MMSC-EM-97016
UC-707

*Radionuclide Air Emissions
Annual Report for
Calendar Year 1997*

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Lockheed Martin Specialty Components, Inc., is the Management and Operating Contractor for the Pinellas Plant Under U.S. Department of Energy Contract No. DE-AC04-92AL73000.

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Number: MMSC-EM-97016

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The Pinellas Plant
P.O. Box 2908
Largo, Florida 33779-2908

Lockheed Martin Specialty Components, Inc., is the Management and Operating contractor for the Pinellas Plant under U.S. Department of Energy Contract No. DE-AC04-92AL73000.

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TABLE OF CONTENTS

<u>Section</u>		<u>Page</u>
1.0	Facility Information	1
1.1	Site Description	1
1.2	Source Description	2
1.3	Receptor Description	2
2.0	Air Emissions Data	4
3.0	Dose Assessments	5
3.1	Description of Dose Model	5
3.2	Summary of Input Parameters	5
4.0	Additional Information	9
4.1	Unplanned Releases	9
4.2	Diffuse Emissions	9
4.3	Supplemental Information	9
5.0	Distribution	11

Listing of Appendices

A	Tampa International Airport 1996 Annual Windrose and Wind Frequency Distribution by Windspeed, Stability Class, and Origin	A-1
B	CAP88-PC Non-Radon Individual Assessment	B-1
C	Summary of Stack Flowrate Measurements Conducted	C-1
D	CAP88-PC Non-Radon Population Assessment	D-1
E	Comply Computer Modeling Run, 1997	E-1

Listing of Figures

<u>Figure</u>		
1	Pinellas Plant Site Layout	3

Listing of Tables

<u>Table</u>		
1	Summary of Agricultural Data Inputs	6
2	Summary of Pinellas Plant Radiological Emissions Sources	6
3	Summary of Pinellas Plant Receptors	7

U. S. Department of Energy
Air Emissions Annual Report
(under Subpart H, 40 CFR 61.94)
Calendar Year 1997
for the
United States Department of Energy - Pinellas Plant

Site Name: U. S. Department of Energy - Pinellas Plant

Operations Office Information

Office: U. S. Department of Energy, Pinellas Area Office

Address: 7887 Bryan Dairy Road,
Largo, Florida 33779

Contact: David Ingle, DOE/PAO Phone: (813) 541-8943
Team Leader, Environmental, Safety and Health Programs

Site Information

Operator: Lockheed Martin Specialty Components, Inc.

1.0 FACILITY INFORMATION

1.1 Site Description

The Pinellas Plant is located on a 99-acre site in the geographic center of Pinellas County, Florida. The plant site is bordered on the east by Belcher Road, on the south by Bryan Dairy Road, and on the west by the CSX Railroad. The county is a peninsula bordered on the west by the Gulf of Mexico and on the east and south by Tampa Bay. The plant site is centrally located between the county's major municipalities of Clearwater and St. Petersburg. The coordinates of the southwest corner of the plant site are latitude 27°52.5'N, longitude 82°45'W. The topography of the area surrounding the Pinellas Plant is flat.

With a land area of 252 square miles and a resident population of 882,982, based on the 1990 Census estimate, Pinellas County is the most densely populated county in Florida (approximately 3,100 persons per square mile). The total 1990 population within a 50-mile radius of the Pinellas Plant is 2,529,869.

The climate of Pinellas County is subtropical with a mean annual temperature of 71.7°F (22.1°C). The 1996 annual precipitation at the Pinellas Plant was 49.4 inches (126.0 cm) as measured by the meteorological station at Tampa International Airport. Prevailing winds are from the east to northeast.

During 1997, the Pinellas Plant was operated by Lockheed Martin Specialty Components, Inc., (Specialty Components) for the United States Department of Energy (DOE). The primary Defense Programs (DP) mission ended on October 1, 1994. The Pinellas Plant previously housed manufacturing operations for components for the nation's nuclear weapons complex. Products produced at the plant site included neutron generators and detectors, vacuum switch tubes, electromagnetic devices, capacitors, thermal batteries, frequency control devices, quartz digital accelerometers, lightning arrester connectors, ceramics, and foam support pads.

The DOE sold the Pinellas Plant to the Pinellas County Industry Council (PCIC) in March 1995. A portion of the plant site was leased back by the DOE until September 30, 1997, to facilitate a safe transition to commercial ventures. Tritium is not used in the production processes for these new commercial products. The plant's radiological processing equipment was cleaned up from past DOE operations. Emissions from the cleanup activity were monitored. After all radiological sources were removed, the exhaust ducts and stacks were also

removed, and the Environmental Protection Agency (EPA) was notified through routine reporting.

1.2 Source Description

In 1997, there were two point sources of radiological emissions at the Pinellas Plant: the Building 800 stack and the Analytical Laboratory stack located on Building 100 (roof opening 489). By the end of July, all of the tritium sources exhausting to the Building 800 stack and all of the exhaust ducts and the stack itself were removed. By the end of August, all of the tritium sources exhausting to roof opening 489 were terminated.

During 1997, the Building 800 stack exhausted tritium gas and oxide emissions from radioactive waste repackaging operations. The Building 100 roof opening 489 exhausted tritium from environmental radioanalytical processes.

1.3 Receptor Description

The PCIC (the new owner of the Pinellas Plant) is leasing portions of the plant to commercial tenants. These tenants have set up commercial operations in portions of Building 100, Building 200, Building 400, Building 1200, and Building 1400 (see Figure 1). For modeling purposes, these tenants were considered as on-site receptors.

Pinellas Plant Site

Figure 1. Pinellas Plant Site Layout

2.0 AIR EMISSIONS DATA

<u>Point Source</u>	<u>Type Control</u>	<u>Efficiency</u>	<u>Distance to Nearest Receptor*</u>
Building 800 Stack	Uncontrolled	0%	100 Meters
Building 100 Roof Opening 489	Uncontrolled	0%	100 Meters

* Distance Provided is the distance to the nearest off-site residence or on-site tenant.

All sources are monitored and sampled for radionuclide releases.

Grouped Source:

None

<u>Point Source Radionuclide</u>	<u>CY 1997 Annual Quantity Curies (Ci)</u>	<u>Becquerels (Bq)</u>
Tritium Gas	0	0
Tritium Oxide	3.3	1.22E+11
Krypton-85 Gas	<u>0</u>	<u>0</u>
Total 1997 Emissions	3.3	1.22E+11

Non-Point Source:

None

3.0 DOSE ASSESSMENTS

3.1 Description of Dose Model

CAP88-PC Version 1.0 was used to determine the Effective Dose Equivalent (EDE) to the most exposed member of the public and to calculate the collective population dose. This model received the EPA's approval for DOE's use in demonstrating compliance with radiological dose standards. CAP88-PC assumes a most conservative case scenario where all tritium emissions are in the oxide form, which is approximately 25,000 times more biologically reactive than tritium gas. There were no area sources of emissions at the Pinellas Plant; therefore, all emissions that were modeled were stack emissions. Actual distances to the nearest on- or off-site receptors were used because distance to the Maximally Exposed Individual (MEI), estimated by CAP88-PC for the location of highest risk, was not where an individual actually resided. Local residences were where an individual could potentially be exposed 24 hours a day, 365 days a year, and ingest locally grown vegetables and meat.

3.2 Summary of Input Parameters

During 1994, a comprehensive study comparing data from the Pinellas Plant on-site meteorological station, Tampa International Airport (TIA), and St. Petersburg International Airport was conducted. The study reviewed the meteorological data set collected at the DOE site and concluded that all the parameters measured and the calculated data were very representative of the data collected at the TIA site. The data from the St. Petersburg location were somewhat less representative. The study determined that the TIA data were of sufficient quality and completeness to be used for air quality modeling applications, thus confirming the use of the data for tasks such as Annual National Emissions Standards for Hazardous Air Pollutants (NESHAP) Radionuclide Air Emissions Report or other air dispersion modeling requirements.

With the DOE's Pinellas Area Office personnel's concurrence, 1996 weather data were used to facilitate the preparation of this report prior to the termination of Specialty Components operating and maintenance contract, the completion of plant cleanup activities, and the safe transition of the remaining plant areas by September 30, 1997. Meteorological data collected at Tampa International Airport during 1996 were used to prepare a standard Stability Array (STAR) meteorological input file (Appendix A). This input file was transformed into a *.WIND file by using the CAP88-PC's GETWIND utility to generate the site specific meteorological input file for the model run. Specific input values for 1996

were a mean annual temperature of 22°C and a total annual rainfall of 126 centimeters. A mean mixing height of 1500 meters was used in both individual and cumulative modeling scenarios. CAP88-PC default input values were used as source inputs, where prescribed.

Input file parameters for the agricultural data, radiological emission point sources, and Pinellas Plant receptor inputs are provided in the following tables.

Table 1. Summary of Agricultural Data Inputs

	Vegetable	Milk	Meat
Fraction Home Produced	0.076	0.000	0.008
Fraction From Assessment Area:	0.924	1.000	0.992
Fraction Imported:	0.000	0.000	0.000

Table 2. Summary of Pinellas Plant Radiological Emission Sources

Source	Total Tritium* (Curies)	Kr-85 (Curies)	Stack Height (Meters)	Stack Diameter (Meters)	Stack Velocity (Meters/sec)
Building 800 Stack	3.3	0	9.14	0.51	3.3
Building 100 Roof Opening #489	0.0005	N/A	11.09	0.43	12.8

* Tritium Oxide

N/A - Kr-85 was not emitted from this source

Table 3. Summary of Pinellas Plant Receptors

Receptor	Direction	Distance meters	Effective Dose (mrem/yr)	Effective Dose (mSv/yr)
Apartment	WSW	620	3.9E-03	3.9E-05
Building 400	NW	325	2.9E-03	2.9E-05
Manufacturing Company	NNE	553	2.6E-03	2.6E-05
Manufacturing Company	SW	228	2.9E-03	2.9E-05
Building 200	N	100	3.9E-03	3.9E-05
New Directions In Learning Partnership School	ENE	200	3.3E-03	3.3E-05
Calculated Most Exposed Individual	E	100	5.14E-03	5.14E-05

Effective Dose Equivalent: 5.14E-03 mrem /yr

Location of MEI:

As determined by the model, the location of the MEI was 100 meters east of Building 100; however, there were no full time residents at this location. The individual EDEs listed in Table 3 were taken from the CAP88-PC Dose and Risk Equivalent Summary Report (Appendix B). The doses listed in the table included all radionuclides and all pathways.

NESHAP compliance was determined through dispersion modeling of radionuclide emissions with the EPA's CAP88-PC computer model Version 1.0. The results of the modeling confirmed that the facility was in compliance with the EPA's 10 millirem per year exposure limit.

Certifications

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)

Name: David Ingle, Team Leader, Environmental, Safety and Health Programs
Pinellas Area Office, U.S. DOE

Signature:

A handwritten signature in dark ink, appearing to read "David I. Ingle", is written over a horizontal line.

Date:

A handwritten date "8/22/97" is written over a horizontal line.

4.0 ADDITIONAL INFORMATION

The plant actively underwent a formalized transition process that involved the termination and transfer of radionuclide processes and equipment from the Pinellas Plant to other DOE sites. The only radionuclide emissions in 1997 were from plant decontamination activities. By August 30, 1997, all DOE radionuclide processing equipment and the Building 800 exhaust stack were removed from the Pinellas Plant. Roof opening 489 remained in place for use by a commercial tenant.

Plant decontamination activities did not result in an increase in annual radiological emissions or resultant dose to the public, and the Pinellas Plant compliance status, with respect to 1% of the 10 mrem/yr standard, was not affected. The Building 800 exhaust stack and roof opening 489 emissions were sampled during 1997, to verify the low estimated emissions.

4.1 Unplanned Releases

There were no unplanned releases in 1997.

4.2 Diffuse Emissions

The Pinellas Plant had no known sources of diffuse emissions.

4.3 Supplemental Information

1997 Collective Effective Dose Equivalent (Person-rem/year)

Plant personnel estimated the 1997 collective population dose to be 2.57E-02 person-rem/year, based on the CAP88-PC modeling results, using 1997 emissions data. The CAP88-PC cumulative population dose calculation modeling output file is included as Appendix D of this report. The population distribution within a 50-mile radius of the Pinellas Plant was obtained from a study entitled Population Density Within A Fifty-Mile Radius Of The Department Of Energy Pinellas Plant, written by Dr. W.E. Bolch in April 1992.

Status of Compliance with Subpart Q and T of 40 CFR 61

Subpart Q and T do not apply because byproduct material or uranium mill tailings were not stored or disposed at the Pinellas Plant.

Information on Rn-220 Emissions from Sources Containing U-232 and Th-232

There were no Rn-220 sources at the Pinellas Plant.

Information on Rn-222 Emissions

There were no Rn-222 sources at the Pinellas Plant.

Status of Compliance with NESHAP Monitoring Requirements

On March 24, 1992, the EPA documented its review and approval of a COMPLY computer model run, using a most conservative case emissions scenario, which projected the EDE of 0.082 mrem/yr to the MEI and classified the Building 100 main stack as a minor radionuclide release point. In December 1992, the Pinellas Plant submitted a radionuclide emissions minor source certification report for 1992 to the EPA. It included an EPA-approved COMPLY computer model run, using a most conservative case emissions scenario; i.e., the TRS was assumed to be nonoperational and subsequently all tritium processed was released uncontrolled. The TRS normally removed 99% of all tritium, prior to discharge, through the Building 100 main stack.

For 1997, another COMPLY modeling run was conducted using the scenario where all tritium was exhausted from the Building 800 stack and 1996 TIA meteorological data (Appendix E). The report documented that even under the most conservative case simulation, the dose was 0.001 mrem/yr, which was below the 0.1 mrem/yr EPA standard. This verified that the plant was a minor source of radionuclide emissions and was not required to continuously monitor and sample the radiological exhaust stacks. As a result of the termination of DOE radionuclide emissions, the stack sampling program ceased.

The flowrates of the two radiological exhaust stacks that were in operation during 1997 were measured on February 27, 1997, according to EPA's Method 1 and Method 2 requirements (Appendix C). These flowrates and corresponding velocities were used in the CAP88-PC modeling run.

Because the DOE's radiological emissions terminated on September 30, 1997, this calendar year 1997 Radionuclide Air Emissions Annual Report constitutes the final report for the Pinellas Plant facility.

5.0 DISTRIBUTION

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APPENDIX A

Tampa International Airport 1996 Annual Windrose and Wind Frequency Distribution by Windspeed, Stability Class, and Origin

SCALE (KNOTS)

1-3 4-6 7-10 11-16 17-21 >21

TAMPA INTERNATIONAL AP
WINDROSE
ANNUAL 1996

Pinellas Plant 1996 Annual Windrose

1996 Wind Frequency Distribution at Tampa International Airport

Wind Origin	Pasquill- Gifford Stability Class	Wind Speed In Knots					
		1-3	4-6	7-10	11-16	17-21	>21
N	A	0.00023	0.00046	0.00000	0.00000	0.00000	0.00000
NNE	A	0.00029	0.00023	0.00000	0.00000	0.00000	0.00000
NE	A	0.00023	0.00046	0.00000	0.00000	0.00000	0.00000
ENE	A	0.00035	0.00068	0.00000	0.00000	0.00000	0.00000
E	A	0.00115	0.00091	0.00000	0.00000	0.00000	0.00000
ESE	A	0.00070	0.00103	0.00000	0.00000	0.00000	0.00000
SE	A	0.00040	0.00046	0.00000	0.00000	0.00000	0.00000
SSE	A	0.00006	0.00011	0.00000	0.00000	0.00000	0.00000
S	A	0.00035	0.00068	0.00000	0.00000	0.00000	0.00000
SSW	A	0.00040	0.00046	0.00000	0.00000	0.00000	0.00000
SW	A	0.00087	0.00137	0.00000	0.00000	0.00000	0.00000
WSW	A	0.00128	0.00216	0.00000	0.00000	0.00000	0.00000
W	A	0.00047	0.00091	0.00000	0.00000	0.00000	0.00000
WNW	A	0.00012	0.00023	0.00000	0.00000	0.00000	0.00000
NW	A	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
NNW	A	0.00017	0.00000	0.00000	0.00000	0.00000	0.00000
N	B	0.00060	0.00205	0.00148	0.00000	0.00000	0.00000
NNE	B	0.00069	0.00171	0.00114	0.00000	0.00000	0.00000
NE	B	0.00103	0.00137	0.00125	0.00000	0.00000	0.00000
ENE	B	0.00200	0.00330	0.00353	0.00000	0.00000	0.00000
E	B	0.00239	0.00455	0.00239	0.00000	0.00000	0.00000
ESE	B	0.00162	0.00330	0.00262	0.00000	0.00000	0.00000
SE	B	0.00132	0.00285	0.00285	0.00000	0.00000	0.00000
SSE	B	0.00046	0.00194	0.00114	0.00000	0.00000	0.00000
S	B	0.00101	0.00353	0.00319	0.00000	0.00000	0.00000
SSW	B	0.00100	0.00342	0.00216	0.00000	0.00000	0.00000
SW	B	0.00114	0.00581	0.00558	0.00000	0.00000	0.00000
WSW	B	0.00198	0.00774	0.00774	0.00000	0.00000	0.00000
W	B	0.00168	0.00615	0.01048	0.00000	0.00000	0.00000
WNW	B	0.00021	0.00080	0.00080	0.00000	0.00000	0.00000
NW	B	0.00006	0.00057	0.00023	0.00000	0.00000	0.00000

Wind Origin	Pasquill- Gifford Stability Class	Wind Speed In Knots					
		1-3	4-6	7-10	11-16	17-21	>21
NNW	B	0.00092	0.00148	0.00068	0.00000	0.00000	0.00000
N	C	0.00011	0.00205	0.00285	0.00091	0.00000	0.00000
NNE	C	0.00034	0.00182	0.00524	0.00034	0.00000	0.00000
NE	C	0.00014	0.00262	0.00501	0.00000	0.00000	0.00000
ENE	C	0.00071	0.00421	0.00774	0.00034	0.00000	0.00000
E	C	0.00174	0.00774	0.00888	0.00080	0.00000	0.00000
ESE	C	0.00024	0.00228	0.00683	0.00034	0.00000	0.00000
SE	C	0.00052	0.00285	0.00729	0.00068	0.00000	0.00000
SSE	C	0.00025	0.00239	0.00444	0.00068	0.00000	0.00000
S	C	0.00062	0.00251	0.00672	0.00171	0.00000	0.00000
SSW	C	0.00027	0.00273	0.00581	0.00148	0.00000	0.00000
SW	C	0.00044	0.00364	0.00285	0.00080	0.00000	0.00000
WSW	C	0.00057	0.00376	0.00706	0.00148	0.00000	0.00000
W	C	0.00059	0.00421	0.02027	0.00490	0.00000	0.00000
WNW	C	0.00009	0.00171	0.00569	0.00194	0.00000	0.00011
NW	C	0.00005	0.00091	0.00364	0.00046	0.00000	0.00000
NNW	C	0.00027	0.00046	0.00547	0.00103	0.00000	0.00000
N	D	0.00001	0.00080	0.00638	0.01036	0.00091	0.00000
NNE	D	0.00001	0.00057	0.00786	0.00558	0.00034	0.00000
NE	D	0.00001	0.00125	0.00512	0.00273	0.00000	0.00000
ENE	D	0.00003	0.00296	0.00740	0.00490	0.00023	0.00000
E	D	0.00003	0.00319	0.00706	0.00421	0.00080	0.00000
ESE	D	0.00002	0.00182	0.00307	0.00182	0.00000	0.00000
SE	D	0.00001	0.00103	0.00364	0.00182	0.00011	0.00000
SSE	D	0.00002	0.00171	0.00228	0.00114	0.00000	0.00000
S	D	0.00002	0.00228	0.00854	0.00467	0.00046	0.00023
SSW	D	0.00002	0.00148	0.00433	0.00524	0.00046	0.00023
SW	D	0.00001	0.00046	0.00262	0.00194	0.00000	0.00011
WSW	D	0.00002	0.00159	0.00399	0.00216	0.00000	0.00000
W	D	0.00002	0.00148	0.00524	0.00421	0.00023	0.00034
WNW	D	0.00000	0.00034	0.00353	0.00353	0.00148	0.00046

Wind Origin	Pasquill- Gifford Stability Class	Wind Speed In Knots					
		1-3	4-6	7-10	11-16	17-21	>21
NW	D	0.00001	0.00080	0.00387	0.00808	0.00239	0.00034
NNW	D	0.00001	0.00091	0.00569	0.01104	0.00216	0.00011
N	E	0.00000	0.00353	0.00934	0.00000	0.00000	0.00000
NNE	E	0.00000	0.00239	0.01013	0.00000	0.00000	0.00000
NE	E	0.00000	0.00433	0.00421	0.00000	0.00000	0.00000
ENE	E	0.00000	0.01104	0.00410	0.00000	0.00000	0.00000
E	E	0.00000	0.00934	0.00717	0.00000	0.00000	0.00000
ESE	E	0.00000	0.00455	0.00843	0.00000	0.00000	0.00000
SE	E	0.00000	0.00592	0.00467	0.00000	0.00000	0.00000
SSE	E	0.00000	0.00353	0.00216	0.00000	0.00000	0.00000
S	E	0.00000	0.00433	0.00501	0.00000	0.00000	0.00000
SSW	E	0.00000	0.00091	0.00296	0.00000	0.00000	0.00000
SW	E	0.00000	0.00285	0.00285	0.00000	0.00000	0.00000
WSW	E	0.00000	0.00137	0.00364	0.00000	0.00000	0.00000
W	E	0.00000	0.00239	0.00581	0.00000	0.00000	0.00000
WNW	E	0.00000	0.00114	0.00296	0.00000	0.00000	0.00000
NW	E	0.00000	0.00216	0.00342	0.00000	0.00000	0.00000
NNW	E	0.00000	0.00125	0.00581	0.00000	0.00000	0.00000
N	F	0.01426	0.01503	0.00000	0.00000	0.00000	0.00000
NNE	F	0.00721	0.00672	0.00000	0.00000	0.00000	0.00000
NE	F	0.01641	0.01560	0.00000	0.00000	0.00000	0.00000
ENE	F	0.03705	0.02664	0.00000	0.00000	0.00000	0.00000
E	F	0.03503	0.02402	0.00000	0.00000	0.00000	0.00000
ESE	F	0.01114	0.01366	0.00000	0.00000	0.00000	0.00000
SE	F	0.00976	0.01104	0.00000	0.00000	0.00000	0.00000
SSE	F	0.00857	0.00615	0.00000	0.00000	0.00000	0.00000
S	F	0.01061	0.01116	0.00000	0.00000	0.00000	0.00000
SSW	F	0.00448	0.00512	0.00000	0.00000	0.00000	0.00000
SW	F	0.00401	0.00319	0.00000	0.00000	0.00000	0.00000
WSW	F	0.00331	0.00501	0.00000	0.00000	0.00000	0.00000
W	F	0.00531	0.00638	0.00000	0.00000	0.00000	0.00000

Wind Origin	Pasquill- Gifford Stability Class	Wind Speed In Knots					
		1-3	4-6	7-10	11-16	17-21	>21
WNW	F	0.00290	0.00478	0.00000	0.00000	0.00000	0.00000
NW	F	0.00750	0.00706	0.00000	0.00000	0.00000	0.00000
NNW	F	0.00748	0.01173	0.00000	0.00000	0.00000	0.00000

APPENDIX B

CAP88 - PC

Non-Radon Individual Assessment

CAP88-PC

Version 1.00

Clean Air Act Assessment Package - 1988

SYNOPSIS REPORT

Non-Radon Individual Assessment

Jul 13, 1997, 4:17 p.m.

Facility: US DEPARTMENT OF ENERGY PINELLAS PLANT
Address: P.O. Box 2900
7887 Bryan Dairy Road
City: Largo
State: FL Zip: 33779-2900

Effective Dose Equivalent
(mrem/year)

5.14E-03

At This Location: 100 Meters East
Source Category: POINT
Source Type: Stack
Emission Year: 1997
Comments: INDIVIDUAL RUN ANNUAL NESHAP REPORT 7/97
Dataset Name: 1997indiv
Dataset Date: Jul 13, 1997, 4:15 p.m.
Wind File: WNDFILES\TPA96.WND

MAXIMALLY EXPOSED INDIVIDUAL

Location Of The Individual: 100 Meters East

Lifetime Fatal Cancer Risk: 1.40E-07

ORGAN DOSE EQUIVALENT SUMMARY

Organ	Dose Equivalent (mrem/y)
GONADS	4.89E-03
BREAST	4.89E-03
R MAR	4.86E-03
LUNGS	4.91E-03
THYROID	4.87E-03
ENDOST	3.86E-03
RMNDR	5.83E-03
EFFEC	5.14E-03

RADIONUCLIDE EMISSIONS DURING THE YEAR 1997

Nuclide	Class	Size	Source #1 Ci/y	Source #2 Ci/y	TOTAL Ci/y
H-3	*	0.00	3.3E+00	5.0E-04	3.3E+00
KR-85	*	0.00	0.0E+00	0.0E+00	0.0E+00

SITE INFORMATION

Temperature: 22 degrees C
Precipitation: 126 cm/y
Mixing Height: 1500 m

SOURCE INFORMATION

Source Number:	1	2
Stack Height (m):	9.14	11.09
Diameter (m):	0.51	0.43
Plume Rise		
Momentum (m/s): (Exit Velocity)	3.30E+00	1.28E+01

AGRICULTURAL DATA

	Vegetable	Milk	Meat
Fraction Home Produced:	0.076	0.000	0.008
Fraction From Assessment Area:	0.924	1.000	0.992
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

100	200	228	260	276	325	358	390	423	553
620	1040	2000	3000	4000	5000	6000	7000	8000	9000

CAP88-PC

Version 1.00

Clean Air Act Assessment Package - 1988

DOSE AND RISK EQUIVALENT SUMMARIES

Non-Radon Individual Assessment

Jul 13, 1997, 4:17 p.m.

Facility: US DEPARTMENT OF ENERGY PINELLAS PLANT
Address: P.O. Box 2900
7887 Bryan Dairy Road
City: Largo
State: FL Zip: 33779-2900
Source Category: POINT
Source Type: Stack
Emission Year: 1997
Comments: INDIVIDUAL RUN ANNUAL NESHAP REPORT 7/97
Dataset Name: 1997indiv
Dataset Date: Jul 13, 1997 4:15 p.m.
Wind File: WNDFILES\TPA96.WND

ORGAN DOSE EQUIVALENT SUMMARY

Organ	Selected Individual (mrem/y)
GONADS	4.89E-03
BREAST	4.89E-03
R MAR	4.86E-03
LUNGS	4.91E-03
THYROID	4.87E-03
ENDOST	3.86E-03
RMNDR	5.83E-03
EFFEC	5.14E-03

PATHWAY EFFECTIVE DOSE EQUIVALENT SUMMARY

Pathway	Selected Individual (mrem/y)
INGESTION	2.92E-03
INHALATION	2.22E-03
AIR IMMERSION	0.00E+00
GROUND SURFACE	0.00E+00
INTERNAL	5.14E-03
EXTERNAL	0.00E+00
TOTAL	5.14E-03

NUCLIDE EFFECTIVE DOSE EQUIVALENT SUMMARY

Nuclide	Selected Individual (mrem/y)
H-3	5.14E-03
KR-85	0.00E+00
TOTAL	5.14E-03

CANCER RISK SUMMARY

Cancer	Selected Individual Total Lifetime Fatal Cancer Risk
LEUKEMIA	1.54E-08
BONE	6.84E-10
THYROID	2.22E-09
BREAST	1.92E-08
LUNG	2.44E-08
STOMACH	1.86E-08
BOWEL	1.01E-08
LIVER	1.71E-08
PANCREAS	1.16E-08
URINARY	6.34E-09
OTHER	1.42E-08
TOTAL	1.40E-07

PATHWAY RISK SUMMARY

Pathway	Selected Individual Total Lifetime Fatal Cancer Risk
INGESTION	7.90E-08
INHALATION	6.07E-08
AIR IMMERSION	0.00E+00
GROUND SURFACE	0.00E+00
INTERNAL	1.40E-07
EXTERNAL	0.00E+00
TOTAL	1.40E-07

NUCLIDE RISK SUMMARY

Nuclide	Selected Individual Total Lifetime Fatal Cancer Risk
H-3	1.40E-07
KR-85	0.00E+00
TOTAL	1.40E-07

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

Direction	Distance (m)						
	100	200	228	260	276	325	358
N	3.9E-03	3.2E-03	3.1E-03	3.1E-03	3.1E-03	3.0E-03	3.0E-03
NNW	3.1E-03	2.8E-03	2.7E-03	2.7E-03	2.7E-03	2.7E-03	2.7E-03
NW	3.7E-03	3.1E-03	3.0E-03	3.0E-03	2.9E-03	2.9E-03	2.9E-03
WNW	3.8E-03	3.1E-03	3.0E-03	3.0E-03	3.0E-03	3.0E-03	3.0E-03
W	5.0E-03	3.8E-03	3.7E-03	3.7E-03	3.7E-03	3.8E-03	3.9E-03
WSW	4.3E-03	3.5E-03	3.5E-03	3.5E-03	3.6E-03	3.7E-03	3.9E-03
SW	3.3E-03	2.9E-03	2.9E-03	2.9E-03	2.9E-03	3.0E-03	3.1E-03
SSW	3.4E-03	3.0E-03	2.9E-03	2.9E-03	2.9E-03	2.8E-03	2.8E-03
S	3.3E-03	3.0E-03	3.0E-03	3.0E-03	3.0E-03	3.1E-03	3.1E-03
SSE	3.3E-03	2.9E-03	2.9E-03	2.8E-03	2.8E-03	2.8E-03	2.8E-03
SE	2.8E-03	2.7E-03	2.7E-03	2.7E-03	2.7E-03	2.7E-03	2.7E-03
ESE	3.0E-03	2.7E-03	2.6E-03	2.6E-03	2.6E-03	2.6E-03	2.5E-03
E	5.1E-03	3.6E-03	3.4E-03	3.2E-03	3.2E-03	3.0E-03	3.0E-03
ENE	4.7E-03	3.3E-03	3.1E-03	3.0E-03	2.9E-03	2.8E-03	2.8E-03
NE	3.9E-03	3.0E-03	2.9E-03	2.8E-03	2.8E-03	2.7E-03	2.7E-03
NNE	3.6E-03	2.9E-03	2.8E-03	2.8E-03	2.7E-03	2.7E-03	2.7E-03

Direction	Distance (m)						
	390	423	553	620	1040	2000	3000
N	3.0E-03	3.0E-03	2.9E-03	2.9E-03	2.6E-03	2.4E-03	2.3E-03
NNW	2.7E-03	2.7E-03	2.7E-03	2.7E-03	2.5E-03	2.3E-03	2.3E-03
NW	2.9E-03	2.9E-03	2.9E-03	2.8E-03	2.6E-03	2.4E-03	2.3E-03
WNW	3.0E-03	3.0E-03	2.9E-03	2.9E-03	2.6E-03	2.4E-03	2.3E-03
W	4.0E-03	4.0E-03	3.9E-03	3.8E-03	3.2E-03	2.6E-03	2.4E-03
WSW	3.9E-03	4.0E-03	4.0E-03	3.9E-03	3.2E-03	2.6E-03	2.4E-03
SW	3.1E-03	3.1E-03	3.1E-03	3.0E-03	2.7E-03	2.4E-03	2.3E-03
SSW	2.8E-03	2.8E-03	2.7E-03	2.7E-03	2.5E-03	2.3E-03	2.3E-03
S	3.1E-03	3.1E-03	3.1E-03	3.0E-03	2.7E-03	2.4E-03	2.3E-03
SSE	2.8E-03	2.8E-03	2.8E-03	2.7E-03	2.5E-03	2.3E-03	2.3E-03
SE	2.7E-03	2.7E-03	2.7E-03	2.6E-03	2.5E-03	2.3E-03	2.3E-03
ESE	2.5E-03	2.5E-03	2.5E-03	2.5E-03	2.4E-03	2.3E-03	2.3E-03
E	2.9E-03	2.9E-03	2.7E-03	2.7E-03	2.5E-03	2.3E-03	2.3E-03
ENE	2.7E-03	2.7E-03	2.6E-03	2.5E-03	2.4E-03	2.3E-03	2.3E-03
NE	2.6E-03	2.6E-03	2.5E-03	2.5E-03	2.4E-03	2.3E-03	2.3E-03
NNE	2.7E-03	2.6E-03	2.6E-03	2.5E-03	2.4E-03	2.3E-03	2.3E-03

INDIVIDUAL EFFECTIVE DOSE EQUIVALENT RATE (mrem/y)

(All Radionuclides and Pathways)

Direction	Distance (m)					
	4000	5000	6000	7000	8000	9000
N	2.3E-03	2.3E-03	2.3E-03	2.3E-03	2.3E-03	2.3E-03
NNW	2.3E-03	2.3E-03	2.3E-03	2.3E-03	2.2E-03	2.2E-03
NW	2.3E-03	2.3E-03	2.3E-03	2.3E-03	2.3E-03	2.2E-03
WNW	2.3E-03	2.3E-03	2.3E-03	2.3E-03	2.3E-03	2.3E-03
W	2.4E-03	2.3E-03	2.3E-03	2.3E-03	2.3E-03	2.3E-03
WSW	2.4E-03	2.3E-03	2.3E-03	2.3E-03	2.3E-03	2.3E-03
SW	2.3E-03	2.3E-03	2.3E-03	2.3E-03	2.3E-03	2.3E-03
SSW	2.3E-03	2.3E-03	2.3E-03	2.3E-03	2.2E-03	2.2E-03
S	2.3E-03	2.3E-03	2.3E-03	2.3E-03	2.3E-03	2.3E-03
SSE	2.3E-03	2.3E-03	2.3E-03	2.3E-03	2.2E-03	2.2E-03
SE	2.3E-03	2.3E-03	2.3E-03	2.2E-03	2.2E-03	2.2E-03
ESE	2.3E-03	2.2E-03	2.2E-03	2.2E-03	2.2E-03	2.2E-03
E	2.3E-03	2.3E-03	2.3E-03	2.2E-03	2.2E-03	2.2E-03
ENE	2.3E-03	2.2E-03	2.2E-03	2.2E-03	2.2E-03	2.2E-03
NE	2.3E-03	2.2E-03	2.2E-03	2.2E-03	2.2E-03	2.2E-03
NNE	2.3E-03	2.3E-03	2.2E-03	2.2E-03	2.2E-03	2.2E-03

INDIVIDUAL LIFETIME RISK (deaths)

(All Radionuclides and Pathways)

Direction	Distance (m)						
	100	200	228	260	276	325	358
N	1.1E-07	8.8E-08	8.5E-08	8.3E-08	8.3E-08	8.2E-08	8.2E-08
NNW	8.4E-08	7.5E-08	7.3E-08	7.3E-08	7.3E-08	7.3E-08	7.3E-08
NW	1.0E-07	8.3E-08	8.1E-08	8.0E-08	8.0E-08	8.0E-08	8.0E-08
WNW	1.0E-07	8.4E-08	8.3E-08	8.2E-08	8.1E-08	8.2E-08	8.2E-08
W	1.4E-07	1.0E-07	1.0E-07	1.0E-07	1.0E-07	1.0E-07	1.1E-07
WSW	1.2E-07	9.6E-08	9.5E-08	9.5E-08	9.7E-08	1.0E-07	1.0E-07
SW	8.9E-08	7.9E-08	7.8E-08	7.9E-08	7.9E-08	8.1E-08	8.3E-08
SSW	9.1E-08	8.1E-08	8.0E-08	7.8E-08	7.8E-08	7.7E-08	7.7E-08
S	9.0E-08	8.2E-08	8.1E-08	8.1E-08	8.1E-08	8.3E-08	8.3E-08
SSE	9.0E-08	8.0E-08	7.8E-08	7.7E-08	7.7E-08	7.7E-08	7.7E-08
SE	7.7E-08	7.3E-08	7.2E-08	7.2E-08	7.2E-08	7.3E-08	7.3E-08
ESE	8.1E-08	7.3E-08	7.1E-08	7.0E-08	7.0E-08	6.9E-08	6.9E-08
E	1.4E-07	9.8E-08	9.2E-08	8.7E-08	8.6E-08	8.2E-08	8.0E-08
ENE	1.3E-07	8.9E-08	8.4E-08	8.1E-08	7.9E-08	7.6E-08	7.5E-08
NE	1.1E-07	8.1E-08	7.8E-08	7.5E-08	7.5E-08	7.3E-08	7.2E-08
NNE	9.8E-08	8.0E-08	7.7E-08	7.5E-08	7.4E-08	7.3E-08	7.2E-08

Direction	Distance (m)						
	390	423	553	620	1040	2000	3000
N	8.2E-08	8.1E-08	7.9E-08	7.7E-08	7.0E-08	6.4E-08	6.2E-08
NNW	7.3E-08	7.4E-08	7.3E-08	7.2E-08	6.7E-08	6.3E-08	6.2E-08
NW	8.0E-08	7.9E-08	7.7E-08	7.6E-08	6.9E-08	6.4E-08	6.2E-08
WNW	8.2E-08	8.2E-08	8.0E-08	7.8E-08	7.0E-08	6.4E-08	6.3E-08
W	1.1E-07	1.1E-07	1.1E-07	1.0E-07	8.6E-08	7.1E-08	6.6E-08
WSW	1.1E-07	1.1E-07	1.1E-07	1.1E-07	8.7E-08	7.1E-08	6.6E-08
SW	8.4E-08	8.4E-08	8.4E-08	8.2E-08	7.3E-08	6.5E-08	6.3E-08
SSW	7.6E-08	7.6E-08	7.4E-08	7.3E-08	6.7E-08	6.3E-08	6.2E-08
S	8.4E-08	8.4E-08	8.3E-08	8.1E-08	7.2E-08	6.5E-08	6.3E-08
SSE	7.7E-08	7.7E-08	7.5E-08	7.4E-08	6.8E-08	6.3E-08	6.2E-08
SE	7.3E-08	7.3E-08	7.2E-08	7.1E-08	6.7E-08	6.3E-08	6.2E-08
ESE	6.9E-08	6.8E-08	6.7E-08	6.6E-08	6.4E-08	6.2E-08	6.1E-08
E	7.9E-08	7.8E-08	7.4E-08	7.3E-08	6.7E-08	6.3E-08	6.2E-08
ENE	7.4E-08	7.3E-08	7.0E-08	6.9E-08	6.5E-08	6.2E-08	6.1E-08
NE	7.1E-08	7.1E-08	6.9E-08	6.8E-08	6.4E-08	6.2E-08	6.1E-08
NNE	7.2E-08	7.1E-08	7.0E-08	6.9E-08	6.5E-08	6.2E-08	6.1E-08

INDIVIDUAL LIFETIME RISK (deaths)

(All Radionuclides and Pathways)

Direction	Distance (m)					
	4000	5000	6000	7000	8000	9000
N	6.2E-08	6.1E-08	6.1E-08	6.1E-08	6.1E-08	6.1E-08
NNW	6.1E-08	6.1E-08	6.1E-08	6.1E-08	6.1E-08	6.1E-08
NW	6.2E-08	6.1E-08	6.1E-08	6.1E-08	6.1E-08	6.1E-08
WNW	6.2E-08	6.1E-08	6.1E-08	6.1E-08	6.1E-08	6.1E-08
W	6.4E-08	6.3E-08	6.3E-08	6.2E-08	6.2E-08	6.2E-08
WSW	6.4E-08	6.3E-08	6.3E-08	6.2E-08	6.2E-08	6.2E-08
SW	6.2E-08	6.2E-08	6.1E-08	6.1E-08	6.1E-08	6.1E-08
SSW	6.1E-08	6.1E-08	6.1E-08	6.1E-08	6.1E-08	6.1E-08
S	6.2E-08	6.2E-08	6.1E-08	6.1E-08	6.1E-08	6.1E-08
SSE	6.1E-08	6.1E-08	6.1E-08	6.1E-08	6.1E-08	6.1E-08
SE	6.1E-08	6.1E-08	6.1E-08	6.1E-08	6.1E-08	6.1E-08
ESE	6.1E-08	6.1E-08	6.1E-08	6.1E-08	6.1E-08	6.1E-08
E	6.1E-08	6.1E-08	6.1E-08	6.1E-08	6.1E-08	6.1E-08
ENE	6.1E-08	6.1E-08	6.1E-08	6.1E-08	6.1E-08	6.1E-08
NE	6.1E-08	6.1E-08	6.1E-08	6.1E-08	6.1E-08	6.1E-08
NNE	6.1E-08	6.1E-08	6.1E-08	6.1E-08	6.1E-08	6.1E-08

C A P 8 8 - P C

Version 1.00

Clean Air Act Assessment Package - 1988

GENERAL DATA

Non-Radon Individual Assessment

Jul 13, 1997, 4:17 p.m.

Facility: US DEPARTMENT OF ENERGY PINELLAS PLANT
Address: P.O. Box 2900
7887 Bryan Dairy Road
City: Largo
State: FL Zip: 33779-2900
Source Category: POINT
Source Type: Stack
Emission Year: 1997
Comments: INDIVIDUAL RUN ANNUAL NESHAP REPORT 7/97
Dataset Name: 1997indiv
Dataset Date: Jul 13, 1997, 4:15 p.m.
Wind File: WNDFILES\TPA96.WND

VALUES FOR RADIONUCLIDE-DEPENDENT PARAMETERS

Nuclide	Clearance Class	Particle Size (microns)	Scavenging Coefficient (per second)	Dry Deposition Velocity (m/s)
H-3	*	0.0	0.00E+00	0.00E+00
KR-85	*	0.0	0.00E+00	0.00E+00

VALUES FOR RADIONUCLIDE-DEPENDENT PARAMETERS

Nuclide	DECAY CONSTANT (PER DAY)			TRANSFER COEFFICIENT	
	Radioactive (1)	Surface	Water	Milk (2)	Meat (3)
H-3	0.00E+00	5.48E-05	0.00E+00	0.00E+00	0.00E+00
KR-85	0.00E+00	5.48E-05	0.00E+00	0.00E+00	0.00E+00

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
H-3	0.00E+00	0.00E+00	9.50E-01	9.50E-01
KR-85	0.00E+00	0.00E+00	0.00E+00	0.00E+00

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
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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
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FRACTIONS GROWN IN GARDEN OF INTEREST

Produce ingested	1.00E+00
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Leafy vegetables ingested	1.00E+00
---------------------------	----------

INGESTION RATIOS:

IMMEDIATE SURROUNDING AREA/TOTAL WITHIN AREA

Vegetables	7.60E-02
------------	----------

Meat	8.00E-03
------	----------

Milk	0.00E+00
------	----------

MINIMUM INGESTION FRACTIONS FROM OUTSIDE AREA

(Minimum fractions of food types from outside area listed below are actual fixed values.)

Vegetables	0.00E+00
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Meat	0.00E+00
------	----------

Milk	0.00E+00
------	----------

HUMAN FOOD UTILIZATION FACTORS

Produce ingestion (kg/y)	1.76E+02
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Milk ingestion (L/y)	1.12E+02
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Meat ingestion (kg/y)	8.50E+01
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Leafy vegetable ingestion (kg/y)	1.80E+01
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SWIMMING PARAMETERS

Fraction of time spent swimming	0.00E+00
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Dilution factor for water (cm)	1.00E+00
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C A P 8 8 - P C

Version 1.00

Clean Air Act Assessment Package - 1988

W E A T H E R D A T A

Non-Radon Individual Assessment

Jul 13, 1997, 4:17 p.m.

Facility:	US DEPARTMENT OF ENERGY PINELLAS PLANT
Address:	P.O. Box 2900
	7887 Bryan Dairy Road
City:	Largo
State:	FL Zip: 33779-2900
Source Category:	POINT
Source Type:	Stack
Emission Year:	1997
Comments:	INDIVIDUAL RUN ANNUAL NESHAP REPORT 7/97
Dataset Name:	1997indiv
Dataset Date:	Jul 13, 1997 4:15 p.m.
Wind File:	WNDFILES\TPA96.WND

HARMONIC AVERAGE WIND SPEEDS (WIND TOWARDS)

Pasquill Stability Class								Wind
Dir	A	B	C	D	E	F	G	Frequency
N	1.435	2.266	3.245	4.495	3.301	1.204	0.000	0.068
NNW	1.411	2.197	3.279	3.742	3.049	1.091	0.000	0.037
NW	1.234	2.023	3.197	4.351	3.143	1.228	0.000	0.057
WNW	1.323	1.894	3.450	3.964	3.511	1.256	0.000	0.064
W	1.117	1.724	2.586	4.269	3.132	1.079	0.000	0.121
WSW	1.435	1.886	2.971	4.298	2.895	1.091	0.000	0.117
SW	1.447	1.695	3.312	4.416	3.227	1.171	0.000	0.062
SSW	1.118	1.945	3.231	5.003	3.857	1.165	0.000	0.053
S	1.447	2.159	3.437	5.481	3.668	1.204	0.000	0.071
SSE	0.772	1.602	3.750	5.711	3.891	1.348	0.000	0.057
SE	0.000	2.444	3.841	5.855	3.441	1.168	0.000	0.041
ESE	1.429	2.363	4.023	5.702	3.660	1.367	0.000	0.033
E	1.433	2.629	3.871	4.687	3.632	1.249	0.000	0.081
ENE	1.377	2.377	3.195	4.155	3.670	1.334	0.000	0.055
NE	1.349	2.500	2.809	4.761	3.239	1.119	0.000	0.041
NNE	1.234	2.109	3.485	4.875	3.755	1.231	0.000	0.043

ARITHMETIC AVERAGE WIND SPEEDS (WIND TOWARDS)

Pasquill Stability Class							
Dir	A	B	C	D	E	F	G
N	1.960	3.080	4.169	5.116	3.538	1.695	0.000
NNW	1.937	2.918	3.928	4.330	3.256	1.524	0.000
NW	1.735	2.965	3.909	4.885	3.366	1.727	0.000
WNW	1.844	2.811	3.950	4.571	3.742	1.763	0.000
W	1.567	2.572	3.426	4.981	3.354	1.504	0.000
WSW	1.960	2.884	3.660	4.915	3.060	1.525	0.000
SW	1.972	2.681	3.701	4.893	3.460	1.649	0.000
SSW	1.568	2.801	3.904	5.426	4.029	1.640	0.000
S	1.972	2.956	4.078	6.003	3.879	1.696	0.000
SSE	0.772	2.432	4.490	6.341	4.054	1.871	0.000
SE	0.000	2.928	4.247	6.616	3.676	1.645	0.000
ESE	1.955	3.159	4.625	6.503	3.872	1.892	0.000
E	1.959	3.438	4.470	5.403	3.848	1.754	0.000
ENE	1.902	3.166	3.983	4.711	3.880	1.856	0.000
NE	1.873	3.210	3.586	5.335	3.472	1.569	0.000
NNE	1.735	2.890	4.171	5.643	3.949	1.732	0.000

FREQUENCIES OF STABILITY CLASSES (WIND TOWARDS)

Dir	Pasquill Stability Class						
	A	B	C	D	E	F	G
N	0.0152	0.1143	0.1709	0.2395	0.1381	0.3219	0.0000
NNW	0.0046	0.0956	0.2096	0.1391	0.1537	0.3975	0.0000
NW	0.0150	0.1227	0.1982	0.1155	0.1851	0.3635	0.0000
WNW	0.0273	0.1188	0.1527	0.1060	0.2045	0.3907	0.0000
W	0.0170	0.0769	0.1578	0.1259	0.1360	0.4864	0.0000
WSW	0.0088	0.0753	0.1109	0.1324	0.1292	0.5434	0.0000
SW	0.0112	0.0591	0.1258	0.1475	0.1383	0.5182	0.0000
SSW	0.0099	0.0673	0.1471	0.2730	0.2380	0.2648	0.0000
S	0.0097	0.0579	0.0830	0.2587	0.1804	0.4105	0.0000
SSE	0.0030	0.0543	0.1276	0.3515	0.1246	0.3390	0.0000
SE	0.0000	0.0207	0.1218	0.3728	0.1343	0.3504	0.0000
ESE	0.0107	0.0551	0.2907	0.2846	0.1249	0.2340	0.0000
E	0.0170	0.2259	0.3697	0.1421	0.1011	0.1442	0.0000
ENE	0.0627	0.3183	0.2346	0.1415	0.0913	0.1517	0.0000
NE	0.0553	0.3091	0.1907	0.1268	0.1406	0.1776	0.0000
NNE	0.0200	0.1532	0.2395	0.2737	0.0901	0.2235	0.0000
TOT	0.0172	0.1160	0.1766	0.1883	0.1437	0.3583	0.0000

ADDITIONAL WEATHER INFORMATION

Average Air Temperature:	22.1 degrees C
	295.3 K
Precipitation:	125.5 cm/y
Lid Height:	1500 meters
Surface Roughness Length:	0.010 meters
Height Of Wind Measurements:	10.0 meters
Average Wind Speed:	3.236 m/s
Vertical Temperature Gradients:	
STABILITY E	0.073 k/m
STABILITY F	0.109 k/m
STABILITY G	0.146 k/m

APPENDIX C

Summary of Stack Flowrate Measurements Conducted

Summary of Radiological Stack Flow Measurements for DOE Pinellas Plant

Stack ID	Test Run Number	Average Stack Gas Temp (°F)	Stack Gas Moisture (%)	Stack Flow Rate		Actual Velocity (ft/sec)
				(dscfm)	(acfm)	
Building 800 Stack	1	81.7	1.3	1,050	1,429	10.83
	2	80.9	1.3	1,051	1,428	10.82
	3	80.2	1.3	1,051	1,428	10.81
	Average	80.9	1.3	1,051	1,428	10.82
Analytical Laboratory Stack (Roof Opening 489)	1	77.4	1.3	5,001	5,131	41.72
	2	77.7	1.3	5,017	5,150	41.87
	3	76.9	1.3	5,045	5,172	42.05
	Average	77.3	1.3	5,021	5,151	41.88

APPENDIX D

CAP88 - PC

Non-Radon Population Assessment

CAP88-PC

Version 1.00

Clean Air Act Assessment Package - 1988

SYNOPSIS REPORT

Non-Radon Population Assessment

Jul 13, 1997 4:16 pm

Facility: US DEPARTMENT OF ENERGY PINELLAS PLANT

Address: P.O. Box 2900

7887 Bryan Dairy Road

City: Largo

State: FL Zip: 33779-2900

Effective Dose Equivalent
(mrem/year)

2.49E-04

At This Location: 2500 Meters West Southwest

Source Category: POINT

Source Type: Stack

Emission Year: 1997

Comments: POPULATION RUN ANNUAL NESHAP REPORT

Dataset Name: 1997POP

Dataset Date: Jul 13, 1997, 4:16 p.m.

Wind File: WNDFILES\TPA96.WND

Population File: POPFILES\PINELLAS.POP

MAXIMALLY EXPOSED INDIVIDUAL

Location Of The Individual: 2500 Meters West Southwest
 Lifetime Fatal Cancer Risk: 6.79E-09

ORGAN DOSE EQUIVALENT SUMMARY

Organ	Selected Individual (mrem/y)	Collective Population (person-rem/y)
GONADS	2.44E-04	2.46E-02
BREAST	2.44E-04	2.46E-02
R MAR	2.42E-04	2.44E-02
LUNGS	2.44E-04	2.47E-02
THYROID	2.42E-04	2.45E-02
ENDOST	1.92E-04	1.94E-02
RMNDR	2.66E-04	2.90E-02
EFEC	2.49E-04	2.57E-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	1935868	1935868	9.89E-06	9.89E-06

RADIONUCLIDE EMISSIONS DURING THE YEAR 1997

Nuclide	Class	Size	Source #1 Ci/y	Source #2 Ci/y	TOTAL Ci/y
H-3	*	0.00	3.3E+00	5.0E-04	3.3E+00
KR-85	*	0.00	0.0E+00	0.0E+00	0.0E+00

SITE INFORMATION

Temperature: 22 degrees C
Precipitation: 126 cm/y
Mixing Height: 1500 m

SOURCE INFORMATION

Source Number:	1	2
	<hr/>	<hr/>
Stack Height (m):	9.14	11.09
Diameter (m):	0.51	0.43
Plume Rise		
Momentum (m/s):	3.30E+00	1.28E+01
(Exit Velocity)		

AGRICULTURAL DATA

	Vegetable	Milk	Meat
	<hr/>	<hr/>	<hr/>
Fraction Home Produced:	0.076	0.000	0.008
Fraction From Assessment Area:	0.924	1.000	0.992
Fraction Imported:	0.000	0.000	0.000
Beef Cattle Density:	1.28E-01		
Milk Cattle Density:	1.37E-02		
Land Fraction Cultivated for Vegetable Crops:	6.92E-03		

POPULATION DATA

	Distance (m)						
Direction	250	750	1500	2500	3500	4500	7500
N	0	0	0	0	5349	0	23419
NNW	0	0	0	0	3337	0	24126
NW	0	0	4420	0	0	5299	15019
WNW	0	0	772	0	1723	3633	18250
W	0	0	0	2073	3049	892	13987
WSW	0	0	0	1253	788	2976	19204
SW	0	0	0	0	0	2233	11080
SSW	0	0	0	1594	2051	0	12853
S	0	0	0	9537	0	3431	13762
SSE	0	0	0	0	0	980	24821
SE	0	0	0	0	3512	3789	22519
ESE	0	0	0	0	0	0	14582
E	0	0	1136	0	2361	582	2405
ENE	0	0	0	0	0	0	0
NE	0	0	0	0	0	1727	5950
NNE	0	0	0	0	4653	0	16752

Direction	Distance (m)					
	15000	25000	35000	45000	55000	70000
N	67940	28105	61561	52882	22492	2936
NNW	28218	616	0	0	0	0
NW	2272	0	0	0	0	0
WNW	0	0	0	0	0	0
W	0	0	0	0	0	0
WSW	0	0	0	0	0	0
SW	0	0	0	0	0	0
SSW	1566	0	0	0	0	0
S	23485	2956	3764	5416	1957	0
SSE	72904	12297	3117	87593	50840	130507
SE	85745	3026	469	3625	0	197
ESE	47840	0	10656	9190	2661	0
E	6112	52844	26569	43529	12463	36551
ENE	2546	97369	167019	48541	17970	59683
NE	645	50970	51629	13212	4583	28752
NNE	22292	11978	2066	10506	6412	22915

CAP88-PC

Version 1.00

Clean Air Act Assessment Package - 1988

DOSE AND RISK EQUIVALENT SUMMARIES

Non-Radon Population Assessment

Jul 13, 1997, 4:16 pm

Facility: US DEPARTMENT OF ENERGY PINELLAS PLANT
Address: P.O. Box 2900
7887 Bryan Dairy Road
City: Largo
State: FL Zip: 33779-2900
Source Category: POINT
Source Type: Stack
Emission Year: 1997
Comments: POPULATION RUN ANNUAL NESHAP REPORT
Dataset Name: 1997POP
Dataset Date: Jul 13, 1997, 4:16 p.m.
Wind File: WNDFILES\TPA96.WND
Population File: POPFILES\PINELLAS.POP

ORGAN DOSE EQUIVALENT SUMMARY

Organ	Selected Individual (mrem/y)	Collective Population (person-rem/y)
GONADS	2.44E-04	2.46E-02
BREAST	2.44E-04	2.46E-02
R MAR	2.42E-04	2.44E-02
LUNGS	2.44E-04	2.47E-02
THYROID	2.42E-04	2.45E-02
ENDOST	1.92E-04	1.94E-02
RMNDR	2.66E-04	2.90E-02
EFPEC	2.49E-04	2.57E-02

PATHWAY EFFECTIVE DOSE EQUIVALENT SUMMARY

Pathway	Selected Individual (mrem/y)	Collective Population (person-rem/y)
INGESTION	3.32E-05	1.30E-02
INHALATION	2.16E-04	1.28E-02
AIR IMMERSION	0.00E+00	0.00E+00
GROUND SURFACE	0.00E+00	0.00E+00
INTERNAL	2.49E-04	2.57E-02
EXTERNAL	0.00E+00	0.00E+00
TOTAL	2.49E-04	2.57E-02

NUCLIDE EFFECTIVE DOSE EQUIVALENT SUMMARY

Nuclides	Selected Individual (mrem/y)	Collective Population (person-rem/y)
H-3	2.49E-04	2.57E-02
KR-85	0.00E+00	0.00E+00
TOTAL	2.49E-04	2.57E-02

CANCER RISK SUMMARY

Cancer	Selected Individual Total Lifetime Fatal Cancer Risk	Total Collective Population Fatal Cancer Risk (Deaths/y)
LEUKEMIA	7.67E-10	1.09E-06
BONE	3.40E-11	4.86E-08
THYROID	1.10E-10	1.57E-07
BREAST	9.56E-10	1.36E-06
LUNG	1.21E-09	1.73E-06
STOMACH	8.23E-10	1.30E-06
BOWEL	4.42E-10	7.04E-07
LIVER	8.49E-10	1.21E-06
PANCREAS	5.78E-10	8.25E-07
URINARY	3.16E-10	4.50E-07
OTHER	7.07E-10	1.01E-06
TOTAL	6.79E-09	9.89E-06

PATHWAY RISK SUMMARY

Pathway	Selected Individual Total Lifetime Fatal Cancer Risk	Total Collective Population Fatal Cancer Risk (Deaths/y)
INGESTION	8.96E-10	4.95E-06
INHALATION	5.90E-09	4.93E-06
AIR IMMERSION	0.00E+00	0.00E+00
GROUND SURFACE	0.00E+00	0.00E+00
INTERNAL	6.79E-09	9.89E-06
EXTERNAL	0.00E+00	0.00E+00
TOTAL	6.79E-09	9.89E-06

PATHWAY GENETIC RISK SUMMARY

(Collective Population)

Pathway	Genetic Risk (person-rem/y)
INGESTION	1.20E-02
INHALATION	1.26E-02
AIR IMMERSION	0.00E+00
GROUND SURFACE	0.00E+00
INTERNAL	2.45E-02
EXTERNAL	0.00E+00
TOTAL	2.45E-02

NUCLIDE RISK SUMMARY

Nuclide	Selected Individual Total Lifetime Fatal Cancer Risk	Total Collective Population Fatal Cancer Risk (Deaths/y)
H-3	6.79E-09	9.89E-06
KR-85	0.00E+00	0.00E+00
TOTAL	6.79E-09	9.89E-06

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

Direction	Distance (m)						
	250	750	1500	2500	3500	4500	7500
N	0.0E+00	0.0E+00	0.0E+00	0.0E+00	5.8E-05	0.0E+00	2.4E-05
NNW	0.0E+00	0.0E+00	0.0E+00	0.0E+00	4.3E-05	0.0E+00	1.9E-05
NW	0.0E+00	0.0E+00	1.7E-04	0.0E+00	0.0E+00	4.0E-05	2.3E-05
WNW	0.0E+00	0.0E+00	2.0E-04	0.0E+00	6.1E-05	4.5E-05	2.6E-05
W	0.0E+00	0.0E+00	0.0E+00	2.4E-04	1.5E-04	1.1E-04	5.7E-05
WSW	0.0E+00	0.0E+00	0.0E+00	2.5E-04	1.6E-04	1.1E-04	6.0E-05
SW	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	5.7E-05	3.2E-05
SSW	0.0E+00	0.0E+00	0.0E+00	6.5E-05	4.2E-05	0.0E+00	1.9E-05
S	0.0E+00	0.0E+00	0.0E+00	1.1E-04	0.0E+00	5.3E-05	3.0E-05
SSE	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	3.5E-05	2.0E-05
SE	0.0E+00	0.0E+00	0.0E+00	0.0E+00	4.0E-05	3.1E-05	1.8E-05
ESE	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	1.2E-05
E	0.0E+00	0.0E+00	1.2E-04	0.0E+00	3.7E-05	2.8E-05	1.7E-05
ENE	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
NE	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	2.0E-05	1.3E-05
NNE	0.0E+00	0.0E+00	0.0E+00	0.0E+00	3.0E-05	0.0E+00	1.4E-05

Direction	Distance (m)					
	15000	25000	35000	45000	55000	70000
N	1.4E-05	1.0E-05	8.9E-06	8.1E-06	7.7E-06	7.3E-06
NNW	1.2E-05	9.1E-06	0.0E+00	0.0E+00	0.0E+00	0.0E+00
NW	1.3E-05	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
WNW	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
W	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
WSW	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
SW	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
SSW	1.1E-05	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
S	1.6E-05	1.2E-05	9.8E-06	8.9E-06	8.3E-06	0.0E+00
SSE	1.2E-05	9.3E-06	8.2E-06	7.6E-06	7.3E-06	7.0E-06
SE	1.1E-05	8.8E-06	7.9E-06	7.4E-06	0.0E+00	6.8E-06
ESE	8.4E-06	0.0E+00	6.8E-06	6.6E-06	6.5E-06	0.0E+00
E	1.0E-05	8.4E-06	7.6E-06	7.2E-06	6.9E-06	6.7E-06
ENE	8.9E-06	7.6E-06	7.0E-06	6.7E-06	6.6E-06	6.4E-06
NE	8.9E-06	7.6E-06	7.0E-06	6.7E-06	6.6E-06	6.4E-06
NNE	9.4E-06	7.8E-06	7.2E-06	6.9E-06	6.7E-06	6.5E-06

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

Direction	Distance (m)						
	250	750	1500	2500	3500	4500	7500
N	0.0E+00	0.0E+00	0.0E+00	0.0E+00	3.1E-04	0.0E+00	5.7E-04
NNW	0.0E+00	0.0E+00	0.0E+00	0.0E+00	1.4E-04	0.0E+00	4.6E-04
NW	0.0E+00	0.0E+00	7.6E-04	0.0E+00	0.0E+00	2.1E-04	3.4E-04
WNW	0.0E+00	0.0E+00	1.5E-04	0.0E+00	1.1E-04	1.6E-04	4.7E-04
W	0.0E+00	0.0E+00	0.0E+00	4.9E-04	4.6E-04	9.7E-05	8.0E-04
WSW	0.0E+00	0.0E+00	0.0E+00	3.1E-04	1.2E-04	3.4E-04	1.2E-03
SW	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	1.3E-04	3.5E-04
SSW	0.0E+00	0.0E+00	0.0E+00	1.0E-04	8.7E-05	0.0E+00	2.4E-04
S	0.0E+00	0.0E+00	0.0E+00	1.1E-03	0.0E+00	1.8E-04	4.1E-04
SSE	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	3.4E-05	5.0E-04
SE	0.0E+00	0.0E+00	0.0E+00	0.0E+00	1.4E-04	1.2E-04	4.1E-04
ESE	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	1.7E-04
E	0.0E+00	0.0E+00	1.4E-04	0.0E+00	8.8E-05	1.6E-05	4.0E-05
ENE	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
NE	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	3.5E-05	7.7E-05
NNE	0.0E+00	0.0E+00	0.0E+00	0.0E+00	1.4E-04	0.0E+00	2.4E-04

Direction	Distance (m)					
	15000	25000	35000	45000	55000	70000
N	9.3E-04	2.9E-04	5.5E-04	4.3E-04	1.7E-04	2.1E-05
NNW	3.2E-04	5.6E-06	0.0E+00	0.0E+00	0.0E+00	0.0E+00
NW	3.0E-05	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
WNW	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
W	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
WSW	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
SW	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
SSW	1.8E-05	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
S	3.8E-04	3.4E-05	3.7E-05	4.8E-05	1.6E-05	0.0E+00
SSE	8.8E-04	1.1E-04	2.6E-05	6.7E-04	3.7E-04	9.1E-04
SE	9.6E-04	2.7E-05	3.7E-06	2.7E-05	0.0E+00	1.3E-06
ESE	4.0E-04	0.0E+00	7.3E-05	6.1E-05	1.7E-05	0.0E+00
E	6.3E-05	4.4E-04	2.0E-04	3.1E-04	8.6E-05	2.4E-04
ENE	2.3E-05	7.4E-04	1.2E-03	3.3E-04	1.2E-04	3.8E-04
NE	5.7E-06	3.9E-04	3.6E-04	8.9E-05	3.0E-05	1.8E-04
NNE	2.1E-04	9.4E-05	1.5E-05	7.2E-05	4.3E-05	1.5E-04

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

Direction	Distance (m)						
	250	750	1500	2500	3500	4500	7500
N	0.0E+00	0.0E+00	0.0E+00	0.0E+00	9.0E-03	0.0E+00	1.6E-02
NNW	0.0E+00	0.0E+00	0.0E+00	0.0E+00	4.1E-03	0.0E+00	1.3E-02
NW	0.0E+00	0.0E+00	2.2E-02	0.0E+00	0.0E+00	6.2E-03	1.0E-02
WNW	0.0E+00	0.0E+00	4.4E-03	0.0E+00	3.1E-03	4.8E-03	1.3E-02
W	0.0E+00	0.0E+00	0.0E+00	1.4E-02	1.3E-02	2.8E-03	2.3E-02
WSW	0.0E+00	0.0E+00	0.0E+00	9.1E-03	3.6E-03	9.9E-03	3.4E-02
SW	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	3.7E-03	1.0E-02
SSW	0.0E+00	0.0E+00	0.0E+00	3.0E-03	2.5E-03	0.0E+00	6.9E-03
S	0.0E+00	0.0E+00	0.0E+00	3.2E-02	0.0E+00	5.3E-03	1.2E-02
SSE	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	9.9E-04	1.5E-02
SE	0.0E+00	0.0E+00	0.0E+00	0.0E+00	4.1E-03	3.4E-03	1.2E-02
ESE	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	5.0E-03
E	0.0E+00	0.0E+00	4.0E-03	0.0E+00	2.6E-03	4.7E-04	1.1E-03
ENE	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
NE	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	1.0E-03	2.2E-03
NNE	0.0E+00	0.0E+00	0.0E+00	0.0E+00	4.0E-03	0.0E+00	6.8E-03

Direction	Distance (m)					
	15000	25000	35000	45000	55000	70000
N	2.7E-02	8.2E-03	1.5E-02	1.2E-02	4.9E-03	6.0E-04
NNW	9.3E-03	1.6E-04	0.0E+00	0.0E+00	0.0E+00	0.0E+00
NW	8.6E-04	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
WNW	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
W	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
WSW	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
SW	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
SSW	5.1E-04	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
S	1.1E-02	9.8E-04	1.0E-03	1.4E-03	4.6E-04	0.0E+00
SSE	2.5E-02	3.2E-03	7.2E-04	1.9E-02	1.0E-02	2.5E-02
SE	2.7E-02	7.6E-04	1.0E-04	7.5E-04	0.0E+00	3.7E-05
ESE	1.1E-02	0.0E+00	2.0E-03	1.7E-03	4.8E-04	0.0E+00
E	1.8E-03	1.2E-02	5.7E-03	8.7E-03	2.4E-03	6.8E-03
ENE	6.4E-04	2.1E-02	3.3E-02	9.1E-03	3.3E-03	1.1E-02
NE	1.6E-04	1.1E-02	1.0E-02	2.5E-03	8.4E-04	5.1E-03
NNE	5.9E-03	2.6E-03	4.2E-04	2.0E-03	1.2E-03	4.1E-03

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

Direction	Distance (m)						
	250	750	1500	2500	3500	4500	7500
N	0.0E+00	0.0E+00	0.0E+00	0.0E+00	1.6E-09	0.0E+00	6.6E-10
NNW	0.0E+00	0.0E+00	0.0E+00	0.0E+00	1.2E-09	0.0E+00	5.2E-10
NW	0.0E+00	0.0E+00	4.7E-09	0.0E+00	0.0E+00	1.1E-09	6.2E-10
WNW	0.0E+00	0.0E+00	5.4E-09	0.0E+00	1.7E-09	1.2E-09	7.0E-10
W	0.0E+00	0.0E+00	0.0E+00	6.5E-09	4.1E-09	3.0E-09	1.6E-09
WSW	0.0E+00	0.0E+00	0.0E+00	6.8E-09	4.3E-09	3.1E-09	1.6E-09
SW	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	1.6E-09	8.6E-10
SSW	0.0E+00	0.0E+00	0.0E+00	1.8E-09	1.2E-09	0.0E+00	5.1E-10
S	0.0E+00	0.0E+00	0.0E+00	3.1E-09	0.0E+00	1.5E-09	8.1E-10
SSE	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	9.4E-10	5.5E-10
SE	0.0E+00	0.0E+00	0.0E+00	0.0E+00	1.1E-09	8.3E-10	5.0E-10
ESE	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	3.2E-10
E	0.0E+00	0.0E+00	3.3E-09	0.0E+00	1.0E-09	7.6E-10	4.5E-10
ENE	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
NE	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	5.5E-10	3.5E-10
NNE	0.0E+00	0.0E+00	0.0E+00	0.0E+00	8.0E-10	0.0E+00	3.8E-10

Direction	Distance (m)					
	15000	25000	35000	45000	55000	70000
N	3.7E-10	2.8E-10	2.4E-10	2.2E-10	2.1E-10	2.0E-10
NNW	3.1E-10	2.5E-10	0.0E+00	0.0E+00	0.0E+00	0.0E+00
NW	3.6E-10	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
WNW	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
W	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
WSW	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
SW	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
SSW	3.1E-10	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
S	4.4E-10	3.2E-10	2.7E-10	2.4E-10	2.2E-10	0.0E+00
SSE	3.3E-10	2.5E-10	2.2E-10	2.1E-10	2.0E-10	1.9E-10
SE	3.0E-10	2.4E-10	2.1E-10	2.0E-10	0.0E+00	1.8E-10
ESE	2.3E-10	0.0E+00	1.9E-10	1.8E-10	1.7E-10	0.0E+00
E	2.8E-10	2.3E-10	2.1E-10	1.9E-10	1.9E-10	1.8E-10
ENE	2.4E-10	2.0E-10	1.9E-10	1.8E-10	1.8E-10	1.7E-10
NE	2.4E-10	2.1E-10	1.9E-10	1.8E-10	1.8E-10	1.7E-10
NNE	2.5E-10	2.1E-10	2.0E-10	1.9E-10	1.8E-10	1.8E-10

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

Direction	Distance (m)						
	250	750	1500	2500	3500	4500	7500
N	0.0E+00	0.0E+00	0.0E+00	0.0E+00	1.2E-07	0.0E+00	2.2E-07
NNW	0.0E+00	0.0E+00	0.0E+00	0.0E+00	5.5E-08	0.0E+00	1.8E-07
NW	0.0E+00	0.0E+00	2.9E-07	0.0E+00	0.0E+00	8.2E-08	1.3E-07
WNW	0.0E+00	0.0E+00	5.8E-08	0.0E+00	4.1E-08	6.3E-08	1.8E-07
W	0.0E+00	0.0E+00	0.0E+00	1.9E-07	1.8E-07	3.7E-08	3.1E-07
WSW	0.0E+00	0.0E+00	0.0E+00	1.2E-07	4.8E-08	1.3E-07	4.5E-07
SW	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	4.9E-08	1.3E-07
SSW	0.0E+00	0.0E+00	0.0E+00	4.0E-08	3.3E-08	0.0E+00	9.3E-08
S	0.0E+00	0.0E+00	0.0E+00	4.2E-07	0.0E+00	7.0E-08	1.6E-07
SSE	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	1.3E-08	1.9E-07
SE	0.0E+00	0.0E+00	0.0E+00	0.0E+00	5.5E-08	4.5E-08	1.6E-07
ESE	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	6.7E-08
E	0.0E+00	0.0E+00	5.2E-08	0.0E+00	3.4E-08	6.2E-09	1.5E-08
ENE	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
NE	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	1.3E-08	3.0E-08
NNE	0.0E+00	0.0E+00	0.0E+00	0.0E+00	5.3E-08	0.0E+00	9.1E-08

Direction	Distance (m)					
	15000	25000	35000	45000	55000	70000
N	3.6E-07	1.1E-07	2.1E-07	1.7E-07	6.6E-08	8.2E-09
NNW	1.2E-07	2.1E-09	0.0E+00	0.0E+00	0.0E+00	0.0E+00
NW	1.2E-08	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
WNW	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
W	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
WSW	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
SW	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
SSW	6.8E-09	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
S	1.5E-07	1.3E-08	1.4E-08	1.8E-08	6.2E-09	0.0E+00
SSE	3.4E-07	4.4E-08	9.8E-09	2.6E-07	1.4E-07	3.5E-07
SE	3.7E-07	1.0E-08	1.4E-09	1.0E-08	0.0E+00	5.1E-10
ESE	1.5E-07	0.0E+00	2.8E-08	2.3E-08	6.6E-09	0.0E+00
E	2.4E-08	1.7E-07	7.7E-08	1.2E-07	3.3E-08	9.3E-08
ENE	8.7E-09	2.8E-07	4.5E-07	1.3E-07	4.5E-08	1.5E-07
NE	2.2E-09	1.5E-07	1.4E-07	3.4E-08	1.2E-08	7.0E-08
NNE	8.0E-08	3.6E-08	5.7E-09	2.8E-08	1.6E-08	5.7E-08

CAP88-PC

Version 1.00

Clean Air Act Assessment Package - 1988

GENERAL DATA

Non-Radon Population Assessment

Jul 13, 1997, 4:16 pm

Facility:	US DEPARTMENT OF ENERGY PINELLAS PLANT
Address:	P.O. Box 2900 7887 Bryan Dairy Road
City:	Largo
State:	FL Zip: 33779-2900
Source Category:	POINT
Source Type:	Stack
Emission Year:	1997
Comments:	POPULATION RUN ANNUAL NESHAP REPORT
Dataset Name:	1997POP
Dataset Date:	Jul 13, 1997, 4:16 pm
Wind File:	WNDFILES\TPA96.WND
Population File:	POPFILES\PINELLAS.POP

VALUES FOR RADIONUCLIDE-DEPENDENT PARAMETERS

<u>Nuclide</u>	<u>Clearance Class</u>	<u>Particle Size (microns)</u>	<u>Scavenging Coefficient (per second)</u>	<u>Dry Deposition Velocity (m/s)</u>
H-3	*	0.0	0.00E+00	0.00E+00
KR-85	*	0.0	0.00E+00	0.00E+00

VALUES FOR RADIONUCLIDE-DEPENDENT PARAMETERS

<u>Nuclide</u>	<u>DECAY CONSTANT (PER DAY)</u>			<u>TRANSFER COEFFICIENT</u>	
	<u>Radioactive (1)</u>	<u>Surface</u>	<u>Water</u>	<u>Milk (2)</u>	<u>Meat (3)</u>
H-3	0.00E+00	5.48E-05	0.00E+00	0.00E+00	0.00E+00
KR-85	0.00E+00	5.48E-05	0.00E+00	0.00E+00	0.00E+00

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
H-3	0.00E+00	0.00E+00	9.50E-01	9.50E-01
KR-85	0.00E+00	0.00E+00	0.00E+00	0.00E+00

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

NUMBER OF BEEF CATTLE

Direction	Distance (meters)						
	250	750	1500	2500	3500	4500	7500
N	0	2	8	13	18	23	188
NNW	0	2	8	13	18	23	188
NW	0	2	8	13	18	23	188
WNW	0	2	8	13	18	23	188
W	0	2	8	13	18	23	188
WSW	0	2	8	13	18	23	188
SW	0	2	8	13	18	23	188
SSW	0	2	8	13	18	23	188
S	0	2	8	13	18	23	188
SSE	0	2	8	13	18	23	188
SE	0	2	8	13	18	23	188
ESE	0	2	8	13	18	23	188
E	0	2	8	13	18	23	188
ENE	0	2	8	13	18	23	188
NE	0	2	8	13	18	23	188
NNE	0	2	8	13	18	23	188

Direction	Distance (meters)					
	15000	25000	35000	45000	55000	70000
N	754	1257	1759	2262	2765	7037
NNW	754	1257	1759	2262	2765	7037
NW	754	1257	1759	2262	2765	7037
WNW	754	1257	1759	2262	2765	7037
W	754	1257	1759	2262	2765	7037
WSW	754	1257	1759	2262	2765	7037
SW	754	1257	1759	2262	2765	7037
SSW	754	1257	1759	2262	2765	7037
S	754	1257	1759	2262	2765	7037
SSE	754	1257	1759	2262	2765	7037
SE	754	1257	1759	2262	2765	7037
ESE	754	1257	1759	2262	2765	7037
E	754	1257	1759	2262	2765	7037
ENE	754	1257	1759	2262	2765	7037
NE	754	1257	1759	2262	2765	7037
NNE	754	1257	1759	2262	2765	7037

NUMBER OF MILK CATTLE

Direction	Distance (meters)						
	250	750	1500	2500	3500	4500	7500
N	0	0	1	1	2	2	20
NNW	0	0	1	1	2	2	20
NW	0	0	1	1	2	2	20
WNW	0	0	1	1	2	2	20
W	0	0	1	1	2	2	20
WSW	0	0	1	1	2	2	20
SW	0	0	1	1	2	2	20
SSW	0	0	1	1	2	2	20
S	0	0	1	1	2	2	20
SSE	0	0	1	1	2	2	20
SE	0	0	1	1	2	2	20
ESE	0	0	1	1	2	2	20
E	0	0	1	1	2	2	20
ENE	0	0	1	1	2	2	20
NE	0	0	1	1	2	2	20
NNE	0	0	1	1	2	2	20

Direction	Distance (meters)					
	15000	25000	35000	45000	55000	70000
N	81	134	188	242	296	753
NNW	81	134	188	242	296	753
NW	81	134	188	242	296	753
WNW	81	134	188	242	296	753
W	81	134	188	242	296	753
WSW	81	134	188	242	296	753
SW	81	134	188	242	296	753
SSW	81	134	188	242	296	753
S	81	134	188	242	296	753
SSE	81	134	188	242	296	753
SE	81	134	188	242	296	753
ESE	81	134	188	242	296	753
E	81	134	188	242	296	753
ENE	81	134	188	242	296	753
NE	81	134	188	242	296	753
NNE	81	134	188	242	296	753

AREA OF VEGETABLE CROP PRODUCTION (M**2)

Direction	Distance (meters)						
	250	750	1500	2500	3500	4500	7500
N	0.0E+00	1.0E+03	4.1E+03	6.8E+03	9.5E+03	1.2E+04	1.0E+05
NNW	0.0E+00	1.0E+03	4.1E+03	6.8E+03	9.5E+03	1.2E+04	1.0E+05
NW	0.0E+00	1.0E+03	4.1E+03	6.8E+03	9.5E+03	1.2E+04	1.0E+05
WNW	0.0E+00	1.0E+03	4.1E+03	6.8E+03	9.5E+03	1.2E+04	1.0E+05
W	0.0E+00	1.0E+03	4.1E+03	6.8E+03	9.5E+03	1.2E+04	1.0E+05
WSW	0.0E+00	1.0E+03	4.1E+03	6.8E+03	9.5E+03	1.2E+04	1.0E+05
SW	0.0E+00	1.0E+03	4.1E+03	6.8E+03	9.5E+03	1.2E+04	1.0E+05
SSW	0.0E+00	1.0E+03	4.1E+03	6.8E+03	9.5E+03	1.2E+04	1.0E+05
S	0.0E+00	1.0E+03	4.1E+03	6.8E+03	9.5E+03	1.2E+04	1.0E+05
SSE	0.0E+00	1.0E+03	4.1E+03	6.8E+03	9.5E+03	1.2E+04	1.0E+05
SE	0.0E+00	1.0E+03	4.1E+03	6.8E+03	9.5E+03	1.2E+04	1.0E+05
ESE	0.0E+00	1.0E+03	4.1E+03	6.8E+03	9.5E+03	1.2E+04	1.0E+05
E	0.0E+00	1.0E+03	4.1E+03	6.8E+03	9.5E+03	1.2E+04	1.0E+05
ENE	0.0E+00	1.0E+03	4.1E+03	6.8E+03	9.5E+03	1.2E+04	1.0E+05
NE	0.0E+00	1.0E+03	4.1E+03	6.8E+03	9.5E+03	1.2E+04	1.0E+05
NNE	0.0E+00	1.0E+03	4.1E+03	6.8E+03	9.5E+03	1.2E+04	1.0E+05

Direction	Distance (meters)					
	15000	25000	35000	45000	55000	70000
N	4.1E+05	6.8E+05	9.5E+05	1.2E+06	1.5E+06	3.8E+06
NNW	4.1E+05	6.8E+05	9.5E+05	1.2E+06	1.5E+06	3.8E+06
NW	4.1E+05	6.8E+05	9.5E+05	1.2E+06	1.5E+06	3.8E+06
WNW	4.1E+05	6.8E+05	9.5E+05	1.2E+06	1.5E+06	3.8E+06
W	4.1E+05	6.8E+05	9.5E+05	1.2E+06	1.5E+06	3.8E+06
WSW	4.1E+05	6.8E+05	9.5E+05	1.2E+06	1.5E+06	3.8E+06
SW	4.1E+05	6.8E+05	9.5E+05	1.2E+06	1.5E+06	3.8E+06
SSW	4.1E+05	6.8E+05	9.5E+05	1.2E+06	1.5E+06	3.8E+06
S	4.1E+05	6.8E+05	9.5E+05	1.2E+06	1.5E+06	3.8E+06
SSE	4.1E+05	6.8E+05	9.5E+05	1.2E+06	1.5E+06	3.8E+06
SE	4.1E+05	6.8E+05	9.5E+05	1.2E+06	1.5E+06	3.8E+06
ESE	4.1E+05	6.8E+05	9.5E+05	1.2E+06	1.5E+06	3.8E+06
E	4.1E+05	6.8E+05	9.5E+05	1.2E+06	1.5E+06	3.8E+06
ENE	4.1E+05	6.8E+05	9.5E+05	1.2E+06	1.5E+06	3.8E+06
NE	4.1E+05	6.8E+05	9.5E+05	1.2E+06	1.5E+06	3.8E+06
NNE	4.1E+05	6.8E+05	9.5E+05	1.2E+06	1.5E+06	3.8E+06

VALUES FOR RADIONUCLIDE-INDEPENDENT PARAMETERS

HUMAN INHALATION RATE

Cubic centimeters/hr	9.17E+05
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SOIL PARAMETERS

Effective surface density (kg/sq m, dry weight) (Assumes 15 cm plow layer)	2.15E+02
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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
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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
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DAIRY PRODUCTIVITY

Milk production of cow (L/day)	1.10E+01
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MEAT ANIMAL SLAUGHTER PARAMETERS

Muscle mass of animal at slaughter (kg)	2.00E+02
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Fraction of herd slaughtered (per day)	3.81E-03
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DECONTAMINATION

Fraction of radioactivity retained after washing for leafy vegetables and produce	5.00E-01
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FRACTIONS GROWN IN GARDEN OF INTEREST

Produce ingested	1.00E+00
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Leafy vegetables ingested	1.00E+00
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INGESTION RATIOS:

IMMEDIATE SURROUNDING AREA/TOTAL WITHIN AREA

Vegetables	7.60E-02
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Meat	8.00E-03
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Milk	0.00E+00
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MINIMUM INGESTION FRACTIONS FROM OUTSIDE AREA

(Actual fractions of food types from outside area can be greater than the minimum fractions listed below.)

Vegetables	0.00E+00
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Meat	0.00E+00
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Milk	0.00E+00
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HUMAN FOOD UTILIZATION FACTORS

Produce ingestion (kg/y)	1.76E+02
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Milk ingestion (L/y)	1.12E+02
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Meat ingestion (kg/y)	8.50E+01
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Leafy vegetable ingestion (kg/y)	1.80E+01
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SWIMMING PARAMETERS

Fraction of time spent swimming	0.00E+00
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Dilution factor for water (cm)	1.00E+00
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APPENDIX E

Comply Computer Modeling Run, 1997

7/21/97 2:10

0 CFR Part 61
ational Emission Standards
or Hazardous Air Pollutants

REPORT ON COMPLIANCE WITH
THE CLEAN AIR ACT LIMITS FOR RADIONUCLIDE EMISSIONS
FROM THE COMPLY CODE, VERSION 1.4

Prepared by:

DEPARTMENT OF ENERGY
PINELLAS PLANT
7887 BRYAN DAIRY ROAD, LARGO FL.,

DAVID INGLE
(813) 541-8943

Prepared for:

U.S. Environmental Protection Agency
Office of Radiation Programs
Washington, D.C. 20460

1997 COMPLY RUN

SCREENING LEVEL 4
-----DATA ENTERED:

Nuclide	Release Rate (curies/YEAR)
H-3	V 3.300E+00

Release height 9 meters.

Building height 3 meters.

Stack diameter 0.51 meters.

Default volumetric flow rate from the stack not used.
 Volumetric flow rate is 0.674 cu m/sec.

STACK DISTANCES, FILE: A:DIST95.DAT

DIR	Distance (meters)
N	325.0
NNE	553.0
NE	423.0
ENE	200.0
E	100.0
ESE	358.0
SE	260.0
SSE	325.0
S	200.0
SSW	200.0
SW	228.0
WSW	620.0
W	390.0
WNW	276.0
NW	325.0
NNW	358.0

WINDROSE DATA, FILE: A:96WIND.DAT

Source of wind rose data: TAMPA INTERNATIONAL AIRPORT
 Dates of coverage: 1/1/96 TO 12/31/96
 Wind rose location: TAMPA INTERNATIONAL AIRPORT
 Distance to facility: 18 MILES

Percent calm: 0.12

Wind FROM	Frequency	Speed (miles/hr)
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N	0.062	8.50
NNE	0.048	8.70
NE	0.052	6.90
ENE	0.098	6.40
E	0.100	6.60
ESE	0.055	7.10
SE	0.050	7.20
SSE	0.032	7.00
S	0.060	8.20
SSW	0.039	8.90
SW	0.037	7.60
WSW	0.050	7.80
W	0.076	9.00
WNW	0.030	10.10
NW	0.037	10.10
NNW	0.051	9.90

Distance from the SOURCE to the FARM producing
 VEGETABLES is 6200 meters.

Distance from the SOURCE to the FARM producing
 MILK is 6200 meters.

Distance from the SOURCE to the FARM producing
 MEAT is 6800 meters.

NOTES:

Default air temperature not used.
 Air temperature 71.3 (degrees F).

Default stack temperature not used.
 Stack temperature 74.0 (degrees F).

The receptor exposed to the highest concentration is located
 100. meters from the source in the E sector.

He gets his VEGETABLES from a farm located
 6200. meters from the source in the WSW sector.

He gets his MEAT from a farm located
6800. meters from the source in the WSW sector.

He gets his MILK from a farm located
6200. meters from the source in the WSW sector.

Input parameters outside the "normal" range:

Meat farm is unusually FAR.
Milk farm is unusually FAR.
Air temperature is unusually HIGH.
Vegetable farm is unusually FAR.
Stack file distance is unusually FAR.

RESULTS:

Effective dose equivalent: 1.0E-03 mrem/yr.

*** Comply at level 4.

This facility is in COMPLIANCE.

It may or may not be EXEMPT from reporting to the EPA.

You may contact your regional EPA office for more information.

***** END OF COMPLIANCE REPORT *****