	1.60E-08

PATHWAY GENETIC RISK SUMMARY
(Collective Population)

Pathway	Genetic Risk (person-rem/y)
INGESTION	7.05E-08
INHALATION	1.62E-07
AIR IMMERSION	1.32E-09
GROUND SURFACE	4.62E-05
INTERNAL	2.33E-07
EXTERNAL	4.62E-05
TOTAL	4.65E-05

NUCLIDE RISK SUMMARY

Nuclide	Selected Individual Total Lifetime Fatal Cancer Risk	Total Collective Population Fatal Cancer Risk (Deaths/y)
CO-60	2.57E-11	2.42E-09
CS-137	1.21E-12	8.83E-11
BA-137M	1.41E-10	1.35E-08
TOTAL	1.67E-10	1.60E-08

INDIVIDUAL EFFECTIVE DOSE EQUIVALENT RATE (mrem/y)
(All Radionuclides and Pathways)

	Distance (m)						
Direction	800	2400	4000	5600	7200	8800	10800
N	1.5E-06	0.0E+00	7.0E-08	4.1E-08	2.5E-08	0.0E+00	0.0E+00
NNW	4.2E-06	0.0E+00	2.2E-07	1.3E-07	8.1E-08	5.9E-08	0.0E+00
NW	7.0E-06	0.0E+00	3.7E-07	2.2E-07	1.4E-07	9.9E-08	0.0E+00
WNW	4.2E-06	0.0E+00	0.0E+00	1.3E-07	8.0E-08	5.8E-08	4.1E-08
W	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	1.6E-08	1.1E-08
WSW	1.4E-06	0.0E+00	0.0E+00	4.2E-08	2.6E-08	1.9E-08	1.4E-08
SW	1.3E-06	0.0E+00	0.0E+00	4.3E-08	2.8E-08	2.1E-08	1.5E-08
SSW	1.4E-06	0.0E+00	0.0E+00	0.0E+00	2.7E-08	2.0E-08	1.4E-08
S	1.5E-06	0.0E+00	7.4E-08	0.0E+00	2.6E-08	1.9E-08	1.3E-08
SSE	2.8E-06	3.7E-07	1.5E-07	0.0E+00	5.7E-08	4.1E-08	3.0E-08
SE	4.0E-06	0.0E+00	2.2E-07	1.3E-07	8.6E-08	6.3E-08	4.6E-08
ESE	2.6E-06	3.4E-07	0.0E+00	8.3E-08	5.3E-08	3.8E-08	2.7E-08
E	1.1E-06	1.4E-07	5.2E-08	3.0E-08	1.8E-08	1.3E-08	8.8E-09
ENE	1.2E-06	1.5E-07	0.0E+00	0.0E+00	2.0E-08	1.4E-08	1.0E-08
NE	1.3E-06	1.6E-07	0.0E+00	3.6E-08	2.2E-08	0.0E+00	0.0E+00
NNE	1.4E-06	0.0E+00	6.6E-08	3.8E-08	2.4E-08	0.0E+00	1.2E-08

	Distance (m)					
Direction	14000	19000	25000	34000	48000	68000
N	0.0E+00	0.0E+00	2.6E-09	0.0E+00	9.5E-10	3.8E-10
NNW	0.0E+00	1.9E-08	9.3E-09	0.0E+00	3.5E-09	1.4E-09
NW	0.0E+00	3.3E-08	1.6E-08	1.0E-08	6.1E-09	2.5E-09
WNW	2.9E-08	1.9E-08	9.0E-09	5.9E-09	3.4E-09	1.3E-09
W	7.8E-09	4.8E-09	2.0E-09	1.3E-09	6.9E-10	2.2E-10
WSW	9.8E-09	6.4E-09	3.3E-09	2.3E-09	1.4E-09	7.2E-10
SW	1.1E-08	7.5E-09	4.3E-09	3.0E-09	0.0E+00	0.0E+00
SSW	1.0E-08	6.7E-09	3.6E-09	0.0E+00	0.0E+00	0.0E+00
S	9.4E-09	6.0E-09	0.0E+00	0.0E+00	0.0E+00	0.0E+00
SSE	2.1E-08	1.4E-08	7.2E-09	0.0E+00	2.9E-09	1.3E-09
SE	3.3E-08	2.2E-08	1.1E-08	7.7E-09	4.7E-09	2.2E-09
ESE	2.0E-08	1.3E-08	6.6E-09	4.4E-09	2.6E-09	1.2E-09
E	6.1E-09	3.8E-09	1.7E-09	1.1E-09	5.8E-10	2.1E-10
ENE	7.1E-09	4.5E-09	2.1E-09	1.3E-09	7.6E-10	3.0E-10
NE	8.0E-09	5.1E-09	2.5E-09	1.6E-09	9.3E-10	4.0E-10
NNE	0.0E+00	5.4E-09	2.6E-09	1.7E-09	9.5E-10	3.9E-10

COLLECTIVE EFFECTIVE DOSE EQUIVALENT (person rem/y)
(All Radionuclides and Pathways)

	Distance (m)						
Direction	800	2400	4000	5600	7200	8800	10800
N	2.9E-08	0.0E+00	6.6E-08	3.1E-07	1.9E-07	0.0E+00	0.0E+00
NNW	8.4E-08	0.0E+00	4.6E-07	1.2E-06	4.9E-07	1.2E-08	0.0E+00
NW	7.0E-08	0.0E+00	2.4E-06	1.9E-06	1.4E-06	1.7E-07	0.0E+00
WNW	4.2E-08	0.0E+00	0.0E+00	8.7E-07	5.2E-07	1.4E-07	1.5E-08
W	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	6.6E-08	7.9E-08
WSW	2.8E-08	0.0E+00	0.0E+00	1.7E-10	1.3E-08	7.3E-08	6.6E-08
SW	2.7E-08	0.0E+00	0.0E+00	1.2E-07	3.2E-08	1.5E-08	1.5E-07
SSW	5.6E-08	0.0E+00	0.0E+00	0.0E+00	9.4E-08	1.5E-07	9.6E-08
S	7.5E-08	0.0E+00	1.5E-10	0.0E+00	5.4E-09	2.2E-08	3.5E-08
SSE	5.5E-08	6.3E-08	5.2E-08	0.0E+00	1.0E-07	9.5E-08	1.2E-07
SE	1.2E-07	0.0E+00	2.5E-07	1.9E-07	6.2E-07	5.4E-07	9.4E-07
ESE	1.0E-07	1.4E-08	0.0E+00	1.4E-07	4.6E-07	5.4E-07	1.3E-06
E	1.7E-08	6.8E-09	1.0E-08	4.0E-08	5.4E-08	7.3E-08	3.0E-07
ENE	2.4E-07	5.8E-09	0.0E+00	0.0E+00	1.2E-08	4.8E-08	1.7E-07
NE	6.3E-08	1.6E-07	0.0E+00	2.6E-07	7.3E-08	0.0E+00	0.0E+00
NNE	3.4E-08	0.0E+00	2.4E-08	2.7E-07	5.8E-08	0.0E+00	9.7E-10

	Distance (m)					
Direction	14000	19000	25000	34000	48000	68000
N	0.0E+00	0.0E+00	1.6E-09	0.0E+00	2.6E-10	3.5E-10
NNW	0.0E+00	3.1E-08	2.3E-10	0.0E+00	4.6E-10	7.8E-09
NW	0.0E+00	8.1E-09	2.1E-07	6.8E-08	2.6E-09	6.1E-10
WNW	4.0E-07	2.3E-07	1.1E-08	1.7E-07	4.9E-08	4.5E-08
W	1.4E-07	4.2E-08	4.7E-08	5.5E-08	1.7E-07	2.7E-10
WSW	1.7E-07	1.8E-07	3.7E-08	4.2E-09	2.3E-08	1.4E-12
SW	1.4E-07	3.1E-08	7.4E-09	1.7E-09	0.0E+00	0.0E+00
SSW	8.2E-09	3.3E-09	2.2E-08	0.0E+00	0.0E+00	0.0E+00
S	1.3E-09	2.5E-08	0.0E+00	0.0E+00	0.0E+00	0.0E+00
SSE	3.5E-08	6.1E-08	2.0E-08	0.0E+00	2.6E-08	8.3E-08
SE	4.4E-07	1.5E-07	4.1E-07	3.5E-06	4.8E-06	3.0E-06
ESE	7.7E-07	1.1E-06	7.8E-07	1.8E-06	4.2E-06	1.9E-06
E	2.4E-07	5.1E-07	4.3E-07	2.7E-07	1.5E-07	5.4E-08
ENE	8.9E-08	1.9E-07	1.9E-07	9.0E-09	2.6E-09	1.5E-08
NE	7.5E-09	6.0E-08	1.1E-07	9.8E-08	1.1E-08	6.1E-08
NNE	0.0E+00	8.9E-09	3.4E-08	1.1E-08	1.7E-09	1.3E-09

AVERAGE COLLECTIVE GENETIC DOSE EQUIVALENT
(person rem)
(All Radionuclides and Pathways)

	Distance (m)						
Direction	800	2400	4000	5600	7200	8800	10800
N	8.6E-07	0.0E+00	1.9E-06	9.3E-06	5.5E-06	0.0E+00	0.0E+00
NNW	2.5E-06	0.0E+00	1.3E-05	3.7E-05	1.4E-05	3.6E-07	0.0E+00
NW	2.1E-06	0.0E+00	7.0E-05	5.6E-05	4.3E-05	5.0E-06	0.0E+00
WNW	1.2E-06	0.0E+00	0.0E+00	2.6E-05	1.5E-05	4.2E-06	4.5E-07
W	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	2.0E-06	2.3E-06
WSW	8.3E-07	0.0E+00	0.0E+00	4.9E-09	3.7E-07	2.2E-06	2.0E-06
SW	7.8E-07	0.0E+00	0.0E+00	3.6E-06	9.4E-07	4.6E-07	4.5E-06
SSW	1.7E-06	0.0E+00	0.0E+00	0.0E+00	2.8E-06	4.5E-06	2.8E-06
S	2.2E-06	0.0E+00	4.3E-09	0.0E+00	1.6E-07	6.5E-07	1.0E-06
SSE	1.6E-06	1.9E-06	1.5E-06	0.0E+00	3.1E-06	2.8E-06	3.5E-06
SE	3.6E-06	0.0E+00	7.3E-06	5.6E-06	1.8E-05	1.6E-05	2.8E-05
ESE	3.0E-06	4.0E-07	0.0E+00	4.3E-06	1.3E-05	1.6E-05	3.7E-05
E	5.0E-07	2.0E-07	3.1E-07	1.2E-06	1.6E-06	2.2E-06	9.0E-06
ENE	7.0E-06	1.7E-07	0.0E+00	0.0E+00	3.6E-07	1.4E-06	5.1E-06
NE	1.9E-06	4.7E-06	0.0E+00	7.6E-06	2.1E-06	0.0E+00	0.0E+00
NNE	1.0E-06	0.0E+00	7.2E-07	8.0E-06	1.7E-06	0.0E+00	2.9E-08

	Distance (m)					
Direction	14000	19000	25000	34000	48000	68000
N	0.0E+00	0.0E+00	4.7E-08	0.0E+00	7.8E-09	1.0E-08
NNW	0.0E+00	9.2E-07	6.9E-09	0.0E+00	1.4E-08	2.3E-07
NW	0.0E+00	2.4E-07	6.1E-06	2.0E-06	7.8E-08	1.8E-08
WNW	1.2E-05	6.9E-06	3.3E-07	4.9E-06	1.5E-06	1.3E-06
W	4.2E-06	1.2E-06	1.4E-06	1.6E-06	5.1E-06	8.1E-09
WSW	5.0E-06	5.5E-06	1.1E-06	1.2E-07	6.9E-07	4.2E-11
SW	4.1E-06	9.3E-07	2.2E-07	5.0E-08	0.0E+00	0.0E+00
SSW	2.4E-07	9.7E-08	6.6E-07	0.0E+00	0.0E+00	0.0E+00
S	3.8E-08	7.4E-07	0.0E+00	0.0E+00	0.0E+00	0.0E+00
SSE	1.0E-06	1.8E-06	5.8E-07	0.0E+00	7.6E-07	2.5E-06
SE	1.3E-05	4.5E-06	1.2E-05	1.0E-04	1.4E-04	8.8E-05
ESE	2.3E-05	3.2E-05	2.3E-05	5.5E-05	1.2E-04	5.7E-05
E	7.1E-06	1.5E-05	1.3E-05	7.9E-06	4.3E-06	1.6E-06
ENE	2.6E-06	5.6E-06	5.6E-06	2.6E-07	7.6E-08	4.5E-07
NE	2.2E-07	1.8E-06	3.2E-06	2.9E-06	3.3E-07	1.8E-06
NNE	0.0E+00	2.6E-07	1.0E-06	3.3E-07	5.1E-08	4.0E-08

INDIVIDUAL LIFETIME RISK (deaths)
(All Radionuclides and Pathways)

Direction	Distance (m) 800	2400	4000	5600	7200	8800	10800
N	3.5E-11	0.0E+00	1.7E-12	9.8E-13	6.0E-13	0.0E+00	0.0E+00
NNW	1.0E-10	0.0E+00	5.3E-12	3.1E-12	2.0E-12	1.4E-12	0.0E+00
NW	1.7E-10	0.0E+00	8.9E-12	5.2E-12	3.3E-12	2.4E-12	0.0E+00
WNW	1.0E-10	0.0E+00	0.0E+00	3.1E-12	1.9E-12	1.4E-12	9.8E-13
W	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	3.9E-13	2.7E-13
WSW	3.4E-11	0.0E+00	0.0E+00	1.0E-12	6.3E-13	4.6E-13	3.3E-13
SW	3.2E-11	0.0E+00	0.0E+00	1.0E-12	6.8E-13	5.0E-13	3.7E-13
SSW	3.4E-11	0.0E+00	0.0E+00	0.0E+00	6.5E-13	4.8E-13	3.4E-13
S	3.6E-11	0.0E+00	1.8E-12	0.0E+00	6.4E-13	4.5E-13	3.2E-13
SSE	6.7E-11	8.8E-12	3.6E-12	0.0E+00	1.4E-12	9.9E-13	7.1E-13
SE	9.7E-11	0.0E+00	5.4E-12	3.2E-12	2.1E-12	1.5E-12	1.1E-12
ESE	6.2E-11	8.2E-12	0.0E+00	2.0E-12	1.3E-12	9.2E-13	6.6E-13
E	2.7E-11	3.3E-12	1.3E-12	7.2E-13	4.3E-13	3.1E-13	2.1E-13
ENE	2.9E-11	3.5E-12	0.0E+00	0.0E+00	4.9E-13	3.5E-13	2.4E-13
NE	3.0E-11	3.8E-12	0.0E+00	8.7E-13	5.4E-13	0.0E+00	0.0E+00
NNE	3.3E-11	0.0E+00	1.6E-12	9.3E-13	5.7E-13	0.0E+00	2.9E-13

Direction	Distance (m) 14000	19000	25000	34000	48000	68000
N	0.0E+00	0.0E+00	6.3E-14	0.0E+00	2.3E-14	9.2E-15
NNW	0.0E+00	4.6E-13	2.2E-13	0.0E+00	8.4E-14	3.4E-14
NW	0.0E+00	7.8E-13	3.9E-13	2.5E-13	1.5E-13	5.9E-14
WNW	7.0E-13	4.5E-13	2.2E-13	1.4E-13	8.1E-14	3.2E-14
W	1.9E-13	1.2E-13	4.9E-14	3.1E-14	1.7E-14	5.2E-15
WSW	2.4E-13	1.5E-13	8.0E-14	5.4E-14	3.4E-14	1.7E-14
SW	2.7E-13	1.8E-13	1.0E-13	7.2E-14	0.0E+00	0.0E+00
SSW	2.5E-13	1.6E-13	8.7E-14	0.0E+00	0.0E+00	0.0E+00
S	2.3E-13	1.4E-13	0.0E+00	0.0E+00	0.0E+00	0.0E+00
SSE	5.1E-13	3.4E-13	1.7E-13	0.0E+00	6.9E-14	3.2E-14
SE	8.0E-13	5.2E-13	2.8E-13	1.8E-13	1.1E-13	5.2E-14
ESE	4.7E-13	3.1E-13	1.6E-13	1.1E-13	6.4E-14	2.9E-14
E	1.5E-13	9.2E-14	4.1E-14	2.6E-14	1.4E-14	5.0E-15
ENE	1.7E-13	1.1E-13	5.0E-14	3.2E-14	1.8E-14	7.2E-15
NE	1.9E-13	1.2E-13	6.0E-14	3.9E-14	2.2E-14	9.6E-15
NNE	0.0E+00	1.3E-13	6.2E-14	4.0E-14	2.3E-14	9.4E-15

COLLECTIVE FATAL CANCER RATE (deaths/y)
(All Radionuclides and Pathways)

	Distance (m)						
Direction	800	2400	4000	5600	7200	8800	10800
N	9.9E-12	0.0E+00	2.2E-11	1.1E-10	6.3E-11	0.0E+00	0.0E+00
NNW	2.9E-11	0.0E+00	1.6E-10	4.2E-10	1.7E-10	4.1E-12	0.0E+00
NW	2.4E-11	0.0E+00	8.1E-10	6.5E-10	4.9E-10	5.7E-11	0.0E+00
WNW	1.4E-11	0.0E+00	0.0E+00	3.0E-10	1.8E-10	4.8E-11	5.2E-12
W	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	2.2E-11	2.7E-11
WSW	9.5E-12	0.0E+00	0.0E+00	5.7E-14	4.3E-12	2.5E-11	2.3E-11
SW	9.0E-12	0.0E+00	0.0E+00	4.1E-11	1.1E-11	5.2E-12	5.2E-11
SSW	1.9E-11	0.0E+00	0.0E+00	0.0E+00	3.2E-11	5.2E-11	3.2E-11
S	2.5E-11	0.0E+00	5.0E-14	0.0E+00	1.9E-12	7.5E-12	1.2E-11
SSE	1.9E-11	2.2E-11	1.8E-11	0.0E+00	3.6E-11	3.2E-11	4.1E-11
SE	4.1E-11	0.0E+00	8.5E-11	6.4E-11	2.1E-10	1.8E-10	3.2E-10
ESE	3.5E-11	4.6E-12	0.0E+00	4.9E-11	1.6E-10	1.8E-10	4.3E-10
E	5.7E-12	2.3E-12	3.5E-12	1.4E-11	1.9E-11	2.5E-11	1.0E-10
ENE	8.1E-11	2.0E-12	0.0E+00	0.0E+00	4.1E-12	1.6E-11	5.9E-11
NE	2.1E-11	5.4E-11	0.0E+00	8.8E-11	2.5E-11	0.0E+00	0.0E+00
NNE	1.2E-11	0.0E+00	8.3E-12	9.2E-11	2.0E-11	0.0E+00	3.3E-13

	Distance (m)					
Direction	14000	19000	25000	34000	48000	68000
N	0.0E+00	0.0E+00	5.4E-13	0.0E+00	9.0E-14	1.2E-13
NNW	0.0E+00	1.1E-11	7.9E-14	0.0E+00	1.6E-13	2.7E-12
NW	0.0E+00	2.7E-12	7.0E-11	2.3E-11	8.9E-13	2.1E-13
WNW	1.4E-10	8.0E-11	3.8E-12	5.6E-11	1.7E-11	1.5E-11
W	4.9E-11	1.4E-11	1.6E-11	1.9E-11	5.9E-11	9.3E-14
WSW	5.8E-11	6.3E-11	1.3E-11	1.4E-12	8.0E-12	4.9E-16
SW	4.7E-11	1.1E-11	2.5E-12	5.7E-13	0.0E+00	0.0E+00
SSW	2.8E-12	1.1E-12	7.6E-12	0.0E+00	0.0E+00	0.0E+00
S	4.4E-13	8.6E-12	0.0E+00	0.0E+00	0.0E+00	0.0E+00
SSE	1.2E-11	2.1E-11	6.7E-12	0.0E+00	8.7E-12	2.8E-11
SE	1.5E-10	5.2E-11	1.4E-10	1.2E-09	1.6E-09	1.0E-09
ESE	2.6E-10	3.7E-10	2.7E-10	6.3E-10	1.4E-09	6.5E-10
E	8.1E-11	1.7E-10	1.4E-10	9.0E-11	5.0E-11	1.8E-11
ENE	3.0E-11	6.5E-11	6.4E-11	3.0E-12	8.7E-13	5.2E-12
NE	2.6E-12	2.0E-11	3.7E-11	3.3E-11	3.8E-12	2.1E-11
NNE	0.0E+00	3.0E-12	1.2E-11	3.8E-12	5.9E-13	4.6E-13