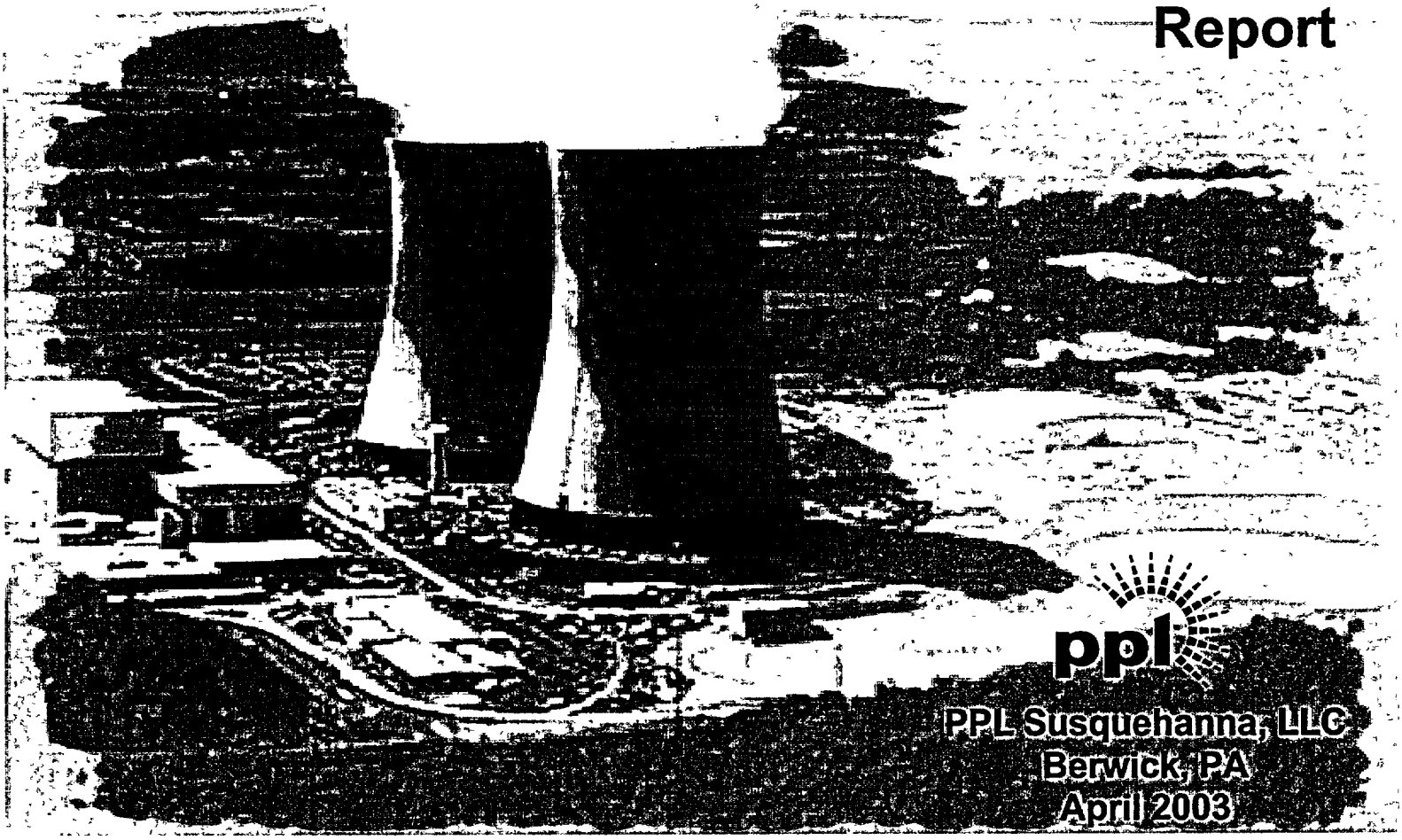
Susquehanna Steam Electric Station

Units 1 & 2

Radioactive Effluent and Waste Disposal Report

2002 Annual Report



ppl

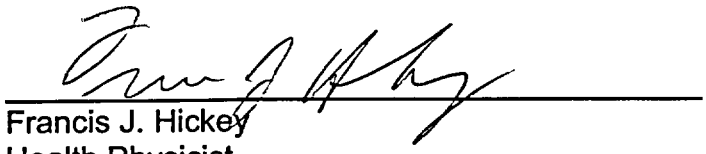
PPL Susquehanna, LLC
Berwick, PA
April 2003

SUSQUEHANNA STEAM ELECTRIC STATION

ANNUAL RADIOACTIVE EFFLUENT
AND
WASTE DISPOSAL REPORT

REPORT PERIOD: 01/01/02 - 12/31/02

Prepared by:



Francis J. Hickey
Health Physicist

Reviewed by:

Raymond E. Doebler
Chemistry Support Supervisor – SSES

Approved by:

Bruce E. Rhoads
Chemistry Supervisor - SSES

PPL Susquehanna, LLC
Susquehanna Steam Electric Station (NUCSA3)
769 Salem Blvd.
Berwick, Pennsylvania 18603

TABLE OF CONTENTS

LIST OF TABLES

LIST OF TABLES (cont.)

LIST OF TABLES (cont.)

LIST OF FIGURES

SECTION 1

INTRODUCTION AND SUPPLEMENTAL INFORMATION

INTRODUCTION

The submittal of the 2002 Annual Radioactive Effluent and Waste Disposal Report is in accordance with 10CFR50.36a. The enclosed information is consistent with the objectives outlined in the SSES ODCM and Process Control Program. The 2002 Annual Radioactive Effluent and Waste Disposal Report is in conformance with 10CFR50.36a and 10CFR50, Appendix I, Section IV.B.1.

The Susquehanna Steam Electric Station (SSES) is located in Salem Township, Luzerne County, Pennsylvania. It is on the west bank of the Susquehanna River, 8 km northeast of Berwick. The Station consists of two boiling water reactor generating units, each with about 1,100 MW net electrical capacity. The reactor and generating units were supplied by General Electric, while the Bechtel Corporation served as architect-engineer and constructor.

Construction of the Station began in the early 1970s. Fuel load began in Unit 1 in July of 1982. Initial criticality was achieved in the Unit 1 reactor on September 10, 1982. The reactor reached 100% power for the first time on February 4, 1983. Commercial operation of Unit 1 was declared on June 8, 1983. Initial criticality of Unit 2 occurred on May 8, 1984. Unit 2 was declared commercial on February 12, 1985.

Airborne effluents are released from the Susquehanna Station via five rooftop vents on the reactor building (see Figure 1-1). Each vent is continuously monitored, and a program of periodic sampling and analysis is conducted as specified in the plant Technical Requirements. All waterborne effluents are released in batch mode and are sampled and analyzed prior to release. Waterborne effluents from the site are released into the cooling tower blowdown line for dilution prior to release to the Susquehanna River (see Figure 1-2). Blowdown line flow rates are at least 5,000 gpm during periods of liquid radwaste release. The diluted effluent is introduced to the river by way of a perforated diffuser pipe placed on the river bed. The diffuser serves to rapidly and uniformly mix the station discharge with the main flow of the river.

This report presents a summary of the quantities of radioactive materials which were released from the Susquehanna Steam Electric Station during the period from January 1, 2002 to December 31, 2002. In addition, this report serves as a medium for notifying the US Nuclear Regulatory Commission staff of changes to the SSES Offsite Dose Calculation Manual (ODCM) and Solid Radioactive Waste Process Control Program (PCP) and documentation of any exceptions to the SSES effluent monitoring program which must be reported per Technical Requirements.

Airborne and waterborne radioactive effluent releases to the environment during the report period were sampled and analyzed in accordance with the Technical Requirements. All radioactive effluent releases were within the concentration and release limits specified in the Technical Requirements. Calculations and terms utilized in this report are those outlined in the SSES ODCM.

Section 1 contains supplemental information pertaining to effluents from the Susquehanna plant. Included are regulatory limits (Table 1-1), sampling and analysis methods, and characterization of the number and duration of batch and abnormal releases, if any.

Section 2 contains effluent and waste disposal data for the report period. Table 2-1 contains a summation of all airborne releases, grouped into the radionuclide categories of gases, particulates, iodines, and tritium. Average release rates are presented and compared to the applicable limits. Table 2-2 presents the activity totals of specific radionuclides in airborne effluents.

Waterborne effluents are summarized in Table 2-3. Average diluted concentrations are presented and compared to the applicable limits. Table 2-4 presents the release quantities of specific radionuclides in waterborne effluents over the report period. Figures present the Susquehanna River Monthly Average Flow Rates for 2002 and the SSES Monthly Liquid Radwaste Discharge Totals for 2002.

Table 2-5 contains estimates of the errors associated with the measurements involved in quantifying effluents. Sampling errors, counting errors, and errors associated with determining effluent flow rates and volumes all contribute to the total error of effluent measurements. Error estimates are presented for each category of radionuclide detected in airborne and waterborne effluents and solid wastes during the report period.

Tables 2-7 through 2-20 present a characterization of the solid radioactive waste shipped offsite during the report period. Included are the volumes and curie contents associated with each type of solid waste. An estimate of major nuclide composition is presented for each waste type, as well as the number of waste shipments from the site, how they were transported, and their final destination.

Section 3 presents meteorological data for 2002 including data recovery, joint frequency distribution of wind speed and direction, stability class distribution, and atmospheric dispersion estimates for selected locations.

Section 4 of this report contains an assessment of the calculated doses attributed to the reported radiological effluents for the calendar year. The Radioactive Effluent Tracking and Dose Assessment Software (RETDAS) computer code was used for calculation of doses from waterborne effluents. Site-specific parameters used in the calculations for the Danville receiver are shown in Table 4-1. The RETDAS code was also used for calculation of doses from airborne effluents. The calculated doses and direct radiation estimates can be used to estimate the doses to maximally exposed members of the public. Table 4-2 summarizes maximum calculated doses and dose commitments to members of the public from airborne and waterborne effluents and direct radiation. Table 4-3 presents calculated collective doses to members of the public within the Riverlands/Information Center Complex. Table 4-4 summarizes the calculated doses

for residences and other occupied areas within the SSES site boundary and nearest dairy.

Section 5 of this report documents changes to the Offsite Dose Calculation Manual and the Solid Radioactive Waste Process Control Program.

Section 6 presents a listing of cases (if any) in which airborne or waterborne effluent monitoring instrumentation was declared inoperable and was not restored to operability within the time period specified in Technical Requirements 3.11.1.4, 3.11.1.5 and 3.11.2.6 Action Statements. In addition, this section presents issues (if any) with the collection of milk or fresh leafy vegetables per Technical Requirement 3.11.4.1 and change due to the land use census per Technical Requirement 3.11.4.2.

Section 7 contains corrections (if any) to doses reported in previous Semiannual or Annual Effluent and Waste Disposal Reports.

Section 8 contains information on effluent and offsite dose from the systems classified as insignificant effluent pathways.

FIGURE 1-1

SSES AIRBORNE EFFLUENT RELEASE POINTS

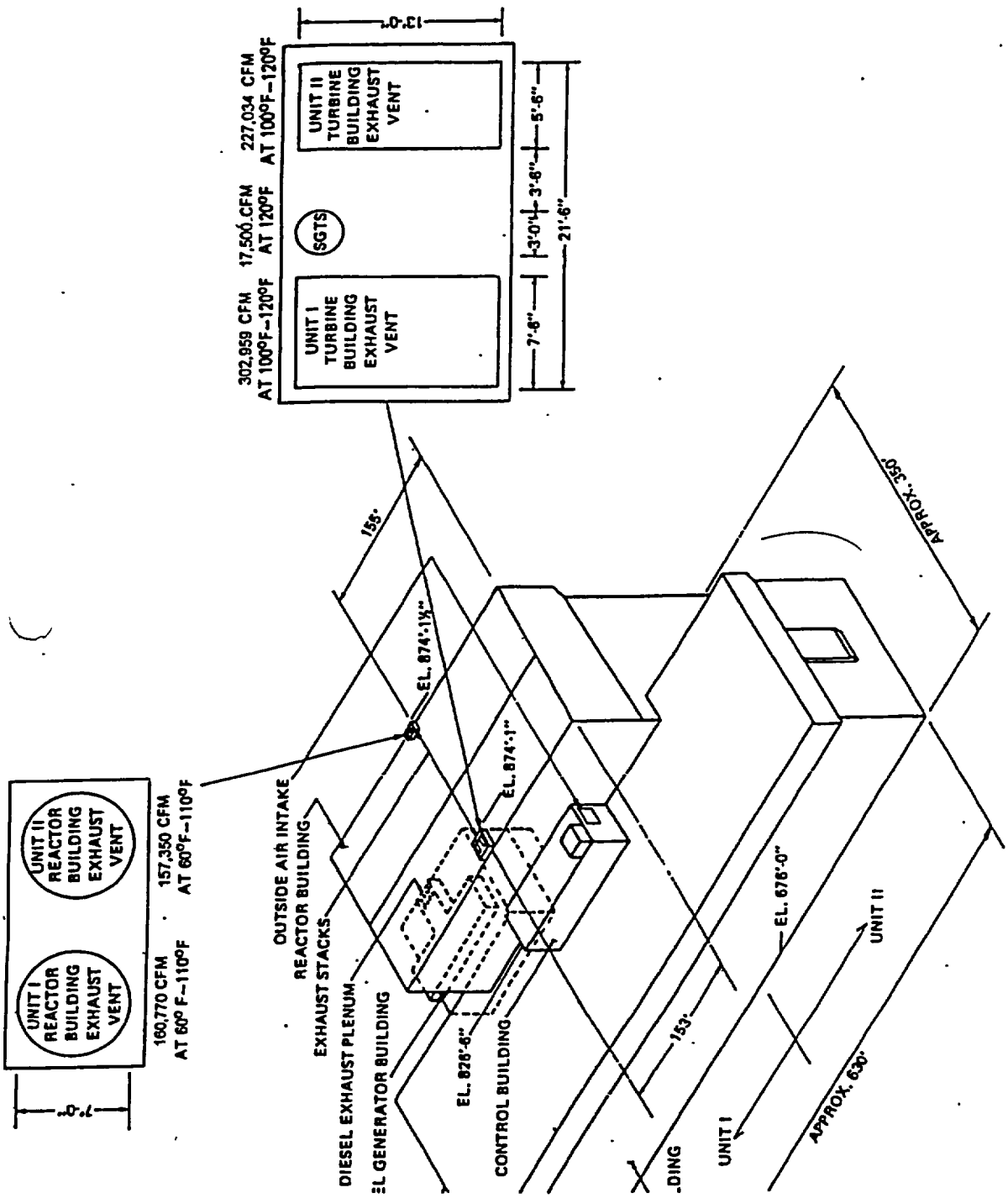
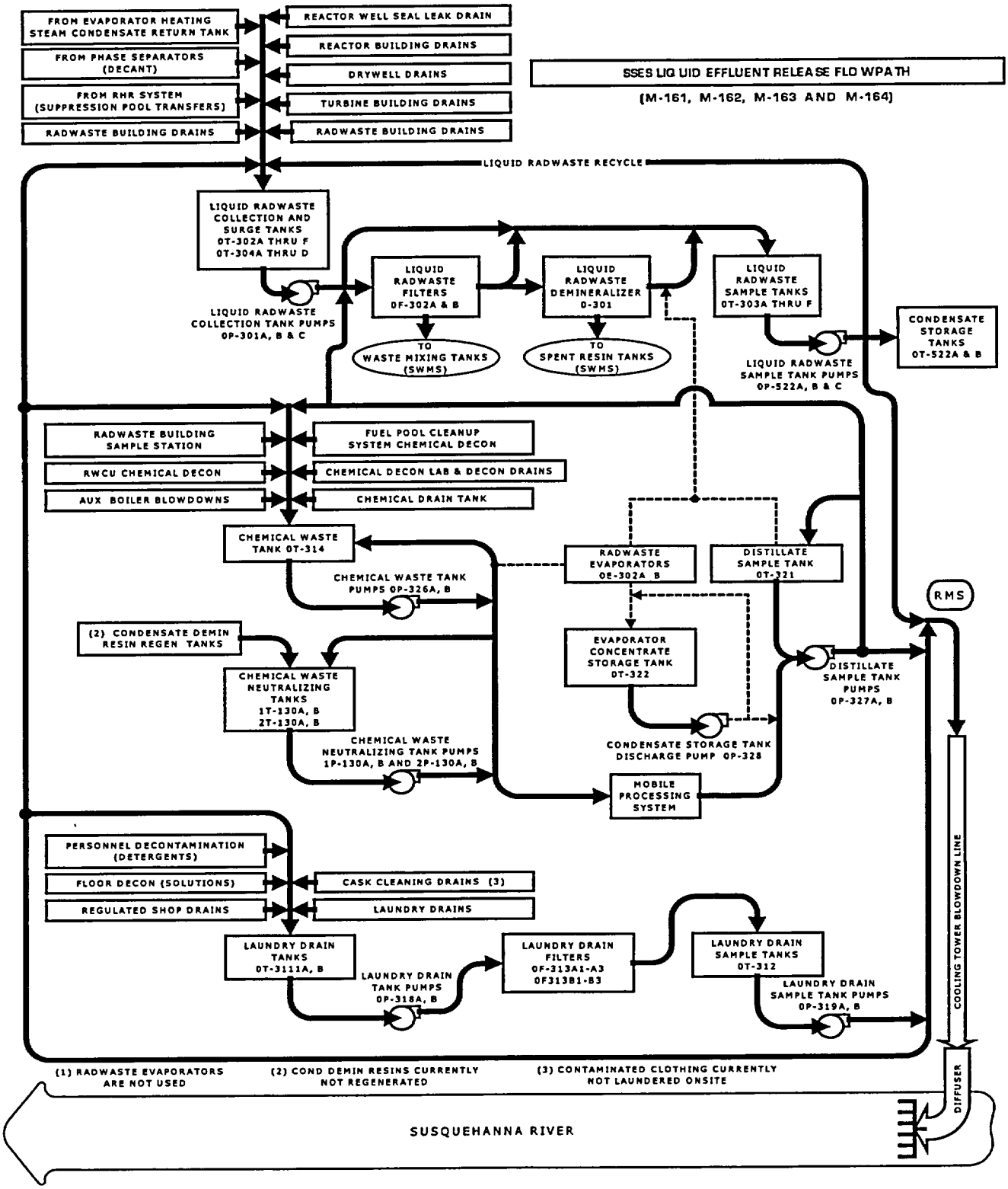


FIGURE 1-2
SSES WATERBORNE EFFLUENT PATHWAY



SUPPLEMENTAL INFORMATION

1. Regulatory Limits

Technical Requirements 3.11.1 and 3.11.2 outline requirements for release of radioactive liquid and gaseous effluents, respectively. Concentration of radioactive materials released in liquid effluents and dose or dose commitment resultant thereof are limited in unrestricted areas. Dose and dose rate due to radioactive materials released in gaseous effluents are limited in areas at or beyond the site boundary. Technical Requirement limits are listed in Table 1-1.

2. Maximum Permissible Concentrations in Waterborne Effluents

The concentration of radioactive material released in liquid effluents to unrestricted areas is limited to 10 times the concentrations specified in 10 CFR Part 20 Appendix B Table 2, Column 2, for radionuclides other than dissolved or entrained noble gases.

For dissolved or entrained noble gases, the concentration is limited to 2.0E-04 μCi/ml total activity (TRO 3.11.1.1).

3. Average Energy of Fission and Activation Gas

The Calculation of Noble Gas Effluent Average Energies E-Bar Beta and Gamma for 2002 resulted in an Annual E-Bar Beta value of 4.64E-01 and an E-Bar Gamma activity of 1.28.

4. Measurements and Approximations of Total Radioactivity

Analyses of specific radionuclides in effluent samples are used to evaluate the radioactive composition and concentration of effluents.

5. Methods of Quantifying Effluents

a. **Fission and Activation Gases**: Gas samples are routinely collected monthly and analyzed with a high resolution (HPGE) detector system which incorporates a data reduction program to determine radionuclide composition in terms of specific activity. Data tapes from the continuous vent monitors are used to determine the average concentration of noble gases. The high resolution (HPGE) isotopic scan is used to convert the continuous vent monitor activity to actual activity based on the determined nuclide mixture. The vent and sample flow rates are continuously monitored and the average flow rates for each vent are used to calculate the total activity released in a given time period. When the continuous monitors are out of service, manual

grab samples are taken from each vent once each eight hours (once each four hours for the standby gas treatment vent).

b. **Iodines**: Iodine is continuously collected on charcoal or silver zeolite cartridges via an isokinetic sampling assembly in each vent. Filters are normally exchanged once per week and analyzed on a high resolution (HPGE) system. The daily average flow rates for the vents and sample pumps are averaged for the duration of the sampling period and a ratio of vent flow rate to sample flow rate is determined. The ratio is used to determine the total activity of each isotope released during the time period in question. When the continuous monitors are out of service, iodine is continuously collected on charcoal cartridges attached to air samplers which draw directly from the affected rooftop vent(s) or from alternate sampling ports available on the sample lines.

c. **Particulates**: Particulates are continuously collected via an isokinetic sampling assembly in each vent. Filters are normally exchanged once per week and analyzed on a high resolution (HPGE) system. Flow rate corrections are performed as for iodines. When the continuous vent monitors are out of service, particulates are continuously collected directly from the affected rooftop vent(s) or from alternate sampling ports available on the sample lines.

d. **Tritium**: Airborne tritium is collected monthly via bubbler sampler. The sample is collected for one hour at a flow rate of approximately 1000 cc/min. Tritium activity in the bubbler sample is determined by liquid scintillation counting. The liquid sample tritium concentration is converted to air concentration by volume proportion, then compared to the Technical Requirement Table (TRO) 3.11.2.1.-1 Lower Limit of Detection (1 E-6 μCi/cc).

e. **Waterborne Effluents**: Each tank of liquid radwaste is sampled and analyzed for principal gamma emitters prior to release. Each sample tank is recirculated for a sufficient amount of time prior to sampling to ensure that a representative sample is obtained. Samples are analyzed on a high resolution (HPGE) system and release permits are generated based on the values obtained from the isotopic analysis and the most recent values for tritium, gross alpha, iron-55, and strontium-89 and -90. An aliquot based on release volume is saved and added to monthly and quarterly composite containers. The monthly tritium analysis is done in-house. The monthly liquid radwaste composite sample is also analyzed offsite for P-32. The quarterly composite is sent to a vendor laboratory for iron-55, strontium-89 and -90, and gross alpha analyses.

The concentration of each radionuclide in each batch is decay-corrected from the time of counting to the midpoint of the release period, and is then multiplied by the volume of the batch to determine the total quantity of each

nuclide released in each batch. The isotopic totals for each are summed to determine the total source term for the report period.

TABLE 1-1

1. **TECHNICAL REQUIREMENT LIMITS**

   A. **NOBLE GASES:**

      1. ≤500 mrem/year - TOTAL BODY
         ≤3000 mrem/year - SKIN

         - dose rate limit at and beyond the site boundary
           (TRO 3.11.2.1)

      2. ≤5 mrad - AIR GAMMA
         ≤10 mrad - AIR BETA

         - quarterly air dose limits per reactor unit at and beyond the site boundary
           (TRO 3.11.2.2a)

      3. ≤10 mrad - AIR GAMMA
         ≤20 mrad - AIR BETA

         - annual air dose limits per reactor unit at and beyond the site boundary
           (TRO 3.11.2.2.b)

   B. **AIRBORNE I-131, I-133, TRITIUM, PARTICULATES WITH HALF-LIVES > 8 DAYS:**

      1. ≤1500 mrem/year - ORGAN
         (inhalation pathways only)

         - dose rate limit at and beyond the site boundary
           (TRO 3.11.2.1.II.A)

      2. ≤7.5 mrem - ORGAN

         - quarterly dose limit per reactor unit at and beyond the site boundary
           (TRO 3.11.2.3.a)

      3. ≤15 mrem - ORGAN

         - annual dose limit per reactor unit at and beyond the site boundary
           (TRO 3.11.2.3.b)

C. **LIQUID EFFLUENTS**:

1. ≤1.5 mrem - TOTAL BODY
   ≤5.0 mrem ORGAN
   - quarterly dose limits per SSES unit (TRO 3.11.1.2.a)

2. ≤3.0 mrem - TOTAL BODY
   ≤10.0 mrem - ORGAN
   - annual dose limits per SSES unit (TRO 3.11.1.2.b)

D. **AIRBORNE EFFLUENT: BASES FOR PERCENT OF APPLICABLE TECHNICAL REQUIREMENT LIMIT**

Fission and Activation Gases

A derived release rate limit based on the Technical Requirement (TRO 3.11.2.1.I.A) limit of 500 mrem/yr was calculated from the expected mix of noble gas radionuclides presented in Table 4.4 of the SSES Final Environmental Statement (NUREG-0564). The limit is 8.51E+05 μCi/min (1.42E+04 μCi/sec).

Iodines

A derived release rate limit based on the Technical Requirement (TRO 3.11.2.1.II.A) limit of 1500 mrem/yr from I-131, I-133, tritium and particulates with half-lives greater than 8 days was calculated from the annual release quantity of I-131 provided in Table 4.4 of the SSES Final Environmental Statement (NUREG-0564). The limit is 1.04E+02 μCi/min (1.73E+00 μCi/sec).

Particulates

A derived release rate limit based on the Technical Requirement (TRO 3.11.2.1.II.A) limit of 1500 mrem/yr from I-131, I-133, tritium and particulates with half-lives greater than 8 days was calculated based on the expected mix of particulate radionuclides presented in Table 4.4 of the SSES Final Environmental Statement (NUREG-0564). The limit is 7.72E+02 μCi/min (1.29E+01 μCi/sec).

Tritium

A derived release rate was calculated based on the 10 CFR 20, Appendix B, Table 2, Column 1, Effluent Concentration Limit for tritium (1.0E-07 μCi/cc) to unrestricted areas. A relative concentration of 4.1E-05 sec/m^3 was assumed. The limit is 1.46E+05 μCi/min (2.44E+03 μCi/sec).

E. WATERBORNE EFFLUENT: BASES FOR PERCENT OF APPLICABLE TECHNICAL REQUIREMENT LIMIT

Fission and Activation Products

Concentrations of fission and activation products in liquid effluent from radwaste effluent are determined for each batch prior to release. Each isotope concentration is compared to ten times the 10CFR20 Appendix B, Table 2, Column 2 Effluent Concentration Values. No Technical Requirement limit for the total concentration of fission and activation products in liquid effluents is applicable for this category.

Tritium

Liquid effluent tritium concentrations are compared to ten times the 10 CFR 20 Appendix B, Table 2, Column 2, Effluent Concentration value of 1.0E-03 μCi/ml to unrestricted areas.

Dissolved and Entrained Gases

Liquid effluent concentrations for dissolved and entrained gases are compared to the limiting value for a noble gas of 2.0E-04 μCi/ml.

SECTION 2

EFFLUENT AND WASTE DISPOSAL DATA

Airborne Effluents

Summaries of the radionuclide total curie activities and average release rates are included in Tables 2-1 and 2-2.

1. Number of Batch Releases:	0
2. Total Time Period for Batch Release:	NA
3. Maximum Time Period for a Batch Release:	NA
4. Average Time Period for a Batch Release:	NA
5. Minimum Time Period for a Batch Release:	NA

Abnormal Releases

1. Number of Releases	0
2. Total Activity Released	NA

If a radionuclide was not detected, zero activity was used for that isotope in dose calculations. A zero activity indicates that no activity was positively detected in any sample when samples were analyzed with techniques which achieved the required Lower Limits of Detection (LLD) as specified in the SSES Technical Requirement (TRO) Table 3.11.2.1-1, Radioactive Gaseous Effluent Sampling and Analysis Program. In all cases, these LLDs were less than the levels required by Technical Requirements. The following are typical LLDs.

Radionuclide	LLD (μCi/cc)
Kr-87	4.6 E-08
Kr-88	5.3 E-08
Xe-133	5.4 E-08
Xe-133m	1.3 E-07
Xe-135	1.5 E-08
Xe-135m	5.0E-08
Xe-138	1.2 E-07
Mn-54	2.9 E-14
Fe-59	2.8 E-14
Co-58	1.8 E-14
Co-60	3.8 E-14
Zn-65	4.4 E-14
Mo-99	3.3 E-13
Cs-134	2.4 E-14

Radionuclide	LLD (μCi/cc)
Cs-137	2.1 E-14
Ce-141	1.5 E-14
Ce-144	7.0 E-14
I-131	4.4 E-14
Sr-89	2.0 E-15
Sr-90	3.0 E-16
H-3	2.6 E-08
Gross Alpha	5.0 E-16

TABLE 2-1

ANNUAL EFFLUENT AND WASTE DISPOSAL REPORT (2002)
AIRBORNE EFFLUENT - SUMMATION OF ALL RELEASES

A. Fission and Activation Gas	Unit	First Quarter	Second Quarter	Third Quarter	Fourth Quarter
Total Release	Ci	0	0	0	9.68E+00
Average Release Rate for Period	μCi/sec	0	0	0	1.22E+00
% of TRM Limit	%	0	0	0	8.6E-03

B. Iodines

Total I-131	Ci	0	0	0	0
Total I-133	Ci	0	0	0	0
Average Release Rate for Period	μCi/sec	0	0	0	0
Percent TRM Limit	%	0	0	0	0

C. Particulate

Particulate with Half-Life >8 Days	Ci	2.43E-03	1.32E-03	4.42E-04	2.11E-03
Average Release Rate for Period	μCi/sec	3.13E-04	1.68E-04	5.56E-05	2.65E-04
Percent TRM Limit	%	2.43E-03	1.31E-03	4.32E-04	2.06E-03
Gross Alpha Radioactivity	Ci	0	3.33E-06	2.10E-06	7.74E-06

D. Tritium

Total Release	Ci	4.32E+01	3.10E+01	4.53E+01	1.74E+01
Average Release Rate for Period	μCi/sec	5.55E+00	3.95E+00	5.70E+00	2.19E+00
Percent TRM Limit	%	2.28E-01	1.62E-01	2.34E-01	8.98E-02

TABLE 2-2

ANNUAL EFFLUENT AND WASTE DISPOSAL REPORT (2002)
AIRBORNE EFFLUENT

Nuclides Released	Unit	Releases in Continuous Mode			
		First Quarter	Second Quarter	Third Quarter	Fourth Quarter
A. Fission and Activation Gases					
Ar-41	Ci	0	0	0	9.68E+00
Kr-85	Ci	0	0	0	0
Kr-85m	Ci	0	0	0	0
Kr-87	Ci	0	0	0	0
Kr-88	Ci	0	0	0	0
Xe-133	Ci	0	0	0	0
Xe-133m	Ci	0	0	0	0
Xe-135	Ci	0	0	0	0
Xe-135m	Ci	0	0	0	0
Xe-138	Ci	0	0	0	0
Total for Period	Ci	0	0	0	9.68E+00
B. Iodines					
I-131	Ci	0	0	0	0
I-133	Ci	0	0	0	0
I-135	Ci	0	0	0	0
Total for Period	Ci	0	0	0	0
C. Particulate					
Cr-51	Ci	1.54E-03	6.65E-04	2.94E-04	8.06E-04
Mn-54	Ci	5.82E-04	4.49E-04	1.30E-04	4.57E-05
Fe-59	Ci	1.41E-04	9.08E-05	0	0
Co-58	Ci	3.50E-05	2.12E-05	0	0
Co-60	Ci	1.35E-04	6.58E-05	1.46E-05	1.26E-03
Zn-65	Ci	0	0	0	0
Sr-89	Ci	0	0	0	0
Sr-90	Ci	1.28E-07	2.88E-05	6.01E-07	0
Cs-134	Ci	0	0	0	0
Cs-137	Ci	0	0	3.23E-06	0
Ce-141	Ci	0	0	0	0
Ce-144	Ci	0	0	0	0
AG-110M	Ci	2.72E-07	0	0	2.05E-06
NB-95	Ci	0	0	0	0
*AS-76	Ci	1.40E-03	0	0	4.58E-04
*NA-24	Ci	8.08E-05	0	0	0
*TC-99M	Ci	1.40E-04	0	3.83E-05	0
Ba-La-140	Ci	0	0	0	0
Total for Period	Ci	2.43E-03	1.32E-03	4.42E-04	2.11E-03

* Particulate with less than eight (8) day half-life.

Waterborne Effluents

Summaries of the radionuclide total curie activities, average diluted concentrations, and percent of applicable Technical Requirement limits are included in Tables 2-3 and 2-4.

	Batch Releases*	Qtr. 1	Qtr. 2	Qtr. 3	Qtr. 4	Annual
1.	Number of Batch Releases	18	20	19	26	83
2.	Total Time Period for a Batch Release	3.27E+03	7.50E+03	3.49E+03	4.78E+03	1.90E+04
3.	Maximum Time Period for a Batch Release	5.25E+02	1.61E+03	2.91E+02	2.93E+02	1.61E+03
4.	Average Time Period for a Batch Release	1.82E+02	3.75E+02	1.83E+02	1.84E+02	2.29E+02
5.	Minimum Time Period for a Batch Release	2.10E+01	2.30E+01	2.50E+01	2.80E+01	2.10E+01
6.	Average Cooling Tower Blowdown Flow Rate During Periods of Release	6.25E+03	7.32E+03	1.20E+04	7.44E+03	8.03E+03
7.	Susquehanna River Flow Rate	6.75E+06	1.09E+07	1.05E+06	6.94E+06	6.40E+06

*Units of time and flow are expressed in minutes and gallons per minute (gpm), respectively.

	Abnormal Releases				
1.	Number of Releases	0	0	0	0
2.	Volume Released	N/A	N/A	N/A	N/A
3.	Total Activity Released	N/A	N/A	N/A	N/A

If a radionuclide was not detected, zero activity was used for that isotope in dose calculations. A zero activity indicates that no activity was positively detected in any sample when samples were analyzed with techniques which achieved the required Lower Limits of Detection (LLD) as specified in the SSES Technical Requirement 4.11.1.1.1-1, Radioactive Liquid Waste Sampling and Analysis Program. In all cases, these LLDs were less than the levels required by Technical Requirements. The following are typical LLDs.

Radionuclide	LLD (μCi/ml)
Mn-54	4.5 E-08
Fe-59	5.0 E-08
Co-58	2.4 E-08
Co-60	5.4 E-08
Zn-65	4.9 E-08
Mo-99	1.7 E-07
I-131	2.0 E-08
Cs-134	2.2 E-08

Radionuclide	LLD (μCi/ml)
Cs-137	2.6 E-08
Ce-141	3.2 E-08
Ce-144	1.3 E-07
Sr-89	4.0 E-08
Sr-90	4.0 E-09
Fe-55	1.0 E-06
H-3	4.6 E-06
Gross Alpha	3.0 E-08

TABLE 2-3

ANNUAL EFFLUENT AND WASTE DISPOSAL REPORT (2002)
WATERBORNE EFLUENT - SUMMATION OF ALL RELEASES

	Unit	First Quarter	Second Quarter	Third Quarter	Fourth Quarter
A. Fission and Activation Products					
1. Total Release (excluding: Tritium, Ent. Gases, Alpha)	Ci	1.03E-02	1.82E-03	1.50E-03	1.62E-02
2. Average Diluted Concentration During Period	µCi/ml	1.34E-07	8.74E-09	9.46E-09	1.20E-07
B. Tritium					
1. Total Release	Ci	4.02E+00	1.77E+01	1.69E+01	2.75E+01
2. Average Diluted Concentration During Period	µCi/ml	5.19E-05	8.54E-05	1.06E-04	2.04E-04
3. Percent of Applicable Limit (1.0E-2)	%	5.19E-01	8.54E-01	1.06E+00	2.04E+00
C. Dissolved and Entrained Gases					
1. Total Release	Ci	4.99E-05	4.13E-05	6.83E-05	1.35E-04
2. Average Diluted Concentration During Period	µCi/ml	6.45E-10	1.99E-10	4.31E-10	1.00E-09
3. Percent of Applicable Limit (2.0E-4)	%	3.23E-04	9.93E-05	2.15E-04	5.01E-04
D. Gross Alpha Radioactivity					
1. Total Release	Ci	1.61E-06	1.14E-07	1.75E-06	0
E. Volume of Water Released (Prior to Dilution)	Gallons	8.80E+04	2.96E+05	2.88E+05	3.91E+05
	Liters	3.33E+05	1.12E+06	1.09E+06	1.48E+06
F. Volume of Dilution Water Used During Period of Release	Gallons	2.04E+07	5.47E+07	4.17E+07	3.51E+07
	Liters	7.70E+07	2.07E+08	1.58E+08	1.33E+08
G. Volume of Dilution Water Used Over Entire Period	Gallons	6.63E+08	1.12E+09	1.50E+09	7.76E+08
	Liters	2.51E+09	4.24E+09	5.69E+09	2.94E+09

TABLE 2-4

ANNUAL EFFLUENT AND WASTE DISPOSAL REPORT (2002)
WATERBORNE EFFLUENT

		Releases in Batch Mode			
Nuclides Released	Unit	First Quarter	Second Quarter	Third Quarter	Fourth Quarter
A. Fission and Activation Products					
F-18	Ci	0	0	0	0
Na-24	Ci	0	0	0	0
P-32	Ci	3.00E-05	6.33E-07	0	0
Cr-51	Ci	3.58E-03	7.00E-04	3.74E-05	7.22E-03
Mn-54	Ci	9.16E-04	7.18E-04	8.39E-04	5.21E-03
Fe-55	Ci	4.36E-03	0	9.47E-05	2.00E-03
Fe-59	Ci	1.88E-05	6.67E-05	3.52E-05	4.91E-04
Co-58	Ci	1.17E-04	2.69E-05	9.24E-06	1.39E-04
Co-60	Ci	1.32E-03	3.04E-04	4.85E-04	1.16E-03
Zn-65	Ci	4.28E-06	0	0	0
As-76	Ci	0	0	0	0
Rb-86	Ci	0	0	0	0
Sr-89	Ci	0	0	0	0
Sr-90	Ci	0	0	0	0
Sr-92	Ci	0	0	0	0
Nb-95	Ci	0	0	0	0
Mo-99	Ci	0	0	0	0
Ag-110m	Ci	0	0	0	0
Cs-137	Ci	0	0	0	0
Total for Period	**Ci**	**1.03E-02**	**1.82E-03**	**1.50E-03**	**1.62E-02**
B Tritium					
Total for Period	**Ci**	**4.02E+00**	**1.77E+01**	**1.69E+01**	**2.75E+01**
C. Dissolved and Entrained Gases					
Ar-41	Ci	0	0	0	0
Kr-85	Ci	0	0	0	0
Kr-86m	Ci	0	0	0	0
Kr-87	Ci	0	0	0	0
Kr-88	Ci	0	0	0	0
Xe-131m	Ci	0	0	0	0
Xe-133m	Ci	0	0	0	0
Xe-133	Ci	4.54E-05	2.33E-05	1.38E-05	7.60E-05
Xe-135m	Ci	0	0	0	4.97E-06
Xe-135	Ci	4.48E-06	1.80E-05	5.45E-05	5.40E-05
Total for Period	**Ci**	**4.99E-05**	**4.13E-05**	**6.83E-05**	**1.35E-04**

Figure 2-1

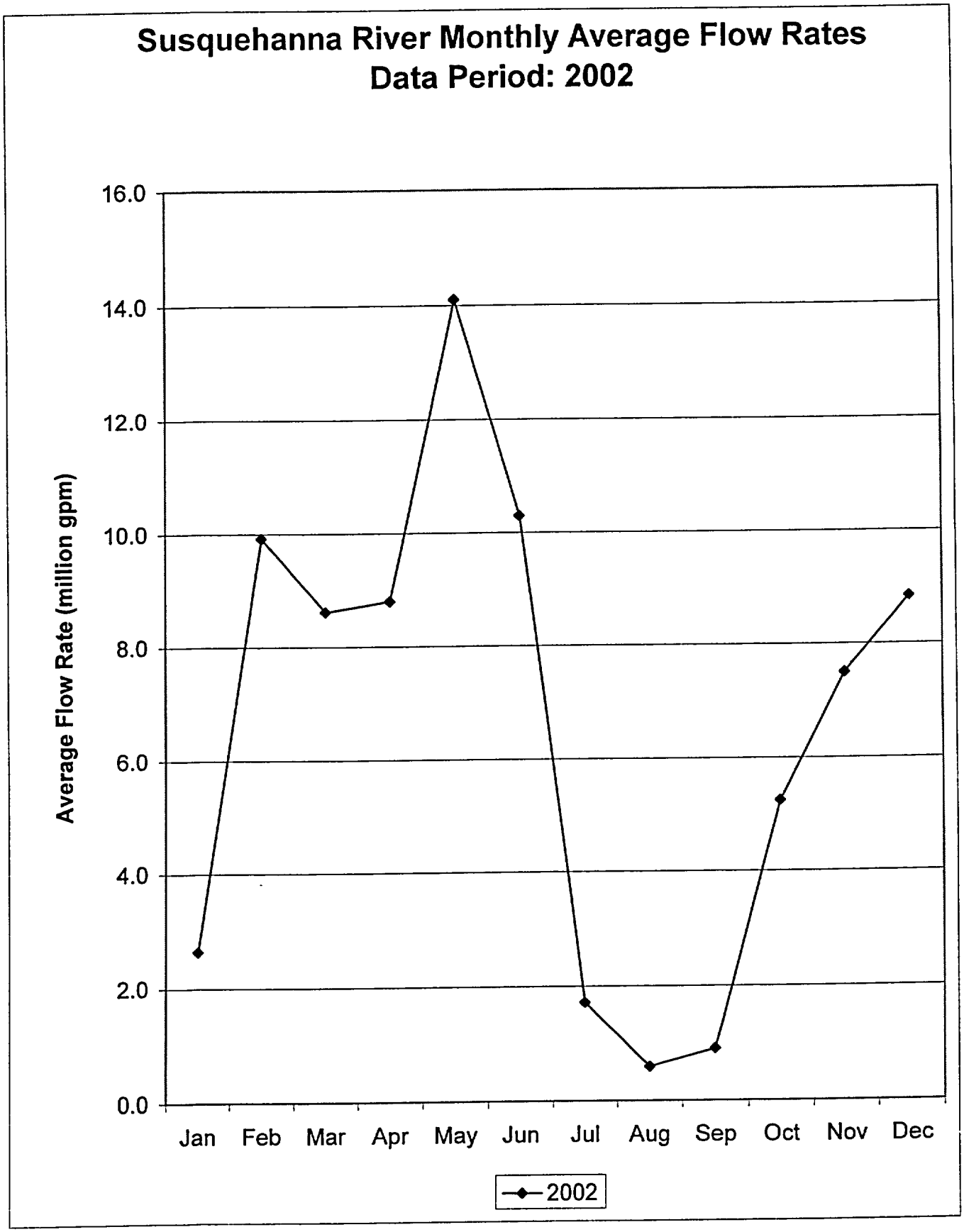

Susquehanna River Monthly Average Flow Rates
Data Period: 2002
Average Flow Rate (million gpm)
16.0
14.0
12.0
10.0
8.0
6.0
4.0
2.0
0.0
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
2002

Figure 2-2

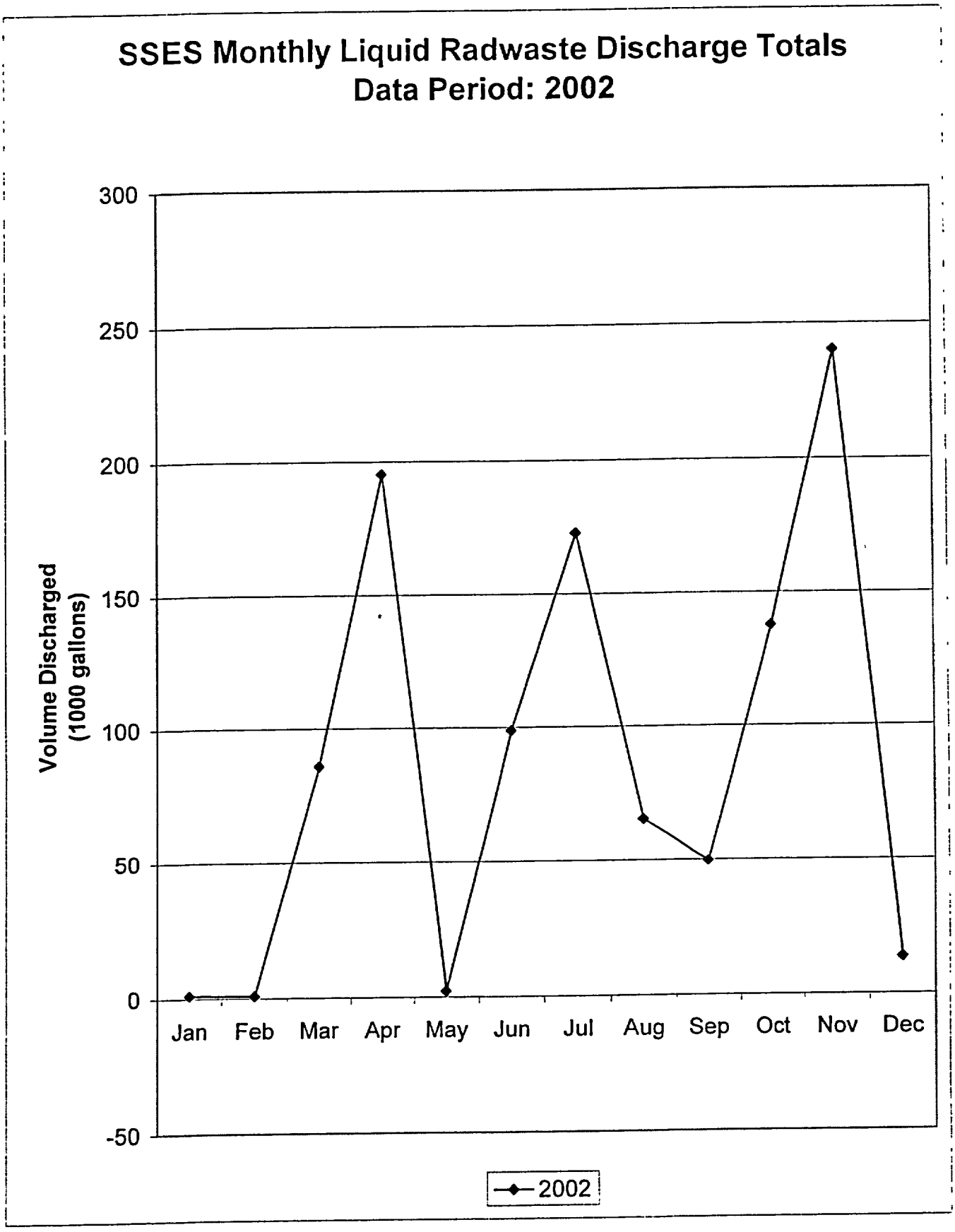

SSES Monthly Liquid Radwaste Discharge Totals
Data Period: 2002
Volume Discharged (1000 gallons)
300
250
200
150
100
50
0
-50
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
2002

TABLE 2-5

ANNUAL EFFLUENT AND WASTE DISPOSAL REPORT
ESTIMATED TOTAL ERRORS ASSOCIATED WITH
EFFLUENTS MEASUREMENTS
DATA PERIOD: JANUARY 1, 2002 - DECEMBER 31, 2002

	MEASUREMENT	ESTIMATED TOTAL ERROR
1.	**Airborne Effluents**	
a.	Fission and Activation Gases	15.9%
b.	I-131	13.3%
c.	Particulates (incl. Gross Alpha)	15.8%
d.	Tritium	13.6%
2.	**Waterborne Effluents**	
a.	Fission and Activation Products	5.0%
b.	Tritium	3.3%
c.	Dissolved and Entrained Gases	8.4%
d.	Gross Alpha Activity	6.0%
e.	Volume of Waste Released (Prior to Dilution)	5.0%
f.	Volume of Dilution Water Used During Period	15.0%
		ESTIMATED MAXIMUM MEASUREMENT ERROR
3.	**Solid Wastes**	
a.	Dry Active Waste (DAW) - Class A Strong Tight Container (Compacted)	±25%
b.	Bead Resin/Charcoal – Class A HIC (Pyrolysis)	±25%
c.	Condensate Filtration System (CFS) Filters - Class A Strong Tight Container (compacted)	±25%
d.	Waste Oil – Class A (Fuel Blending for Co-Generation)	±25%
e.	RWCU Filter Media – Class A HIC (Dewatered)	±25%
f.	Condensate Demineralizer/Radwaste Demineralizer - Class A HIC (Pyrolysis)	±25%

	MEASUREMENT	ESTIMATED MAXIMUM MEASUREMENT ERROR
3.	**Solid Wastes (cont.)**	
g.	LRW Filter Media – Class A HIC (Dewatered)	±25%
h.	Condensate Demineralizer/Radwaste Demineralizer - Class B HIC (Pyrolysis)	±25%
i.	Cartridge Filters – Class C HIC (non-processed)	±25%
j.	Dry Active Waste (DAW) – Class C HIC (Non-Processed)	±25%
k.	RWCU Filter Media – Class B HIC (Dewatered)	±25%
l.	Asbestos – Class A Strong Tight Container (compacted)	±25%
m.	Ash-Class A Strong Tight Container (Incineration)	±25%
n.	LRW Filter Media – Class A HIC (Pyrolysis)	±25%
o.	LRW Filter Media – Class B HIC (Pyrolysis)	±25%
p.	Phosphoric Acid – Class A Drums (Incineration)	±25%
q.	LRW Filter Media – Class C HIC (Pyrolysis)	±25%

SUSQUEHANNA STEAM ELECTRIC STATION

RADIOACTIVE WASTE REPORT

ANNUAL EFFLUENT AND WASTE DISPOSAL REPORT

SOLID RADIOACTIVE WASTE

DATA PERIOD: JANUARY 1, 2002 - DECEMBER 31, 2002

PREPARED BY: _____
MICHAEL C. MICCA - HEALTH PHYSICIST

APPROVED BY: _____
JEFFREY F. FRITZEN / RADIOLOGICAL OPERATIONS SUPERVISOR

REPORT NOTES

1. All activities reported in millicuries (mCi) unless otherwise noted.

2. Reported activities, as indicated with the (<) sign, are comprised in whole or part of MDL values.

3. Estimated maximum measurement error is ±25%.

TABLE 2-6

WASTE DISPOSITIONS

Data Period: January 1, 2002 - December 31, 2002

A. SOLID WASTE SHIPPED OFFSITE FOR BURIAL OR DISPOSAL

Number of Shipments	Mode of Transportation	Destination
4	Truck	Barnwell, SC

B. IRRADIATED FUEL SHIPMENTS

Number of Shipments	Mode of Transportation	Destination
None		

TABLE 2-7

Annual Waste Release Summary Report

Year: 2002
Class: A Volume Reduction Vendor: No
Source: Liquid Radwaste Filter Media
Container: HIC (High Integrity Container)
Process: Dewatered

Nuclides	Activity (mCi)	% of Total
C-14	1.030E+01	0.00 %
CE-144	1.100E+01	0.00 %
CO-58	1.630E+04	0.99 %
CO-60	5.490E+04	3.33 %
CR-51	1.160E+05	7.03 %
CS-137	1.140E+01	0.00 %
FE-55	1.020E+06	61.81 %
FE-59	9.120E+04	5.53 %
H-3	3.110E+01	0.00 %
I-129	< 1.270E-04	0.00 %
MN-54	3.460E+05	20.97 %
NB-95	1.390E+03	0.08 %
NI-63	9.910E+02	0.06 %
SB-124	2.990E+03	0.18 %
SR-90	1.060E+00	0.00 %
TC-99	< 4.170E-06	0.00 %
ZN-65	3.130E+02	0.02 %
Total Activity (Ci)	1650.149	100.00 %
Container Volume	132.400 ft3	3.749 m3

TABLE 2-8

Annual Waste Release Summary Report

Year: 2002
Class: A Volume Reduction Vendor: No
Source: RWCU Filter Media
Container: HIC (High Integrity Container)
Process: Dewatered

Nuclides	Activity (mCi)	% of Total
C-14	1.310E+02	0.01 %
CE-144	4.700E+01	0.01 %
CO-58	7.290E+03	0.81 %
CO-60	2.180E+05	24.26 %
CR-51	2.330E+04	2.59 %
CS-137	2.390E+02	0.03 %
FE-55	6.690E+04	7.44 %
FE-59	1.410E+04	1.57 %
H-3	2.770E+01	0.00 %
I-129	< 4.740E-05	0.00 %
MN-54	3.950E+05	43.95 %
NB-95	2.640E+03	0.29 %
NI-63	1.230E+03	0.14 %
PU-241	4.280E+02	0.05 %
SB-125	1.640E+05	18.25 %
SR-90	5.280E+00	0.00 %
TC-99	< 1.800E-04	0.00 %
ZN-65	5.360E+03	0.60 %
Total Activity (Ci)	898.698	100.00 %
Container Volume	132.400 ft3	3.749 m3

TABLE 2-9

Annual Waste Release Summary Report

Year: 2002
Class: A
Source: Asbestos
Container: Strong Tight Container
Process: Compacted

Volume Reduction Vendor: Yes

Nuclides	Activity (mCi)	% of Total
C-14	7.000E-04	0.00 %
CE-144	1.260E-02	0.06 %
CO-58	4.100E-02	0.20 %
CO-60	2.140E+00	10.43 %
CS-137	4.600E-03	0.02 %
FE-55	1.503E+01	73.29 %
FE-59	7.460E-02	0.36 %
H-3	5.200E-03	0.03 %
I-129	4.000E-04	0.00 %
MN-54	3.148E+00	15.35 %
NI-59	3.100E-03	0.02 %
NI-63	3.960E-02	0.19 %
SB-125	7.900E-03	0.04 %
SR-89	1.000E-04	0.00 %
SR-90	2.000E-04	0.00 %
TC-99	< 0.000E+00	0.00 %
Total Activity (Ci)	0.021	100.00 %
Container Volume	3.600 ft3	0.102 m3

TABLE 2-10

Annual Waste Release Summary Report

Year: 2002
Class: A
Source: Ash
Container: Strong Tight Container
Process: Incineration
Volume Reduction Vendor: Yes

Nuclides	Activity (mCi)	% of Total
AG-110M	6.100E-03	0.00 %
C-14	1.110E-01	0.00 %
CE-144	1.627E+00	0.06 %
CO-58	5.597E+00	0.20 %
CO-60	3.347E+02	11.79 %
CR-51	1.580E-02	0.00 %
CS-137	6.563E-01	0.02 %
FE-55	2.063E+03	72.65 %
FE-59	7.202E+00	0.25 %
H-3	3.763E+00	0.13 %
I-129	6.510E-02	0.00 %
MN-54	4.113E+02	14.49 %
NI-59	4.795E-01	0.02 %
NI-63	5.819E+00	0.20 %
PU-238	< 0.000E+00	0.00 %
PU-239	< 0.000E+00	0.00 %
PU-241	3.060E-02	0.00 %
SB-125	9.832E-01	0.03 %
SR-89	1.060E-02	0.00 %
SR-90	2.900E-02	0.00 %
TC-99	1.040E-02	0.00 %
ZN-65	3.923E+00	0.14 %
Total Activity (Ci)	2.839	100.00 %
Container Volume	38.431 ft3	1.088 m3

TABLE 2-11

Annual Waste Release Summary Report

Year: 2002
Class: A Volume Reduction Vendor: Yes
Source: Bead Resin/Charcoal
Container: HIC (High Integrity Container)
Process: Pyrolysis

Nuclides	Activity (mCi)	% of Total
C-14	3.237E-02	0.01 %
CE-144	1.734E-02	0.00 %
CO-58	5.167E+00	1.25 %
CO-60	1.212E+02	29.35 %
CS-137	2.434E-02	0.01 %
FE-55	1.453E+02	35.16 %
H-3	7.762E+01	18.79 %
I-129	8.479E-03	0.00 %
MN-54	6.125E+01	14.83 %
NI-59	8.330E-03	0.00 %
NI-63	2.373E+00	0.57 %
PU-239	1.100E-05	0.00 %
PU-241	3.120E-03	0.00 %
SR-89	1.020E-01	0.02 %
SR-90	4.490E-04	0.00 %
TC-99	3.405E-03	0.00 %
Total Activity (Ci)	0.413	100.00 %
Container Volume	31.990 ft3	0.906 m3

TABLE 2-12

Annual Waste Release Summary Report

Year: 2002
Class: A
Source: CFS Filters
Container: Strong Tight Container
Process: Compacted
Volume Reduction Vendor: Yes

Nuclides	Activity (mCi)	% of Total
C-14	1.559E+00	0.03 %
CE-144	3.120E-02	0.00 %
CM-244	< 0.000E+00	0.00 %
CO-58	5.313E-01	0.01 %
CO-60	3.423E+02	6.80 %
CS-134	4.076E-01	0.01 %
CS-137	4.693E-01	0.01 %
FE-55	4.435E+03	88.04 %
FE-59	1.870E-02	0.00 %
H-3	3.366E+00	0.07 %
I-129	1.000E-04	0.00 %
MN-54	2.474E+02	4.91 %
NI-59	7.000E-04	0.00 %
NI-63	6.528E+00	0.13 %
PU-238	< 0.000E+00	0.00 %
PU-239	< 0.000E+00	0.00 %
PU-241	4.990E-02	0.00 %
SB-125	1.900E-03	0.00 %
SR-89	1.700E-03	0.00 %
SR-90	1.220E-02	0.00 %
TC-99	< 0.000E+00	0.00 %
Total Activity (Ci)	5.037	100.00 %
Container Volume	61.700 ft3	1.747 m3

TABLE 2-13

Annual Waste Release Summary Report

Year: 2002
Class: A Volume Reduction Vendor: Yes
Source: Condensate Demineralizer / Radwaste Demineralizer
Container: HIC (High Integrity Container)
Process: Pyrolysis

Nuclides	Activity (mCi)	% of Total
AM-241	1.620E-04	0.00 %
C-14	1.070E+02	0.45 %
CE-144	3.081E-01	0.00 %
CM-244	1.406E-03	0.00 %
CO-58	1.055E+02	0.44 %
CO-60	2.386E+03	9.97 %
CR-51	3.248E+02	1.36 %
CS-137	2.150E+00	0.01 %
FE-55	1.813E+04	75.79 %
FE-59	7.203E+01	0.30 %
H-3	4.201E+02	1.76 %
I-129	5.626E-01	0.00 %
I-131	1.056E-02	0.00 %
MN-54	2.268E+03	9.48 %
NB-95	2.882E+01	0.12 %
NI-59	4.346E-01	0.00 %
NI-63	3.647E+01	0.15 %
PU-241	4.140E-02	0.00 %
SB-124	1.107E+00	0.00 %
SR-90	1.198E-01	0.00 %
TC-99	1.498E-02	0.00 %
ZN-65	6.172E+00	0.03 %
ZR-95	3.150E+01	0.13 %
Total Activity (Ci)	23.917	100.00 %
Container Volume	205.670 ft3	5.824 m3

TABLE 2-14

Annual Waste Release Summary Report

Year: 2002
Class: A Volume Reduction Vendor: Yes
Source: Contaminated Waste Oil
Container: None
Process: Fuel Blending for Co-Generation

Nuclides	Activity (mCi)	% of Total
AM-241	5.670E-09	0.00 %
C-14	1.680E-07	0.01 %
CE-144	3.470E-07	0.01 %
CM-242	6.640E-09	0.00 %
CM-244	4.660E-09	0.00 %
CO-60	4.360E-04	14.72 %
CS-137	7.630E-08	0.00 %
FE-55	1.980E-03	66.84 %
H-3	4.300E-04	14.52 %
I-129	< 8.210E-12	0.00 %
MN-54	1.100E-04	3.71 %
NI-63	4.150E-06	0.14 %
PU-238	1.290E-08	0.00 %
PU-239	7.800E-09	0.00 %
PU-241	1.560E-06	0.05 %
SR-90	5.880E-08	0.00 %
TC-99	< 4.050E-13	0.00 %
Total Activity (Ci)	0.000	100.00 %
Container Volume	0.000 ft3	0.000 m3

TABLE 2-15

Annual Waste Release Summary Report

Year: 2002
Class: A Volume Reduction Vendor: Yes
Source: Liquid Radwaste Filter Media
Container: HIC (High Integrity Container)
Process: Pyrolysis

Nuclides	Activity (mCi)	% of Total
C-14	1.580E-04	0.00 %
CE-144	7.500E-05	0.00 %
CO-58	5.670E-03	0.04 %
CO-60	7.450E-01	4.88 %
CR-51	9.470E-05	0.00 %
CS-137	1.710E-04	0.00 %
FE-55	1.240E+01	81.27 %
FE-59	3.450E-03	0.02 %
H-3	7.860E-04	0.01 %
MN-54	2.080E+00	13.63 %
NB-95	1.130E-05	0.00 %
NI-63	1.510E-02	0.10 %
SB-124	5.600E-04	0.00 %
SR-90	1.580E-05	0.00 %
ZN-65	7.360E-03	0.05 %
ZR-95	1.510E-04	0.00 %
Total Activity (Ci)	0.015	100.00 %
Container Volume	5.980 ft3	0.169 m3

TABLE 2-16

Annual Waste Release Summary Report

Year: 2002
Class: A Volume Reduction Vendor: Yes
Source: Phosphoric Acid
Container: Drums
Process: Incineration

Nuclides	Activity (mCi)	% of Total
AG-110M	1.700E-02	2.34 %
AM-241	1.620E-06	0.00 %
CE-144	5.830E-05	0.01 %
CM-242	1.830E-06	0.00 %
CM-244	1.170E-06	0.00 %
CO-58	3.490E-03	0.48 %
CO-60	1.940E-01	26.68 %
CR-51	1.220E-02	1.68 %
CS-137	9.360E-05	0.01 %
FE-55	7.450E-02	10.25 %
FE-59	1.760E-02	2.42 %
H-3	1.210E-01	16.64 %
MN-54	2.720E-01	37.41 %
NI-59	8.630E-04	0.12 %
NI-63	3.980E-03	0.55 %
PU-238	1.980E-06	0.00 %
PU-239	2.000E-06	0.00 %
PU-241	5.710E-04	0.08 %
SR-90	4.540E-05	0.01 %
TC-99	1.500E-04	0.02 %
ZN-65	9.540E-03	1.31 %
Total Activity (Ci)	0.001	100.00 %
Container Volume	15.450 ft3	0.438 m3

TABLE 2-17

Annual Waste Release Summary Report

Year: 2002
Class: A
Volume Reduction Vendor: Yes
Source: Processed DAW
Container: Strong Tight Container
Process: Compacted

Nuclides	Activity (mCi)	% of Total
AG-110M	2.127E+00	0.05 %
AM-241	2.299E-03	0.00 %
C-14	1.816E-01	0.00 %
CE-144	3.772E+00	0.09 %
CM-242	2.286E-03	0.00 %
CM-244	1.809E-03	0.00 %
CO-58	1.026E+01	0.25 %
CO-60	5.178E+02	12.72 %
CR-51	7.261E+00	0.18 %
CS-137	2.742E+00	0.07 %
FE-55	2.648E+03	65.06 %
FE-59	5.237E+01	1.29 %
H-3	4.216E+00	0.10 %
I-129	6.260E-02	0.00 %
MN-54	8.013E+02	19.69 %
NB-95	2.453E-01	0.01 %
NI-59	7.105E-01	0.02 %
NI-63	9.541E+00	0.23 %
PU-238	5.672E-03	0.00 %
PU-239	3.336E-03	0.00 %
PU-241	6.848E-01	0.02 %
SB-124	1.432E-01	0.00 %
SB-125	1.236E+00	0.03 %
SR-89	2.864E-02	0.00 %
SR-90	2.423E-02	0.00 %
TC-99	< 1.360E-05	0.00 %
ZN-65	7.111E+00	0.17 %
ZR-95	1.235E-01	0.00 %
Total Activity (Ci)	4.070	100.00 %
Container Volume	1538.130 ft3	43.556 m3

TABLE 2-18

Annual Waste Release Summary Report

Year: 2002
Class: B Volume Reduction Vendor: No
Source: RWCU Filter Media
Container: HIC (High Integrity Container)
Process: Dewatered

Nuclides	Activity (mCi)	% of Total
C-14	2.220E+02	0.01 %
CE-144	2.690E+02	0.02 %
CM-242	3.090E-02	0.00 %
CO-58	3.020E+03	0.18 %
CO-60	2.390E+05	14.49 %
CR-51	2.850E+03	0.17 %
CS-137	3.810E+02	0.02 %
FE-55	1.180E+06	71.54 %
FE-59	2.060E+03	0.12 %
H-3	1.380E+03	0.08 %
I-129	< 1.080E-04	0.00 %
MN-54	1.870E+05	11.34 %
NB-95	9.600E+03	0.58 %
NI-59	2.530E+01	0.00 %
NI-63	3.840E+03	0.23 %
PU-238	1.300E-02	0.00 %
PU-239	4.490E-03	0.00 %
PU-241	1.040E+00	0.00 %
SB-124	1.020E+02	0.01 %
SB-125	8.190E+03	0.50 %
SR-89	8.450E+01	0.01 %
TC-99	7.000E+01	0.00 %
ZN-65	2.470E+03	0.15 %
ZR-95	8.890E+03	0.54 %
Total Activity (Ci)	1649.455	100.00 %
Container Volume	132.000 ft3	3.738 m3

TABLE 2-19

Annual Waste Release Summary Report

Year: 2002
Class: B Volume Reduction Vendor: Yes
Source: Condensate Demineralizer / Radwaste Demineralizer
Container: HIC (High Integrity Container)
Process: Pyrolysis

Nuclides	Activity (mCi)	% of Total
C-14	1.843E+00	0.00 %
CO-57	7.150E+01	0.06 %
CO-58	9.600E+03	8.01 %
CO-60	7.750E+04	64.67 %
CR-51	5.673E+03	4.73 %
CS-137	6.244E+01	0.05 %
FE-55	1.874E+04	15.64 %
FE-59	7.140E+01	0.06 %
H-3	7.880E+00	0.01 %
I-129	5.583E-01	0.00 %
MN-54	5.180E+03	4.32 %
NI-59	9.460E-01	0.00 %
NI-63	2.791E+02	0.23 %
SR-89	1.400E+01	0.01 %
SR-90	3.840E+00	0.00 %
TC-99	4.304E-01	0.00 %
ZN-65	2.630E+03	2.19 %
Total Activity (Ci)	119.837	100.00 %
Container Volume	22.000 ft3	0.623 m3

TABLE 2-20

Annual Waste Release Summary Report

Year: 2002
Class: B Volume Reduction Vendor: Yes
Source: Liquid Radwaste Filter Media
Container: HIC (High Integrity Container)
Process: Pyrolysis

Nuclides	Activity (mCi)	% of Total
C-14	4.726E+00	0.00 %
CE-144	4.119E+00	0.00 %
CO-58	1.611E+03	0.29 %
CO-60	2.438E+04	4.33 %
CR-51	2.246E+04	3.99 %
CS-137	5.219E+00	0.00 %
FE-55	4.408E+05	78.30 %
FE-59	2.876E+03	0.51 %
H-3	2.644E+01	0.00 %
HF-181	2.407E+01	0.00 %
I-129	3.805E-01	0.00 %
MN-54	6.982E+04	12.40 %
NB-95	7.417E+01	0.01 %
NI-63	4.537E+02	0.08 %
SB-124	1.309E+02	0.02 %
SR-90	4.833E-01	0.00 %
TC-99	1.254E-02	0.00 %
ZN-65	2.647E+02	0.05 %
ZR-95	4.060E-01	0.00 %
Total Activity (Ci)	562.931	100.00 %
Container Volume	18.400 ft3	0.521 m3

TABLE 2-21

Annual Waste Release Summary Report

Year: 2002
Class: C Volume Reduction Vendor: No
Source: Cartridge Filters
Container: HIC (High Integrity Container)
Process: Non-Processed

Nuclides	Activity (mCi)	% of Total
AG-110M	1.540E+00	0.01 %
C-14	5.890E-01	0.00 %
CE-144	1.071E+01	0.06 %
CM-242	5.070E-03	0.00 %
CM-244	5.770E-05	0.00 %
CO-57	4.540E+00	0.03 %
CO-58	7.220E+02	4.36 %
CO-60	1.048E+04	63.32 %
CR-51	3.240E+02	1.96 %
CS-134	8.920E-02	0.00 %
CS-137	1.673E+01	0.10 %
FE-55	3.460E+03	20.90 %
FE-59	6.890E+00	0.04 %
H-3	1.407E+00	0.01 %
I-129	7.210E-01	0.00 %
MN-54	8.267E+02	4.99 %
NB-95	4.592E-03	0.00 %
NI-59	1.060E+00	0.01 %
NI-63	5.463E+01	0.33 %
PU-238	1.160E-04	0.00 %
PU-239	3.980E-05	0.00 %
PU-241	1.172E+01	0.07 %
SB-125	7.050E-01	0.00 %
SR-89	4.860E-02	0.00 %
SR-90	2.050E-02	0.00 %
TC-99	1.340E+01	0.08 %
ZN-65	6.143E+02	3.71 %
Total Activity (Ci)	16.555	100.00 %
Container Volume	41.980 ft3	1.189 m3

TABLE 2-22

Annual Waste Release Summary Report

Year: 2002
Class: C Volume Reduction Vendor: No
Source: Non-Processed DAW
Container: HIC (High Integrity Container)
Process: Non-Processed

Nuclides	Activity (mCi)	% of Total
C-14	8.300E-02	0.00 %
CE-144	1.610E+00	0.03 %
CM-242	5.320E-02	0.00 %
CO-58	4.630E+00	0.09 %
CO-60	3.430E+03	63.39 %
CS-137	8.830E+00	0.16 %
FE-55	1.360E+03	25.13 %
FE-59	7.890E-02	0.00 %
H-3	3.780E+00	0.07 %
I-129	4.630E-02	0.00 %
MN-54	4.730E+02	8.74 %
NB-95	4.250E+00	0.08 %
NI-59	3.450E-01	0.01 %
NI-63	5.830E+01	1.08 %
PU-241	3.680E+01	0.68 %
SB-125	7.130E-01	0.01 %
SR-89	1.210E-04	0.00 %
SR-90	1.750E-02	0.00 %
TC-99	< 1.440E-01	0.00 %
ZN-65	2.820E+01	0.52 %
Total Activity (Ci)	5.411	100.00 %
Container Volume	90.430 ft3	2.561 m3

TABLE 2-23

Annual Waste Release Summary Report

Year: 2002
Class: C Volume Reduction Vendor: Yes
Source: Liquid Radwaste Filter Media
Container: HIC (High Integrity Container)
Process: Pyrolysis

Nuclides	Activity (mCi)	% of Total
C-14	6.640E+00	0.00 %
CE-144	6.120E+00	0.00 %
CO-58	3.214E+03	0.38 %
CO-60	3.455E+04	4.10 %
CR-51	1.203E+04	1.43 %
CS-137	7.350E+00	0.00 %
FE-55	6.330E+05	75.19 %
FE-59	8.640E+03	1.03 %
H-3	3.511E+01	0.00 %
HF-181	8.960E+00	0.00 %
I-129	4.870E-01	0.00 %
MN-54	1.485E+05	17.64 %
NB-95	1.060E+02	0.01 %
NI-63	6.380E+02	0.08 %
SB-124	4.641E+02	0.06 %
SR-90	6.820E-01	0.00 %
TC-99	1.607E-02	0.00 %
ZN-65	6.129E+02	0.07 %
ZR-95	9.380E+01	0.01 %
Total Activity (Ci)	841.914	100.00 %
Container Volume	22.820 ft3	0.646 m3

SECTION 3

METEOROLOGICAL DATA AND DISPERSION ESTIMATES

METEOROLOGY AND DISPERSION DATA

Meteorological data have been collected at the Susquehanna SES (SSES) site since the early 1970s. At the present time, the meteorological system is based on a 300-foot high tower located approximately 1,000 feet to the southeast of the plant. Wind sensors are mounted at the 10m and 60m elevations on this tower. Vertical temperature differential is measured with redundant sensor pairs between the 10m and 60m levels. Sigma theta (the standard deviation of horizontal wind direction) is calculated from wind direction at both levels. Dew point and ambient temperature sensors are present at the 10m level. Precipitation is measured at ground level.

A back-up meteorological tower was erected in 1982. It is a 10m tower providing alternate measurements of wind speed, wind direction, and sigma theta. A 10m supplemental downriver meteorological tower is also available. This tower measures wind speed, wind direction, sigma theta, temperature and dew point.

SSES meteorological data are transmitted to the plant Control Room, Technical Support Center, Emergency Operations Facility for emergency response availability, and ABSG Consulting, Inc. ABSG Consulting, Inc., located in Rockville, Maryland, provides meteorological consulting services to PPL Susquehanna, LLC.

Dispersion modeling for effluents from normal operation of SSES is done using the MIDAS system XDCALC program, a straight-line Gaussian plume model designed to estimate average relative concentration. The model was developed in accordance with Regulatory Guide 1.111. For periods when the wind speed is calm, the actual wind direction that occurred is used.

XDCALC and the XQINTR program that interpolates X/Q values to exact locations both use terrain correction factors to account for the temporal and spatial variations in the airflow in the region. A straight-line trajectory model assumes that a constant mean wind transports and diffuses effluents in the direction of airflow at the release point within the entire region of interest. The SSES terrain correction factors were taken from SSES FSAR Table 2.3-128.

TABLE 3-1

SSES METEOROLOGICAL DATA RECOVERY FOR 2002

PARAMETER	PERCENT VALID DATA RECOVERY
Wind Speed 10m – Primary [1]	99.5
Wind Speed 60m – Primary	99.5
Wind Speed 10m – Backup[2]	99.9
Wind Speed 10m – Downriver[3]	99.9
Wind Direction 10m – Primary	99.4
Wind Direction 60m – Primary	99.5
Wind Direction 10m – Backup	99.9
Wind Direction 10m – Downriver	100.0
Temperature 10m – Primary	99.6
Dew Point 10m – Primary	98.6
Delta Temperature 60m – Primary	99.0
Sigma Theta 10m – Primary	99.4
Sigma Theta 60m – Primary	99.5
Sigma Theta 10m- Backup	99.9
Sigma Theta 10m - Downriver	100.0
Precipitation – Primary	100.0
Composite Parameters	
Wind Speed and Direction 10m, Delta Temperature 60-10m	99.0
Wind Speed and Direction 60m, Delta Temperature 60-10m	99.0

[1]SSES "Primary" meteorological tower
[2]SSES "Backup" meteorological tower
[3]SSES "Downriver" meteorological tower

TABLE 3-2

Table 2. SSES Joint Frequency Distribution of Wind Speed and Direction 10m Versus Delta Temperature 60-10m for the Period of January 1, 2002 through December 31, 2002

SITE: SSES

HOURS AT EACH WIND SPEED AND DIRECTION
PERIOD OF RECORD = 02010101-02123124
STABILITY CLASS: A DT/DZ
ELEVATION: SPEED:10M SP DIRECTION:10M WD LAPSE:DT A

	WIND SPEED(MPH)						
WIND DIRECTION	1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	0	3	12	2	0	0	17
NNE	1	2	11	1	0	0	15
NE	2	9	0	0	0	0	11
ENE	1	3	0	0	0	0	4
E	2	2	0	0	0	0	4
ESE	0	2	2	0	0	0	4
SE	1	1	4	0	0	0	6
SSE	1	4	5	0	0	0	10
S	2	10	11	0	0	0	23
SSW	3	26	26	0	0	0	55
SW	2	40	46	6	0	0	94
WSW	0	6	21	2	0	0	29
W	0	0	1	0	0	0	1
WNW	1	0	0	0	0	0	1
NW	0	0	1	0	0	0	1
NNW	0	0	3	0	0	0	3
TOTAL	16	108	143	11	0	0	278

PERIODS OF CALM(HOURS): 13
VARIABLE DIRECTION 0
HOURS OF MISSING DATA: 85

TABLE 3-2
(continued)

Table 2 (continued)

SITE: SSES

HOURS AT EACH WIND SPEED AND DIRECTION
PERIOD OF RECORD = 02010101-02123124
STABILITY CLASS: B DT/DZ
ELEVATION: SPEED:10M SP DIRECTION:10M WD LAPSE:DT A

	WIND SPEED(MPH)						
WIND DIRECTION	1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	0	8	13	1	0	0	22
NNE	2	15	6	0	0	0	23
NE	3	10	0	0	0	0	13
ENE	4	2	0	0	0	0	6
E	4	3	0	0	0	0	7
ESE	2	1	1	0	0	0	4
SE	2	4	0	0	0	0	6
SSE	1	2	0	0	0	0	3
S	3	6	7	0	0	0	16
SSW	3	27	10	1	0	0	41
SW	2	43	67	8	1	0	121
WSW	0	10	27	5	0	0	42
W	0	1	5	0	0	0	6
WNW	0	0	0	0	0	0	0
NW	0	0	1	0	0	0	1
NNW	0	2	7	2	0	0	11
TOTAL	26	134	144	17	1	0	322

PERIODS OF CALM(HOURS): 13
VARIABLE DIRECTION 0
HOURS OF MISSING DATA: 85

TABLE 3-2
(continued)

Table 2 (continued)

SITE: SSES

HOURS AT EACH WIND SPEED AND DIRECTION
PERIOD OF RECORD = 02010101-02123124
STABILITY CLASS: C DT/DZ
ELEVATION: SPEED:10M SP DIRECTION:10M WD LAPSE:DT A

	WIND SPEED(MPH)						
WIND DIRECTION	1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	0	10	17	0	0	0	27
NNE	1	25	9	0	0	0	35
NE	2	16	1	0	0	0	19
ENE	6	5	0	0	0	0	11
E	7	3	0	0	0	0	10
ESE	7	5	0	0	0	0	12
SE	3	7	0	0	0	0	10
SSE	4	8	2	0	0	0	14
S	7	12	8	0	0	0	27
SSW	0	27	5	0	0	0	32
SW	2	72	47	6	0	0	127
WSW	1	12	32	12	1	0	58
W	2	4	5	3	0	0	14
WNW	0	1	3	0	0	0	4
NW	0	2	4	2	0	0	8
NNW	0	5	11	4	0	0	20
TOTAL	42	214	144	27	1	0	428

PERIODS OF CALM(HOURS): 13
VARIABLE DIRECTION 0
HOURS OF MISSING DATA: 85

TABLE 3-2
(continued)

Table 2 (continued)

SITE: SSES

HOURS AT EACH WIND SPEED AND DIRECTION
PERIOD OF RECORD = 02010101-02123124
STABILITY CLASS: D DT/DZ
ELEVATION: SPEED:10M SP DIRECTION:10M WD LAPSE:DT.A

	WIND SPEED(MPH)						
WIND DIRECTION	1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	16	138	85	1	0	0	240
NNE	63	177	26	0	0	0	266
NE	73	143	8	0	0	0	224
ENE	70	51	1	0	0	0	124
E	82	36	2	0	0	0	121
ESE	73	60	9	1	0	0	143
SE	78	86	11	0	0	0	175
SSE	52	98	22	0	0	0	172
S	60	99	38	1	0	0	198
SSW	57	151	33	0	0	0	241
SW	42	209	162	8	0	0	421
WSW	25	101	165	51	0	0	342
W	10	75	94	33	5	0	217
WNW	5	50	69	27	0	0	151
NW	8	62	124	20	0	0	214
NNW	14	82	136	30	0	0	262
TOTAL	728	1618	985	172	5	0	3511

PERIODS OF CALM(HOURS): 13
VARIABLE DIRECTION 0
HOURS OF MISSING DATA: 85

TABLE 3-2
(continued)

Table 2 (continued)

SITE: SSES

HOURS AT EACH WIND SPEED AND DIRECTION
PERIOD OF RECORD = 02010101-02123124
STABILITY CLASS: E DT/DZ
ELEVATION: SPEED:10M SP DIRECTION:10M WD LAPSE:DT A

	WIND SPEED(MPH)						
WIND DIRECTION	1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	38	71	5	0	0	0	114
NNE	94	127	12	0	0	0	233
NE	175	58	4	0	0	0	239
ENE	186	3	1	0	0	0	192
E	171	7	0	0	0	0	180
ESE	111	4	0	0	0	0	116
SE	99	9	0	1	0	0	109
SSE	94	35	2	0	0	0	131
S	158	80	18	3	0	0	259
SSW	119	163	25	0	0	0	308
SW	44	149	21	0	1	0	215
WSW	19	39	13	0	0	0	71
W	13	15	4	0	0	0	32
WNW	8	11	0	0	0	0	19
NW	7	14	10	0	0	0	31
NNW	7	28	9	0	0	0	44
TOTAL	1343	813	124	4	1	0	2293

PERIODS OF CALM(HOURS): 13
VARIABLE DIRECTION 0
HOURS OF MISSING DATA: 85

TABLE 3-2
(continued)

Table 2 (continued)

SITE: SSES

HOURS AT EACH WIND SPEED AND DIRECTION
PERIOD OF RECORD = 02010101-02123124
STABILITY CLASS: F DT/DZ
ELEVATION: SPEED:10M SP DIRECTION:10M WD LAPSE:DT A

WIND DIRECTION	WIND SPEED(MPH) 1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	7	5	0	0	0	0	12
NNE	33	6	0	0	0	0	39
NE	114	5	0	0	0	0	119
ENE	471	7	0	0	0	0	479
E	194	0	0	0	0	0	195
ESE	83	0	0	0	0	0	83
SE	44	0	0	0	0	0	44
SSE	56	3	0	0	0	0	59
S	56	5	0	0	0	0	61
SSW	27	6	0	0	0	0	33
SW	9	7	0	0	0	0	16
WSW	2	0	0	0	0	0	2
W	1	1	0	0	0	0	2
WNW	2	0	0	0	0	0	2
NW	1	1	0	0	0	0	2
NNW	2	2	0	0	0	0	4
TOTAL	1102	48	0	0	0	0	1152

PERIODS OF CALM(HOURS): 13
VARIABLE DIRECTION 0
HOURS OF MISSING DATA: 85

TABLE 3-2
(continued)

Table 2 (continued)

SITE: SSES

HOURS AT EACH WIND SPEED AND DIRECTION
PERIOD OF RECORD = 02010101-02123124
STABILITY CLASS: G DT/DZ
ELEVATION: SPEED:10M SP DIRECTION:10M WD LAPSE:DT A

	WIND SPEED(MPH)						
WIND DIRECTION	1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	1	0	0	0	0	0	1
NNE	13	1	0	0	0	0	14
NE	88	4	0	0	0	0	92
ENE	425	13	0	0	0	0	438
E	69	0	0	0	0	0	69
ESE	29	0	0	0	0	0	29
SE	18	0	0	0	0	0	18
SSE	13	0	0	0	0	0	13
S	4	0	0	0	0	0	4
SSW	7	3	0	0	0	0	10
SW	1	0	0	0	0	0	1
WSW	1	0	0	0	0	0	1
W	0	0	0	0	0	0	0
WNW	0	0	0	0	0	0	0
NW	0	0	0	0	0	0	0
NNW	1	0	0	0	0	0	1
TOTAL	670	21	0	0	0	0	691

PERIODS OF CALM(HOURS): 13
VARIABLE DIRECTION 0
HOURS OF MISSING DATA: 85

TABLE 3-2
(continued)

Table 2 (continued)

SITE: SSES

HOURS AT EACH WIND SPEED AND DIRECTION
PERIOD OF RECORD = 02010101-02123124
STABILITY CLASS: ALL DT/DZ
ELEVATION: SPEED:10M SP DIRECTION:10M WD LAPSE:DT A

WIND DIRECTION	WIND SPEED(MPH) 1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	62	235	132	4	0	0	433
NNE	207	353	64	1	0	0	625
NE	457	245	13	0	0	0	717
ENE	1163	84	2	0	0	0	1254
E	529	51	2	0	0	0	586
ESE	305	72	12	1	0	0	391
SE	245	107	15	1	0	0	368
SSE	221	150	31	0	0	0	402
S	290	212	82	4	0	0	588
SSW	216	403	99	1	0	0	720
SW	102	520	343	28	2	0	995
WSW	48	168	258	70	1	0	545
W	26	96	109	36	5	0	272
WNW	16	62	72	27	0	0	177
NW	16	79	140	22	0	0	257
NNW	24	119	166	36	0	0	345
TOTAL	3927	2956	1540	231	8	0	8675

PERIODS OF CALM(HOURS): 13
VARIABLE DIRECTION 0
HOURS OF MISSING DATA: 85

TABLE 3-3

Table 3. SSES Joint Frequency Distribution of Wind Speed
and Direction 60m Versus Delta Temperature 60-10m
for the Period of
January 1, 2002 through December 31, 2002

SITE: SSES

HOURS AT EACH WIND SPEED AND DIRECTION
PERIOD OF RECORD = 02010101-02123124
STABILITY CLASS: A DT/DZ
ELEVATION: SPEED:60M SP DIRECTION:60M WD LAPSE:DT A

WIND DIRECTION	WIND SPEED(MPH) 1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	0	1	15	3	0	0	19
NNE	0	3	6	6	0	0	15
NE	4	7	2	0	0	0	13
ENE	1	3	0	0	0	0	4
E	0	1	0	0	0	0	1
ESE	1	1	0	3	0	0	5
SE	2	1	0	4	0	0	7
SSE	0	0	1	1	0	0	2
S	0	5	3	10	0	0	18
SSW	1	13	23	8	3	0	48
SW	1	14	55	30	1	1	102
WSW	0	3	15	20	0	0	38
W	0	0	1	1	0	0	2
WNW	0	1	0	0	0	0	1
NW	0	0	0	1	0	0	1
NNW	0	0	1	1	0	0	2
TOTAL	10	53	122	88	4	1	278

PERIODS OF CALM(HOURS): 0
VARIABLE DIRECTION 0
HOURS OF MISSING DATA: 85

TABLE 3-3
(continued)

Table 3 (continued)

SITE: SSES

HOURS AT EACH WIND SPEED AND DIRECTION
PERIOD OF RECORD = 02010101-02123124
STABILITY CLASS: B DT/DZ
ELEVATION: SPEED:60M SP DIRECTION:60M WD LAPSE:DT A

WIND DIRECTION	WIND SPEED(MPH) 1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	1	3	14	6	0	0	24
NNE	2	12	10	2	0	0	26
NE	3	7	4	0	0	0	14
ENE	2	3	1	0	0	0	6
E	3	0	1	0	0	0	4
ESE	2	2	0	1	0	0	5
SE	0	2	0	0	0	0	2
SSE	0	0	1	0	0	0	1
S	1	2	5	3	0	0	11
SSW	2	9	12	6	4	0	33
SW	0	21	63	27	2	4	117
WSW	0	3	27	28	2	0	60
W	0	0	8	0	0	0	8
WNW	0	0	0	0	0	0	0
NW	0	2	2	0	1	0	5
NNW	0	0	4	1	1	0	6
TOTAL	16	66	152	74	10	4	322

PERIODS OF CALM(HOURS): 0
VARIABLE DIRECTION 0
HOURS OF MISSING DATA: 85

TABLE 3-3
(continued)

Table 3 (continued)

SITE: SSES

HOURS AT EACH WIND SPEED AND DIRECTION
PERIOD OF RECORD = 02010101-02123124
STABILITY CLASS: C DT/DZ
ELEVATION: SPEED:60M SP DIRECTION:60M WD LAPSE:DT A

WIND DIRECTION	WIND SPEED(MPH) 1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	1	4	21	1	0	0	27
NNE	1	15	17	6	0	0	39
NE	5	15	1	1	0	0	22
ENE	5	7	0	0	0	0	12
E	4	2	0	0	0	0	6
ESE	1	6	0	0	0	0	7
SE	3	3	4	0	0	0	10
SSE	0	1	0	1	0	0	2
S	4	10	11	7	0	0	32
SSW	2	9	13	5	2	0	31
SW	2	31	54	19	3	0	109
WSW	0	7	37	30	10	1	85
W	1	1	3	7	1	0	13
WNW	2	0	4	0	0	0	6
NW	0	2	4	5	0	0	11
NNW	0	4	7	3	2	0	16
TOTAL	31	117	176	85	18	1	428

PERIODS OF CALM(HOURS): 0
VARIABLE DIRECTION 0
HOURS OF MISSING DATA: 85

TABLE 3-3
(continued)

Table 3 (continued)

SITE: SSES

HOURS AT EACH WIND SPEED AND DIRECTION
PERIOD OF RECORD = 02010101-02123124
STABILITY CLASS: D DT/DZ
ELEVATION: SPEED:60M SP DIRECTION:60M WD LAPSE:DT A

	WIND SPEED(MPH)						
WIND DIRECTION	1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	8	44	127	18	0	0	197
NNE	25	90	140	27	0	0	282
NE	48	82	91	10	0	0	231
ENE	43	46	15	0	0	0	104
E	29	63	14	3	0	0	109
ESE	25	42	22	7	2	0	98
SE	27	61	37	10	0	0	135
SSE	34	46	66	14	1	0	161
S	29	44	60	35	5	0	173
SSW	24	80	70	42	4	0	220
SW	26	127	148	68	6	0	375
WSW	11	71	184	214	43	2	525
W	2	31	107	116	29	7	292
WNW	4	13	79	49	11	0	156
NW	3	17	115	72	3	0	210
NNW	8	36	137	60	2	0	243
TOTAL	346	893	1412	745	106	9	3511

PERIODS OF CALM(HOURS): 0
VARIABLE DIRECTION 0
HOURS OF MISSING DATA: 85

TABLE 3-3
(continued)

Table 3 (continued)

SITE: SSES

HOURS AT EACH WIND SPEED AND DIRECTION
PERIOD OF RECORD = 02010101-02123124
STABILITY CLASS: E DT/DZ
ELEVATION: SPEED:60M SP DIRECTION:60M WD LAPSE:DT A

WIND DIRECTION	WIND SPEED(MPH) 1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	17	84	33	2	0	0	136
NNE	60	148	69	18	0	0	295
NE	102	89	51	7	0	0	249
ENE	63	34	4	1	0	0	102
E	37	22	9	0	0	0	68
ESE	38	16	3	0	0	0	57
SE	39	15	8	2	1	0	65
SSE	38	33	20	3	0	0	94
S	54	59	54	19	7	3	196
SSW	37	87	104	43	5	0	276
SW	35	104	121	27	0	1	288
WSW	14	64	128	56	1	0	263
W	10	29	13	5	1	0	58
WNW	2	19	7	0	0	0	28
NW	4	12	22	11	0	0	49
NNW	10	27	30	2	0	0	69
TOTAL	560	842	676	196	15	4	2293

PERIODS OF CALM(HOURS): 0
VARIABLE DIRECTION 0
HOURS OF MISSING DATA: 85

TABLE 3-3
(continued)

Table 3 (continued)

SITE: SSES

HOURS AT EACH WIND SPEED AND DIRECTION
PERIOD OF RECORD = 02010101-02123124
STABILITY CLASS: F DT/DZ
ELEVATION: SPEED:60M SP DIRECTION:60M WD LAPSE:DT A

WIND DIRECTION	WIND SPEED(MPH) 1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	18	69	5	0	0	0	92
NNE	84	226	6	0	0	0	316
NE	115	52	1	0	0	0	168
ENE	51	5	0	0	0	0	56
E	32	5	0	0	0	0	37
ESE	36	6	0	0	0	0	42
SE	34	5	1	0	0	0	40
SSE	32	7	0	0	0	0	39
S	42	34	6	1	0	0	83
SSW	21	50	10	0	0	0	81
SW	10	52	27	0	0	0	89
WSW	8	11	50	5	0	0	74
W	2	4	0	0	0	0	6
WNW	1	4	0	0	0	0	5
NW	2	6	2	0	0	0	10
NNW	3	8	3	0	0	0	14
TOTAL	491	544	111	6	0	0	1152

PERIODS OF CALM(HOURS): 0
VARIABLE DIRECTION 0
HOURS OF MISSING DATA: 85

TABLE 3-3
(continued)

Table 3 (continued)

SITE: SSES

HOURS AT EACH WIND SPEED AND DIRECTION
PERIOD OF RECORD = 02010101-02123124
STABILITY CLASS: G DT/DZ
ELEVATION: SPEED:60M SP DIRECTION:60M WD LAPSE:DT A

	WIND SPEED(MPH)						
WIND DIRECTION	1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	6	44	4	0	0	0	54
NNE	55	141	0	0	0	0	196
NE	78	36	1	0	0	0	115
ENE	36	13	0	0	0	0	49
E	28	4	0	0	0	0	32
ESE	21	5	0	0	0	0	26
SE	25	1	1	0	0	0	27
SSE	20	5	0	0	0	0	25
S	15	26	2	0	0	0	43
SSW	6	38	3	0	0	0	47
SW	7	24	6	1	0	0	38
WSW	2	6	13	6	0	0	27
W	0	1	0	0	0	0	1
WNW	1	1	0	0	0	0	2
NW	1	2	3	0	0	0	6
NNW	0	3	0	0	0	0	3
TOTAL	301	350	33	7	0	0	691

PERIODS OF CALM(HOURS): 0
VARIABLE DIRECTION 0
HOURS OF MISSING DATA: 85

TABLE 3-3
(continued)

Table 3 (continued)

SITE: SSES

HOURS AT EACH WIND SPEED AND DIRECTION
PERIOD OF RECORD = 02010101-02123124
STABILITY CLASS: ALL DT/DZ
ELEVATION: SPEED:60M SP DIRECTION:60M WD LAPSE:DT A

WIND DIRECTION	WIND SPEED(MPH) 1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	51	249	219	30	0	0	549
NNE	227	635	248	59	0	0	1169
NE	355	288	151	18	0	0	812
ENE	201	111	20	1	0	0	333
E	133	97	24	3	0	0	257
ESE	124	78	25	11	2	0	240
SE	130	88	51	16	1	0	286
SSE	124	92	88	19	1	0	324
S	145	180	141	75	12	3	556
SSW	93	286	235	104	18	0	736
SW	81	373	474	172	12	6	1118
WSW	35	165	454	359	56	3	1072
W	15	66	132	129	31	7	380
WNW	10	38	90	49	11	0	198
NW	10	41	148	89	4	0	292
NNW	21	78	182	67	5	0	353
TOTAL	1755	2865	2682	1201	153	19	8675

PERIODS OF CALM(HOURS): 0
VARIABLE DIRECTION 0
HOURS OF MISSING DATA: 85

TABLE 3-4

2002 SSES ANNUAL RELATIVE CONCENTRATIONS NO DECAY, UNDEPLETED X/Q (sec/m^3)

DATES OF LAST X/Q ACCUMULATION ARE FROM 2 1 1 1 0 TO 2123124 0
X/Q ACCUMULATION FOR GROUND AVERAGE SEC/M3
FOR RELEASE POINT 1

	MILES								
0.5-1	1-2	2-3	3-4	4-5	5-10	10-20	20-30	30-40	40-50
**DIRECTION FROM N									
3.9379E-06	7.6082E-07	3.1798E-07	1.6784E-07	1.0808E-07	4.0255E-08	1.1095E-08	5.3949E-09	3.4030E-09	2.4127E-09
**DIRECTION FROM NNE									
8.4537E-06	1.6986E-06	7.6559E-07	4.1443E-07	2.6897E-07	1.0065E-07	2.7988E-08	1.3854E-08	8.8342E-09	6.3454E-09
**DIRECTION FROM NE									
1.5953E-05	2.9766E-06	1.3543E-06	7.7327E-07	5.1429E-07	2.0460E-07	6.2481E-08	3.1536E-08	2.0317E-08	1.4810E-08
**DIRECTION FROM ENE									
5.0106E-05	9.0704E-06	4.4188E-06	2.6459E-06	1.7763E-06	7.0835E-07	2.0817E-07	1.0163E-07	6.6014E-08	4.8625E-08
**DIRECTION FROM E									
2.0427E-05	3.7301E-06	1.6598E-06	9.4409E-07	6.3202E-07	2.5725E-07	8.1744E-08	4.1578E-08	2.6941E-08	1.9662E-08
**DIRECTION FROM ESE									
1.3100E-05	2.5055E-06	1.1464E-06	6.4959E-07	4.3301E-07	1.7568E-07	4.9303E-08	2.1806E-08	1.4056E-08	1.0209E-08
**DIRECTION FROM SE									
1.0910E-05	2.1229E-06	9.7689E-07	5.5702E-07	3.7062E-07	1.5162E-07	3.8241E-08	1.4184E-08	9.0846E-09	6.5577E-09
**DIRECTION FROM SSE									
9.6156E-06	1.8520E-06	8.3697E-07	4.7779E-07	3.2270E-07	1.3976E-07	3.7189E-08	1.3424E-08	8.6133E-09	6.2179E-09
**DIRECTION FROM S									
7.8065E-06	1.6745E-06	8.2542E-07	4.8206E-07	3.3147E-07	1.5446E-07	4.3137E-08	1.4937E-08	9.5594E-09	6.8711E-09
**DIRECTION FROM SSW									
8.7781E-06	1.7834E-06	8.2504E-07	4.6985E-07	3.1292E-07	1.3103E-07	3.4478E-08	1.3187E-08	8.3986E-09	6.0193E-09
**DIRECTION FROM SW									
6.3793E-06	1.2807E-06	6.0772E-07	3.4847E-07	2.3390E-07	1.0287E-07	2.6641E-08	8.9831E-09	5.6881E-09	4.0439E-09
**DIRECTION FROM WSW									
3.5508E-06	6.8882E-07	3.2088E-07	1.8911E-07	1.2965E-07	6.1466E-08	1.9317E-08	7.2503E-09	3.7117E-09	2.0332E-09
**DIRECTION FROM W									
1.6539E-06	3.1928E-07	1.3771E-07	7.5264E-08	4.9263E-08	2.0085E-08	5.3873E-09	2.1671E-09	1.3405E-09	9.3094E-10
**DIRECTION FROM WNW									
1.1817E-06	2.2083E-07	8.9351E-08	4.7012E-08	3.0058E-08	1.1127E-08	3.0426E-09	1.4433E-09	8.9416E-10	6.2184E-10
**DIRECTION FROM NW									
1.7326E-06	3.2640E-07	1.3054E-07	6.6585E-08	4.2229E-08	1.5208E-08	3.9918E-09	1.8798E-09	1.1585E-09	8.0130E-10
**DIRECTION FROM NNW									
2.4100E-06	4.5501E-07	1.9232E-07	1.0242E-07	6.4534E-08	2.2452E-08	5.5906E-09	2.6531E-09	1.6446E-09	1.1452E-09

TABLE 3-5

2002 SSES ANNUAL RELATIVE CONCENTRATIONS 2.26-DAY DECAY, UNDEPLETED X/Q (sec/m^3)

DATES OF LAST X/Q ACCUMULATION ARE FROM 2 1 1 1 0 TO 2123124 0
X/Q ACCUMULATION FOR GROUND DECAYED S.AVG SEC/M3
FOR RELEASE POINT 1

			MILES						
0.5-1	1-2	2-3	3-4	4-5	5-10	10-20	20-30	30-40	40-50
**DIRECTION FROM N									
3.9307E-06	7.5660E-07	3.1501E-07	1.6562E-07	1.0623E-07	3.9107E-08	1.0462E-08	4.8900E-09	2.9659E-09	2.0218E-09
**DIRECTION FROM NNE									
8.4327E-06	1.6861E-06	7.5608E-07	4.0713E-07	2.6285E-07	9.6829E-08	2.5873E-08	1.2148E-08	7.3509E-09	5.0100E-09
**DIRECTION FROM NE									
1.5906E-05	2.9502E-06	1.3342E-06	7.5723E-07	5.0058E-07	1.9556E-07	5.7060E-08	2.7112E-08	1.6448E-08	1.1292E-08
**DIRECTION FROM ENE									
4.9946E-05	8.9827E-06	4.3477E-06	2.5866E-06	1.7253E-06	6.7488E-07	1.8901E-07	8.6561E-08	5.2757E-08	3.6479E-08
**DIRECTION FROM E									
2.0348E-05	3.6872E-06	1.6280E-06	9.1880E-07	6.1032E-07	2.4270E-07	7.2746E-08	3.4236E-08	2.0531E-08	1.3873E-08
**DIRECTION FROM ESE									
1.3050E-05	2.4767E-06	1.1244E-06	6.3211E-07	4.1805E-07	1.6563E-07	4.3792E-08	1.7891E-08	1.0655E-08	7.1498E-09
**DIRECTION FROM SE									
1.0873E-05	2.1016E-06	9.6045E-07	5.4383E-07	3.5934E-07	1.4395E-07	3.4432E-08	1.1902E-08	7.1046E-09	4.7791E-09
**DIRECTION FROM SSE									
9.5873E-06	1.8358E-06	8.2463E-07	4.6787E-07	3.1408E-07	1.3355E-07	3.3930E-08	1.1517E-08	6.9503E-09	4.7189E-09
**DIRECTION FROM S									
7.7871E-06	1.6619E-06	8.1505E-07	4.7355E-07	3.2395E-07	1.4864E-07	3.9926E-08	1.3128E-08	7.9802E-09	5.4489E-09
**DIRECTION FROM SSW									
8.7601E-06	1.7724E-06	8.1649E-07	4.6302E-07	3.0706E-07	1.2695E-07	3.2355E-08	1.1862E-08	7.2438E-09	4.9786E-09
**DIRECTION FROM SW									
6.3693E-06	1.2745E-06	6.0279E-07	3.4448E-07	2.3045E-07	1.0033E-07	2.5326E-08	8.2561E-09	5.0561E-09	3.4766E-09
**DIRECTION FROM WSW									
3.5457E-06	6.8578E-07	3.1850E-07	1.8712E-07	1.2789E-07	6.0051E-08	1.8417E-08	6.6923E-09	3.3179E-09	1.7592E-09
**DIRECTION FROM W									
1.6516E-06	3.1792E-07	1.3673E-07	7.4514E-08	4.8630E-08	1.9651E-08	5.1531E-09	2.0114E-09	1.2071E-09	8.1300E-10
**DIRECTION FROM WNW									
1.1800E-06	2.1987E-07	8.8692E-08	4.6523E-08	2.9654E-08	1.0874E-08	2.9024E-09	1.3330E-09	7.9942E-10	5.3792E-10
**DIRECTION FROM NW									
1.7305E-06	3.2520E-07	1.2974E-07	6.6009E-08	4.1757E-08	1.4922E-08	3.8406E-09	1.7616E-09	1.0573E-09	7.1209E-10
**DIRECTION FROM NNW									
2.4068E-06	4.5315E-07	1.9101E-07	1.0143E-07	6.3733E-08	2.1985E-08	5.3579E-09	2.4710E-09	1.4888E-09	1.0075E-09

TABLE 3-6

2002 SSES ANNUAL RELATIVE CONCENTRATIONS 8-DAY DECAY, DEPLETED X/Q (sec/m^3)

DATES OF LAST X/Q ACCUMULATION ARE FROM 2 1 1 1 0 TO 2123124 0
X/Q ACCUMULATION FOR DECAYED DEPLETION SEC/M3
FOR RELEASE POINT 1

					MILES				
0.5-1	1-2	2-3	3-4	4-5	5-10	10-20	20-30	30-40	40-50
**DIRECTION FROM N									
3.5978E-06	6.4443E-07	2.5716E-07	1.3002E-07	8.0948E-08	2.7996E-08	6.8348E-09	2.8992E-09	1.6383E-09	1.0535E-09
**DIRECTION FROM NNE									
7.7222E-06	1.4380E-06	6.1862E-07	3.2065E-07	2.0113E-07	6.9806E-08	1.7144E-08	7.3753E-09	4.1972E-09	2.7240E-09
**DIRECTION FROM NE									
1.4571E-05	2.5189E-06	1.0935E-06	5.9776E-07	3.8414E-07	1.4165E-07	3.8144E-08	1.6698E-08	9.5818E-09	6.2992E-09
**DIRECTION FROM ENE									
4.5761E-05	7.6739E-06	3.5668E-06	2.0443E-06	1.3260E-06	4.8995E-07	1.2688E-07	5.3675E-08	3.1024E-08	2.0592E-08
**DIRECTION FROM E									
1.8652E-05	3.1541E-06	1.3386E-06	7.2853E-07	4.7102E-07	1.7744E-07	4.9543E-08	2.1750E-08	1.2492E-08	8.1831E-09
**DIRECTION FROM ESE									
1.1962E-05	2.1186E-06	9.2451E-07	5.0125E-07	3.2269E-07	1.2116E-07	2.9865E-08	1.1395E-08	6.5075E-09	4.2398E-09
**DIRECTION FROM SE									
9.9631E-06	1.7959E-06	7.8836E-07	4.3023E-07	2.7652E-07	1.0477E-07	2.3252E-08	7.4589E-09	4.2424E-09	2.7535E-09
**DIRECTION FROM SSE									
8.7825E-06	1.5673E-06	6.7585E-07	3.6934E-07	2.4103E-07	9.6748E-08	2.2697E-08	7.1034E-09	4.0580E-09	2.6408E-09
**DIRECTION FROM S									
7.1310E-06	1.4175E-06	6.6693E-07	3.7298E-07	2.4787E-07	1.0714E-07	2.6434E-08	7.9583E-09	4.5475E-09	2.9550E-09
**DIRECTION FROM SSW									
8.0195E-06	1.5103E-06	6.6704E-07	3.6385E-07	2.3426E-07	9.1058E-08	2.1211E-08	7.0722E-09	4.0325E-09	2.6199E-09
**DIRECTION FROM SW									
5.8288E-06	1.0850E-06	4.9166E-07	2.7009E-07	1.7531E-07	7.1621E-08	1.6449E-08	4.8469E-09	2.7542E-09	1.7792E-09
**DIRECTION FROM WSW									
3.2445E-06	5.8363E-07	2.5965E-07	1.4661E-07	9.7203E-08	4.2816E-08	1.1937E-08	3.9166E-09	1.7999E-09	8.9604E-10
**DIRECTION FROM W									
1.5112E-06	2.7054E-07	1.1144E-07	5.8361E-08	3.6942E-08	1.3997E-08	3.3322E-09	1.1726E-09	6.5157E-10	4.1154E-10
**DIRECTION FROM WNW									
1.0797E-06	1.8711E-07	7.2302E-08	3.6449E-08	2.2537E-08	7.7514E-09	1.8804E-09	7.7980E-10	4.3363E-10	2.7403E-10
**DIRECTION FROM NW									
1.5833E-06	2.7661E-07	1.0567E-07	5.1650E-08	3.1683E-08	1.0607E-08	2.4731E-09	1.0199E-09	5.6525E-10	3.5598E-10
**DIRECTION FROM NNW									
2.2022E-06	3.8556E-07	1.5565E-07	7.9421E-08	4.8400E-08	1.5650E-08	3.4598E-09	1.4369E-09	8.0052E-10	5.0724E-10

TABLE 3-7

2002 SSES ANNUAL RELATIVE DEPOSITION (D/Q meters^{-2})

DATES OF LAST X/Q ACCUMULATION ARE FROM 2 1 1 1 0 TO 2123124 0
X/Q ACCUMULATION FOR DEPOSITION 1/M2
FOR RELEASE POINT 1

			MILES						
0.5-1	1-2	2-3	3-4	4-5	5-10	10-20	20-30	30-40	40-50
**DIRECTION FROM N									
2.4958E-08	3.6775E-09	1.5082E-09	7.1487E-10	4.2248E-10	1.3389E-10	3.2031E-11	1.1793E-11	6.2945E-12	3.9544E-12
**DIRECTION FROM NNE									
3.3829E-08	5.2416E-09	2.2734E-09	1.0813E-09	6.3653E-10	1.9833E-10	4.6234E-11	1.7023E-11	9.0855E-12	5.7079E-12
**DIRECTION FROM NE									
3.6288E-08	5.4732E-09	2.3402E-09	1.1327E-09	6.7199E-10	2.1647E-10	5.3040E-11	1.9528E-11	1.0423E-11	6.5481E-12
**DIRECTION FROM ENE									
6.7581E-08	1.0494E-08	4.6732E-09	2.2863E-09	1.3507E-09	4.2745E-10	9.7405E-11	3.4154E-11	1.8229E-11	1.1452E-11
**DIRECTION FROM E									
3.0620E-08	4.4728E-09	1.8223E-09	8.7011E-10	5.1915E-10	1.7121E-10	4.3349E-11	1.5960E-11	8.5186E-12	5.3517E-12
**DIRECTION FROM ESE									
2.3545E-08	3.5592E-09	1.5175E-09	7.3262E-10	4.3770E-10	1.4514E-10	3.2976E-11	1.0649E-11	5.6839E-12	3.5708E-12
**DIRECTION FROM SE									
2.6544E-08	4.0334E-09	1.7616E-09	8.6991E-10	5.2218E-10	1.7644E-10	3.6720E-11	1.0050E-11	5.3641E-12	3.3699E-12
**DIRECTION FROM SSE									
2.7410E-08	4.0914E-09	1.7429E-09	8.6061E-10	5.2451E-10	1.8778E-10	4.1194E-11	1.0949E-11	5.8438E-12	3.6713E-12
**DIRECTION FROM S									
2.8706E-08	4.6023E-09	2.1614E-09	1.1108E-09	6.9228E-10	2.6794E-10	6.2536E-11	1.6042E-11	8.5622E-12	5.3791E-12
**DIRECTION FROM SSW									
4.2176E-08	6.4510E-09	2.8935E-09	1.4647E-09	8.8656E-10	3.0933E-10	6.8717E-11	1.9610E-11	1.0467E-11	6.5755E-12
**DIRECTION FROM SW									
5.2457E-08	8.3273E-09	3.9178E-09	2.0272E-09	1.2526E-09	4.7089E-10	1.0638E-10	2.7100E-11	1.4464E-11	9.0870E-12
**DIRECTION FROM WSW									
3.2819E-08	5.0589E-09	2.3627E-09	1.2649E-09	8.0423E-10	3.3167E-10	9.3340E-11	2.6969E-11	1.1807E-11	5.7918E-12
**DIRECTION FROM W									
1.3703E-08	2.0568E-09	8.8997E-10	4.4410E-10	2.7066E-10	9.6901E-11	2.3644E-11	7.4082E-12	3.9540E-12	2.4841E-12
**DIRECTION FROM WNW									
9.9121E-09	1.4302E-09	5.7629E-10	2.7542E-10	1.6362E-10	5.3006E-11	1.3093E-11	4.8208E-12	2.5730E-12	1.6165E-12
**DIRECTION FROM NW									
1.5476E-08	2.2656E-09	9.0774E-10	4.2227E-10	2.4966E-10	7.9260E-11	1.9011E-11	6.9997E-12	3.7360E-12	2.3471E-12
**DIRECTION FROM NNW									
2.0937E-08	3.1094E-09	1.3137E-09	6.3510E-10	3.7201E-10	1.1340E-10	2.5521E-11	9.3964E-12	5.0152E-12	3.1507E-12

TABLE 3-8

2002 ATMOSPHERIC DISPERSION ESTIMATES FOR RETDAS INPUT AT SELECTED LOCATIONS

AFFECTED SECTOR	LOCATION	MILES	X/Q[1]	X/Q DEC[2]	X/Q DEC+DEP[3]	DEPOSITION[4]
12/WSW	Maximum (X/Q) Site Boundary	1.22	1.244E-05	1.234E-05	1.068E-05	1.482E-08
9/S	Closest (X/Q) Site Boundary	0.38	5.573E-06	5.568E-06	5.189E-06	3.779E-08
12/WSW	Maximum (X/Q) Residence	1.1	1.458E-05	1.446E-05	1.260E-05	1.761E-08
3/NE	Maximum (D/Q) Residence	0.9	2.742E-06	2.733E-06	2.406E-06	1.988E-08
12/WSW	Maximum (D/Q) Garden	1.1	1.458E-05	1.446E-05	1.260E-05	1.761E-08
10/SSW	Maximum (D/Q) Dairy	3.0	5.435E-07	5.352E-07	4.289E-07	1.504E-09
2/NNE	Maximum (D/Q) Meat Producer	2 3	9.612E-07	9.519E-07	7.830E-07	3.388E-09
3/NE	Riverlands / EIC	0.7	3.959E-06	3.949E-06	3.535E-06	3.030E-08
12/WSW	Tower's Club	0.5	3.959E-05	3.947E-05	3.616E-05	5.339E-08
5/E	East Gate	0 5	1.785E-06	1.782E-06	1.631E-06	1.479E-08

NEAREST RESIDENCE WITHIN A 5-MILE RADIUS OF SSES BY SECTOR

SECTOR NUMBER	AFFECTED SECTOR	NAME	MILES	X/Q[1]	X/Q DEC[2]	X/Q DEC+DEP[3]	DEPOSITION[4]
1	N	H. Burd	1.3	2.028E-06	2.014E-06	1.734E-06	5.789E-09
2	NNE	E. Ashbridge III	1.0	3.211E-06	3.196E-06	2.797E-06	1.290E-08
3	NE	W. Tuggle	0.9	2.742E-06	2.733E-06	2.406E-06	1.988E-08
4	ENE	D. Barberi	2.1	4.147E-07	4.126E-07	3.409E-07	3.051E-09
5	E	L. Kozlowski	1.4	3.512E-07	3.497E-07	2.990E-07	2.298E-09
6	ESE	R. Panetta	0 5	1.274E-06	1.272E-06	1.164E-06	1.068E-08
7	SE	J. Futoma	0 5	1.636E-06	1.634E-06	1.494E-06	1.461E-08
8	SSE	J. Naunczek	0 6	1.919E-06	1.916E-06	1.732E-06	1.602E-08
9	S	S. Slusser	1.0	1.429E-06	1.423E-06	1.244E-06	7.632E-09
10	SSW	S. Molnar	0 9	3.679E-06	3.660E-06	3.227E-06	1.281E-08
11	SW	F. Michael	1.5	2.993E-06	2.967E-06	2 533E-06	5.504E-09
12	WSW	W. Kisner	1.1	1.458E-05	1.446E-05	1.260E-05	1.761E-08
13	W	E. Seely/F. Hummel	1.2	5.340E-06	5.286E-06	4.586E-06	6.700E-09
14	WNW	R. Orlando	0.8	6 914E-06	6.864E-06	6.109E-06	1.124E-08
15	NW	L. Hidlay	0.8	5.834E-06	5.798E-06	5.156E-06	1.277E-08
16	NNW	W. Metzler	0.6	6.380E-06	6.355E-06	5.754E-06	1.743E-08

NEAREST GARDEN WITHIN A 5-MILE RADIUS OF SSES BY SECTOR

SECTOR NUMBER	AFFECTED SECTOR	NAME	MILES	X/Q[1]	X/Q DEC[2]	X/Q DEC+DEP[3]	DEPOSITION[4]
1	N	J. Wojcik	3.2	5.464E-07	5.375E-07	4.276E-07	1.302E-09
2	NNE	R. Chapin	2.3	9.612E-07	9.519E-07	7.830E-07	3.388E-09
3	NE	Yokum	2.7	5.468E-07	5.419E-07	4.380E-07	3.442E-09
4	ENE	G. Dennis	2.4	3.456E-07	3 432E-07	2.807E-07	2.544E-09
5	E	L.Kozlowski/W.Witts	1.4	3.512E-07	3.497E-07	2.990E-07	2.298E-09
6	ESE	L. Travelpiece	2.5	8.902E-08	8.836E-08	7.203E-08	5.741E-10
7	SE	F. Scholl	0.6	1.254E-06	1.252E-06	1.132E-06	1.074E-08
8	SSE	D. Dawson	1.5	4.422E-07	4.404E-07	3.747E-07	3 022E-09
9	S	M. Cope	1.1	1.230E-06	1.225E-06	1.064E-06	6 419E-09
10	SSW	S. Bodnar	1.2	2.370E-06	2.355E-06	2.038E-06	7.711E-09
11	SW	H. Schultz	1.9	2.102E-06	2.077E-06	1.740E-06	3.755E-09
12	WSW	W. Kisner	1.1	1.458E-05	1.446E-05	1.260E-05	1.761E-08
13	W	E. Seely/F. Hummel	1.2	5.340E-06	5.286E-06	4.586E-06	6.700E-09
14	WNW	P. Moskaluk, Jr.	1.3	3.164E-06	3.130E-06	2.702E-06	4.634E-09
15	NW	D. Goff	1.8	1.633E-06	1.613E-06	1.359E-06	3.046E-09
16	NNW	P. Culver	4.0	3.787E-07	3.696E-07	2.874E-07	6.457E-10

TABLE 3-8
(continued)

NEAREST ANIMAL RAISED FOR MEAT CONSUMPTION WITHIN A 5-MILE RADIUS OF SSES BY SECTOR

SECTOR NUMBER	AFFECTED SECTOR	NAME	MILES	X/Q[1]	X/Q DEC[2]	X/Q DEC+DEP[3]	DEPOSITION[4]
2	NNE	R. Chapin	2.3	9.612E-07	9.519E-07	7.830E-07	3.388E-09
4	ENE	G Dennis	2.4	3 453E-07	3 428E-07	2 804E-07	2.542E-09
5	E	K. Kozlowski/ W. Witts	1.4	3.512E-07	3 498E-07	2.990E-07	2.299E-09
10	SSW	R. & C. Ryman	3.0	5.435E-07	5.352E-07	4.289E-07	1.504E-09
		C. K. Drasher	3.5	3.834E-07	3.766E-07	2.966E-07	1.000E-09
15	NW	D. Goff	1.8	1.633E-06	1.613E-06	1.359E-06	3.046E-09

ALL DAIRY LOCATIONS NEAR SSES

SECTOR NUMBER	AFFECTED SECTOR	NAME	MILES	X/Q[1]	X/Q DEC[2]	X/Q DEC+DEP[3]	DEPOSITION[4]
5	E	W. Bloss	4.5	4 843E-08	4 781E-08	3 632E-08	2 661E-10
6	ESE	D. Moyer	2.7	7.680E-08	7.618E-08	6.154E-08	4 845E-10
		F. Rinehimer	4.2	3.102E-08	3 063E-08	2.347E-08	1.723E-10
10	SSW	R. & C. Ryman	3.0	5.435E-07	5.352E-07	4.289E-07	1.504E-09
		R. Ryman	3.1	5.059E-07	4 979E-07	3.975E-07	1.383E-09
		C. K. Drasher	3.5	3.834E-07	3.766E-07	2.966E-07	1.000E-09
		K. Davis	14.0	3.175E-08	2.947E-08	1.969E-08	5.337E-11
13	W	J. & N. Dent	5.0	4.921E-07	4.729E-07	3.609E-07	3.869E-10
16	NNW	H. Shoemaker	4.2	3.550E-07	3.460E-07	2.676E-07	5.933E-10

1	X/Q	RELATIVE CONCENTRATION (SEC/M^3)
2	X/Q DEC	DECAYED AND UNDEPLETED, HALF-LIFE 2.26 DAYS (SEC/M^3)
3	X/Q DEC+DEP	DECAYED AND DEPLETED, HALF-LIFE 8 DAYS (SEC/M^3)
4	DEPOSITION	RELATIVE DEPOSITION RATE (1/M^2)

SSES 2002 ANNUAL WIND ROSE 10M LEVEL – PRIMARY TOWER

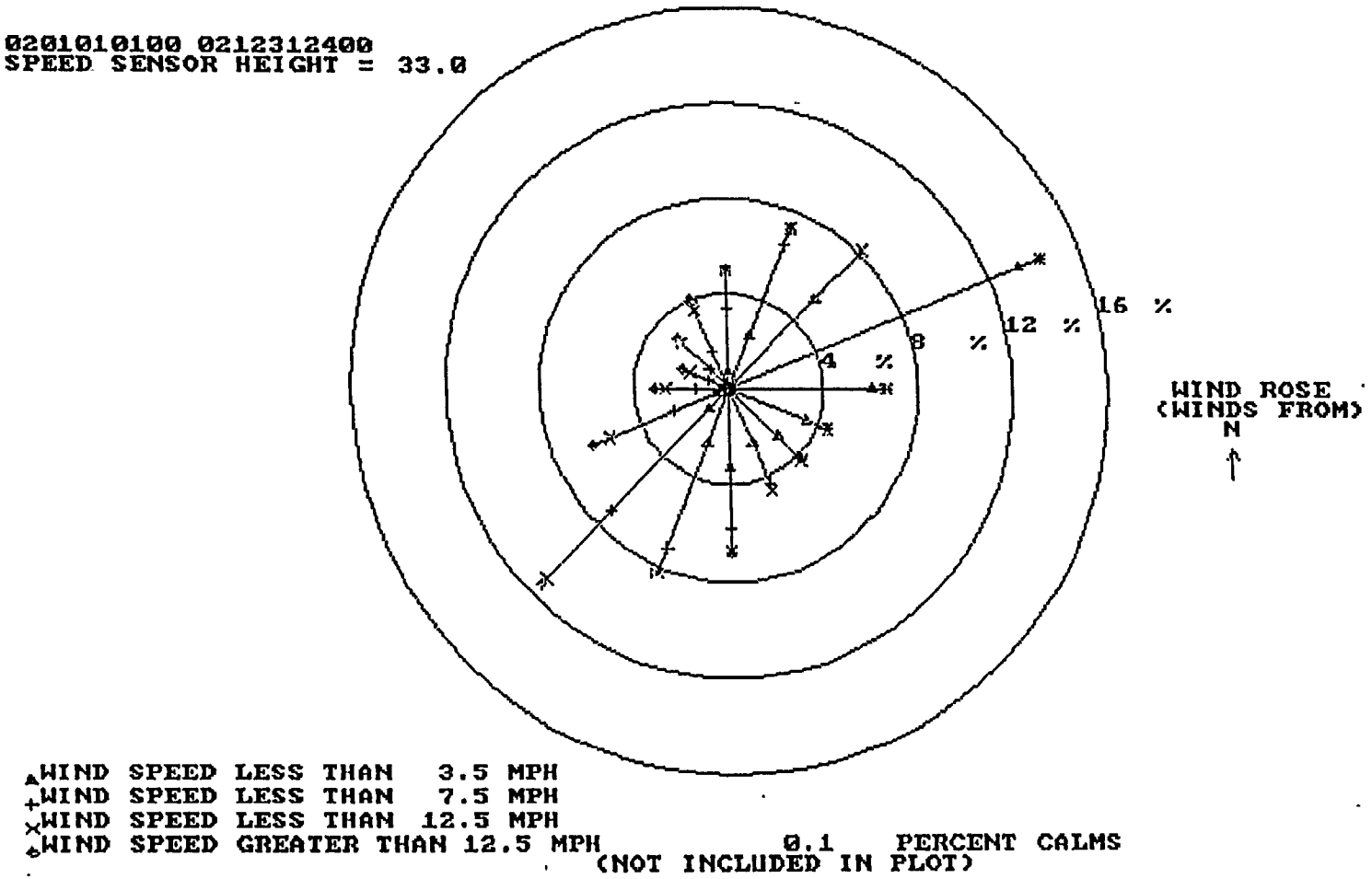


FIGURE 3-1

This wind rose displays the frequency of hourly average wind direction from a given sector. In 2002, the predominant wind direction occurred 14.5% of the time from the ENE sector. The average wind speed was 4.9 mph. The peak sector wind speed was 8.5 mph from the WSW.

SSES 2002 ANNUAL WIND ROSE 60M LEVEL – PRIMARY TOWER

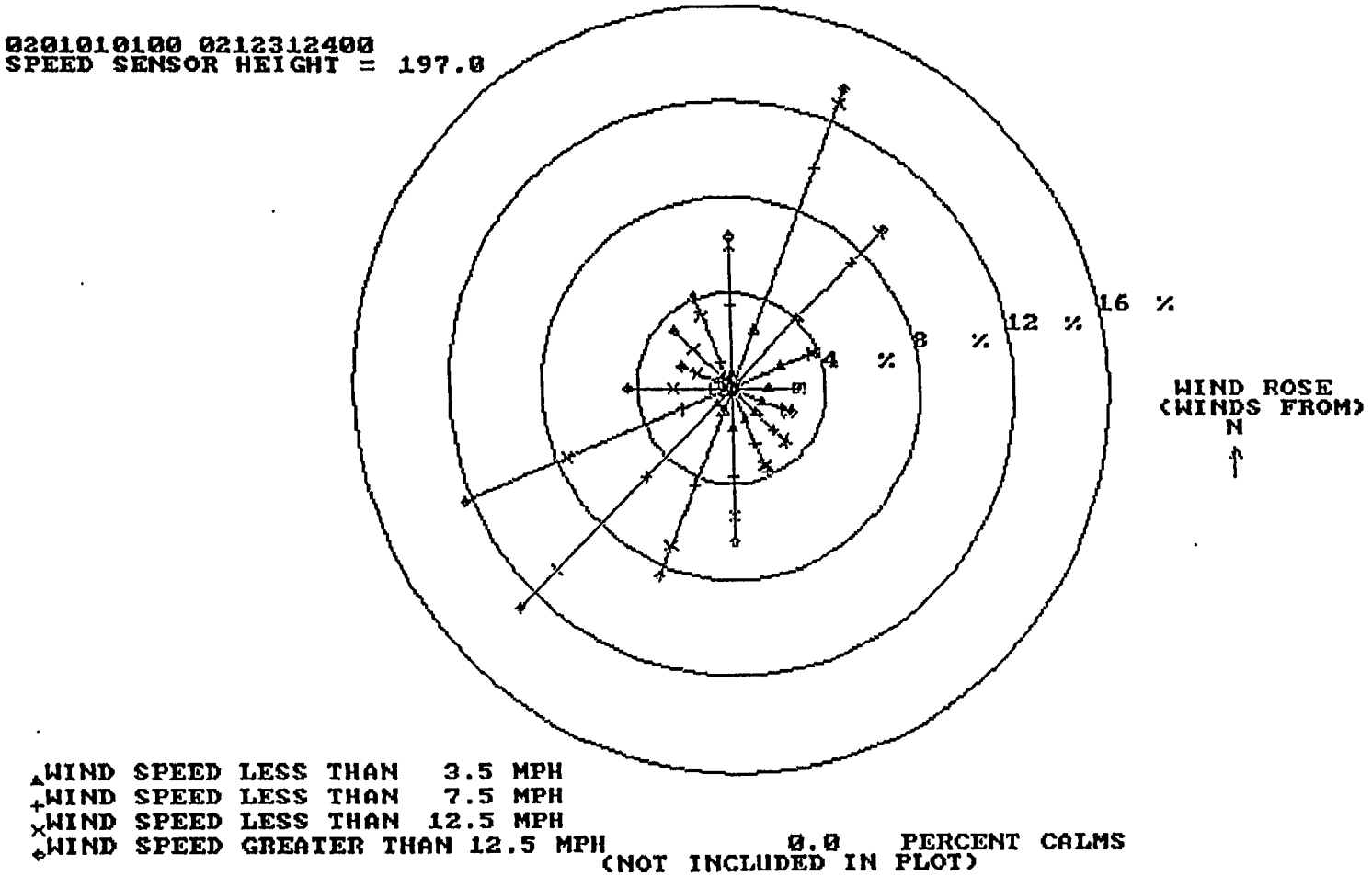


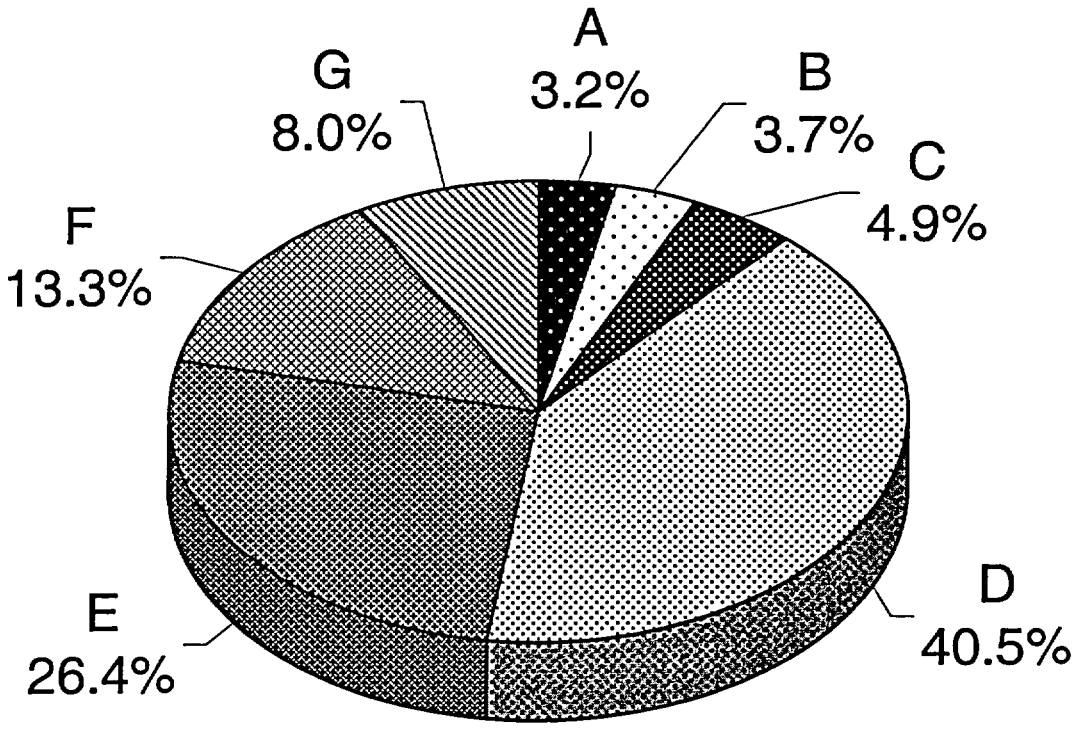
FIGURE 3-2

This wind rose displays the frequency of hourly average wind direction from a given sector. In 2002, the predominant wind direction occurred 13.5% of the time from the NNE sector. The average wind speed was 7.8 mph. The peak sector wind speed was 12.0 mph from the W.

FIGURE 3-3

SSES PASQUIL STABILITY CLASS PREVALENCES DATA
Period: 2002

SSES Joint Frequency Distributions at 10 Meters
Wind Speed and Direction 10M vs. Delta Temperature 60-10M
(Based on 8,675 Valid Hours)



SECTION 4

DOSE MEASUREMENTS AND ASSESSMENTS

Radiological Impact on Man

Sampling and analysis of airborne and waterborne effluents were performed in accordance with the frequencies, types of analysis, and Lower Limit of Detection (LLD) outlined in the SSES Technical Requirements.

Radioactive material was detected in some of the airborne and waterborne effluent samples analyzed. Dose calculations using measured effluent activity levels, meteorological data from the current reporting period and average river flow dilution factors resulted in estimated doses to individuals at levels below 10 CFR 20 and 10 CFR 50, Appendix I limits. Direct radiation resulting from plant operation, as measured by environmental thermoluminescent dosimeters located around the plant contributed a maximum of 2.99E-2 mrem (measured at TLD Location 9S2) at the Protected Area Boundary south of the plant. The maximum organ/total body dose including thyroid from all airborne effluent is 1.27E0 mrem (CHILD, LUNG Table 4-4). The maximum organ/total body dose from liquid effluent is 6.06E-3 mrem (ADULT, GI-LLI: two times the unit dose shown Table 4-2). Conservatively adding the maximum total body/organ dose from liquid and gaseous effluent (even though different age groups) and the maximum total body dose determined from direct radiation bounds the dose that any member of the public receives from operation of SSES. The result (1.31E 00 mrem) is 5.2% of the 40CFR190 limit of 25 mrem to total body/organ (except thyroid) and 1.7% of the 40CFR190 limit of 75 mrem to the thyroid.

Doses to a maximally exposed member of the public from waterborne effluents are calculated for fish ingestion and shoreline exposure at the plant outfall, and drinking water ingestion at Danville, PA. Site specific parameters used in the calculations for the Danville receiver, specific for actual average blowdown and river level for the entire year are shown in Table 4-1.

TABLE 4-1

SITE-SPECIFIC PARAMETERS USED FOR RETDAS CALCULATIONS (DANVILLE RECEIVER) FOR 2002

PARAMETER	ENTIRE YEAR
Cooling Tower Blowdown (CFS)	17.5
Average Net River Level (ft.)	6.8
Dilution Factor at Danville[1]	413.2
Transit time to Danville (hr.)[1]	24.7

[1]From ODCM-QA-005, Att. D

Summaries of maximum individual doses resulting from airborne and waterborne radioactive effluent releases are given in Table 4-2. Meteorological data from Section 3 were used to calculate the dose from airborne effluents.

Technical Specifications 5.5.4 require assessment of radiation doses from radioactive airborne and waterborne effluent to members of the public within the site boundary. There are no significant exposure pathways from waterborne effluents in these areas. Onsite doses are assessed relative to offsite dose values and are adjusted for appropriate dispersion and occupancy factors. Summaries of the calculated maximum doses within the site boundary and selected locations resulting from airborne effluents are presented in Tables 4-3 through 4-4.

SSES Technical Specification 5.5.4 requires that the Annual Radioactive Effluent and Waste Disposal Report include an assessment of the radiation dose from radioactive effluents to members of the public within the site boundary. Within the SSES Site Boundary there are several areas frequented by members of the public. Doses from airborne effluent are calculated for members of the public for the following locations: SSES Riverlands Energy Information Center, the Guard House at access Gate No. 10, the Towers Club, the Kisner Farm and the site boundary with the maximum X/Q value. The above referenced locations are shown on Figure 4-1.

In the area comprising the Riverlands recreation area, which surrounds the Energy Information Center, three pathways of radiation exposure can be identified: plume, ground, and inhalation. There are no significant exposure pathways from waterborne effluents in this area. There are approximately 100,000 visitors to the Riverlands/Information Center complex each year. For dose calculations, it is assumed the visitor stays in the area for one hour.

Use of the RETDAS code yields calculated doses for the Riverlands area for the report period. These doses are the total doses at the location from gaseous effluents during the report period.

TABLE 4-2

SUMMARY OF MAXIMUM INDIVIDUAL DOSES TO MEMBERS OF THE PUBLIC
DATA PERIOD: 1/1/02 TO 12/31/02

EFFLUENT	AGE GROUP	APPLICABLE ORGAN	ESTIMATED MAXIMUM DOSE (MREM)	LOCATION		PERCENT OF LIMIT	LIMIT (MREM)[2]
				DIST (MILES)	AFFECTED SECTOR		
Liquid[1]	Child	Total Body	1.05E-3	(3)		0.04	3
Liquid[1]	Adult	GI-LLI	3.03E-3	(3)		0.03	10
Noble Gas[4]	N/A	Air Dose (Gamma-MRAD)	1.13E-1	0.5	WSW	1.13	10
Noble Gas[4]	N/A	Air Dose (Beta-MRAD)	3.99E-2	0.5	WSW	0.2	20
Airborne Iodine, Tritium and Particulates [4]	Child	Lung	1.27E 0	0.5	WSW	8.5	15

[1]Estimated dose is based on a site total activity release equally divided between Unit 1 and Unit 2.

[2]10 CFR 50, Appendix I limits are in terms of mrad or mrem/reactor-year for airborne effluent and mrem per year for waterborne effluent from each unit.

[3]Doses from liquid effluent are estimated from fish ingestion and shoreline exposure at the site outfall and from the drinking water pathway at Danville, PA.

[4]Estimated dose is based on the site total activity release.

TABLE 4-3

CALCULATED COLLECTIVE DOSES TO MEMBERS OF THE PUBLIC WITHIN THE RIVERLANDS/INFORMATION CENTER COMPLEX
DATA PERIOD: 1/1/02 TO 12/31/02

EFFLUENT	AGE GROUP	APPLICABLE ORGAN	DOSE RATE[1] (MREM/HR)	COLLECTIVE DOSE[2] (PERSON-REM)
Noble Gas	N/A	Total Body	1.29E-06	1.29E-04
Noble Gas	N/A	Skin	4.55E-07	4.55E-05
Iodine, Tritium and Particulates	Child	Total Body	1.87E-05	1.87E-03

[1]Estimated dose and dose rate is based on annual site total activity release.

[2]Collective dose is based on occupancy of 100,000 person-hours.

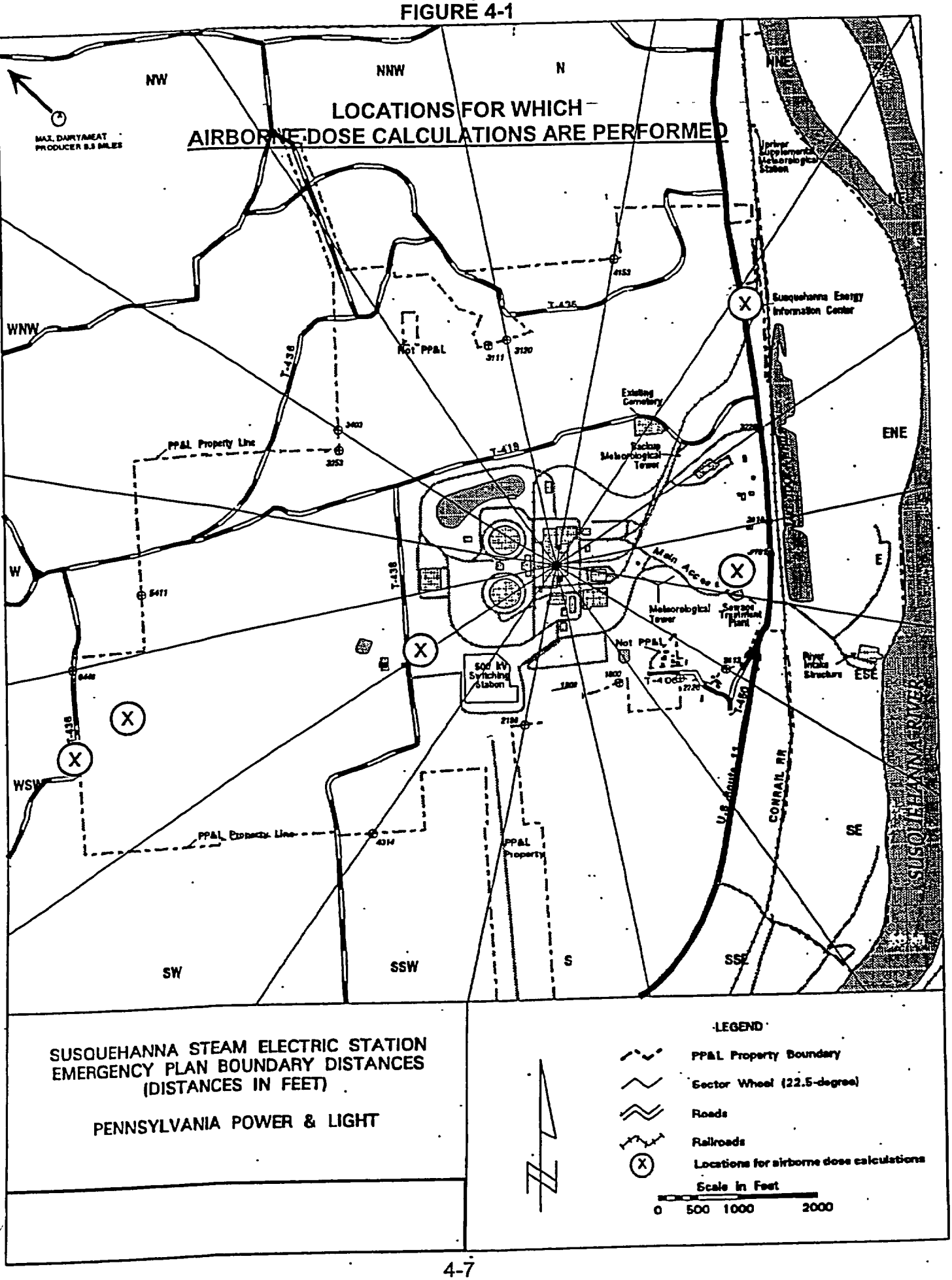
TABLE 4-4

SUMMARY OF MAXIMUM INDIVIDUAL DOSES FROM AIRBORNE EFFLUENT

LOCATION	PATHWAY	MAXIMUM TOTAL BODY DOSE (MREM)		MAXIMUM ORGAN DOSE (MREM)		MAXIMUM THYROID DOSE (MREM)	
1. Maximum site boundary X/Q	Total (All)	3.96E-01	(CHILD)	3.96E-01	(CHILD, LUNG)	3.90E-01	(CHILD)
2. Maximum X/Q Residence & Maximum D/Q Garden	Total (All)	4.65E-01	(CHILD)	4.64E-01	(CHILD, LUNG)	4.58E-01	(CHILD)
3. Maximum D/Q Dairy	Total (All)	1.86E-02	(CHILD)	1.82E-02	(CHILD, GI-LLI)	1.80E-02	(CHILD)
4. Maximum D/Q Meat	Total (All)	3.39E-02	(CHILD)	3.32E-02	(CHILD, GI-LLI)	3.25E-02	(CHILD)
5. Tower's Club	Total (All)	1.27E 00	(CHILD)	1.27E 00	(CHILD, LUNG)	1.25E 00	(CHILD)
6. Riverland/EIC	Total (All)	1.64E-01	(CHILD)	1.57E-01	(CHILD, GI-LLI)	1.51E-01	(CHILD)
7. Gate No. 10 Guard House	Total (All)	7.55E-02	(CHILD)	7.22E-02	(CHILD, GI-LLI)	6.95E-02	(CHILD)

Note: The doses shown above are based on 100% occupancy at the indicated locations.
Note: The doses shown above are based on a composite of all applicable pathways resulting in a total dose to the maximally exposed individual.

FIGURE 4-1



SUSQUEHANNA STEAM ELECTRIC STATION
EMERGENCY PLAN BOUNDARY DISTANCES
(DISTANCES IN FEET)

PENNSYLVANIA POWER & LIGHT

SECTION 5

CHANGES TO THE OFFSITE DOSE CALCULATION MANUAL (ODCM), TECHNICAL REQUIREMENTS MANUAL (TRM) AND THE SOLID RADIOACTIVE WASTE PROCESS CONTROL PROGRAM

CHANGES TO THE OFFSITE DOSE CALCULATION MANUAL

The SSES ODCM consists of nine (9) individual procedures. Revision 1 to ODCM-QA-001, "ODCM Introduction" became effective on April 14, 2002. This revision incorporated the following changes:

1. Updated position titles and responsibilities.

2. Updated the reference section.

3. Removed "Gray Shading" from ITS implementation.

4. Additional changes of a minor editorial nature were made to Sections 2.1 and 2.4.

A change was made to Revision 1 of ODCM-QA-002, "ODCM Review and Revision Control" on June 6, 2002. This change provided clarification that 10CFR50.59 and 10CFR72.48 screens are not needed for ODCM changes. This change is in conjunction with guidance provided in SSES Technical Specifications section 5.5.1. Additionally, position titles and responsibilities were updated as part of the change to ODCM-QA-002.

The following ODCM procedures (with corresponding revision numbers) were revised and effective on September 20, 2002;
ODCM-QA-003 Rev. 1, ODCM-QA-004 Rev. 2, ODCM-QA-005 Rev. 2, ODCM-QA-006 Rev. 1, ODCM-QA-007 Rev. 1. Outlined below is a summary of the changes to the above referenced ODCM revisions:

1. Revised liquid effluent dose calculation methodology to reflect the actual methodology of Regulatory Guide 1.109. Provided a consolidated version of the referenced methodology for liquid effluent dose calculation, which reflects the methodology, utilized by a newly implemented offsite dose computer program (RETDAS).

2. Revised gaseous effluent noble gas dose calculation methodology to reflect the actual methodology of NUREG-0133. Revised methodology is more conservative and reflects the methodology utilized in the RETDAS program.

3. Gaseous effluent dose factors revised. Minor differences between the current gaseous effluent dose factors and the RETDAS gaseous effluent dose factors. Minor differences due to use of default values in Reg. Guide 1.109 in lieu of site specific values currently utilized.

4. Revised the liquid effluent dose factors. The river dilution factor and transit time are values in current ODCM dose factor calculation. These parameters are part of the RETDAS liquid effluent dose calculation, not part of the derivation of the dose factor value.

5. Added system flow-paths for liquid and gaseous effluents per NRC Effluent Inspection 2002-02.

6. The RETDAS program utilizes a larger isotopic library than that which is listed in the current SSES ODCM. The additional isotopes and corresponding dose factor values have been incorporated into the ODCM revision.

7. Incorporated Insignificant Effluent Pathway dose calculation methodology.

8. Revised liquid effluent dose factor for P-32 (Phosphorous 32) and deleted reference to analyze for P-32 in liquid effluent composite samples. Technical justification (which includes NRC Technical Paper) for P-32 changes added to ODCM as supporting reference.

9. Minor typographical errors, administrative title and responsibility updates and additional references incorporated.

Revision 4 to ODCM-QA-008, "Radiological Environmental Monitoring Program", became effective on June 11, 2002. This revision incorporated the following changes:

1. Incorporated explanation of regulatory basis for REMP equations 1 through 4.

2. Deleted REMP sampling location "12G1" from Attachment B. This location has never been a required monitoring location.

3. Updated the description of monitoring location "2B3" from "Durabond Corporation" To "Legett & Platt".

4. Replaced milk sampling location 10D3 with location 12B2 in Attachments B and C. This change is in response to the result of an annual surveillance that evaluated the dose potentials of dairy farms in the vicinity of the SSES for any airborne activity that might be released from the SSES. This surveillance determined that location 12B2 has a significantly greater dose potential than 10D3.

5. Additional references incorporated.

Revision 1 to ODCM-QA-009 became effective on May 24, 2002. This revision included the following changes:

1. Deleted old Technical Specification statements and references and removed shading from Improved Technical Specification statements.

2. Deleted Approval/date box, which is not required by Improved Technical Specifications.

3. Sections 2.1.2 and 2.1.3 – Revised to reflect deletion of old Attachment A.

4. Section 2.1.3 – Moved definition of 80-10 systems to Section 5.

5. Section 3 – Added references to NDAP-QA-1180, Condition Report #95876, Unit 1 and Unit 2 Technical Requirements Manual, NRC Generic Letter 91-18, and Condition Report 95876. Deleted reference to Safety Evaluation NL-90-029.

6. Section 5.1 – Clarified subject definition based on TRM.

7. Section 5.4 - Clarified definition of Significant Effluent Pathway.

8. Section 5.5 – Added definition of 80-10 Systems.

9. Section 6.0 – Changed reference to Nuclear Department to PPL Susquehanna.

10. Deleted Attachment A- Systems Classified as Not an Effluent Pathway; there is no requirement to include this attachment.

11. Attachment B – Systems Classified as Insignificant Effluent Pathway revised to Attachment A and updated.

12. Attachments C and D revised to Attachments B and C. Systems updated and references added to Attachments C and D.

CHANGES TO THE TECHNICAL REQUIREMENTS MANUAL

Section 3.11 of the SSES Technical Requirements Manual (TRM) by reference is part of the ODCM. The following limits and requirements are contained in Section 3.11: liquid and gaseous effluent dose limits, liquid and gaseous effluent treatment system operability criteria (based on effluent dose), liquid and gaseous effluent radiation monitor operability criteria and the conduct of the Radiological Environmental Monitoring Program.

In 2002, TRM Sections 3.11.2.4 and 3.11.2.5 were revised and became effective on April 2, 2002. These revisions included the following changes:

1. Editorial and administrative corrections to make the format consistent with the Writer's Guide for Standard Technical Specifications.

2. The Bases to the referenced Sections has been expanded to be more reflective of the specific requirements of the TRO, Conditions, Required Actions, TRS's, and Notes, and to make format, wording, and punctuation consistent with the Writer's Guide.

3. Throughout the Bases, the term "shall," is replaced with the term, "should" (or another equivalent term) because "shall" implies a requirement, and the intent of the Bases is to provide clarification.

4. TRS 3.11.2.4 Bases incorrect reference to "monitoring instrumentation" is changed to "GASEOUS RADWASTE TREATMENT SYSTEM".

5. TRS 3.11.2.5 Bases incorrect reference to "monitoring instrumentation" is changed to "VENTILATION EXHAUST TREATMENT SYSTEM".

PROCESS CONTROL PROGRAM CHANGES

The following changes were made to the Process Control Program and implementing procedures during 2002. None of the changes reduce the overall conformance of the solidified waste product to existing criteria for solid wastes. All changes were reviewed and approved by PORC (if necessary). The following procedures were changed:

1. NDAP-QA-0646, Solid Radioactive Waste Process Control Program (Effective 04/19/2002, PORC Meeting No. 02-04-11)

2. WM-PS-100, Shipment of Radioactive Waste (Effective 08/13/2002)

3. WM-PS-160, Radwaste Curie Calculations (Effective 02/19/2002, PORC Meeting No. 02-02-14)

4. WM-PS-210, Packaging and Loading of DAW and Radioactive Material (Effective 02/19/2002, PORC Meeting No. 02-03-14)

5. WM-PS-345, Use of the Chem Nuclear or Vectra 14-190H (NUPAC 14/190)(USA/9159/A) Shipping Package (Effective 03/08/2002, PORC Meeting No. 02-03-07)

6. WM-RP-009, Combustible Gas Detection in Processing Liners and High Integrity Containers (Effective 06/13/2002)

7. WM-RP-104, Transfer and Dewatering Ion Exchange Resin for Resin Express Processing (Effective 05/13/2002)

8. WM-RP-107, Transfer and Drying Powered Resin (Effective 02/19/2002, PORC Meeting No. 02-02-14)

NDAP-QA-0646 continues to fully implement the requirements and intent of the following:

1. Sections 11.4 and 13.5 of the FSAR
2. Section 3.7.4 of the Technical Requirements Manual
3. 10 CFR 20, 10 CFR 61, 10 CFR 71, 49 CFR 100-177, and 40 CFR 261

Compliance with all applicable regulatory requirements listed above continues to be met as the result of these changes to the program. These changes to the Process Control Program will not reduce the overall conformance of the solidified waste product to existing criteria for solid wastes.

PROCEDURE REVISION SUMMARY
NDAP-QA-0646, Revision 6

1. Add reference and clarify PCP change evaluation requirements to be in accordance with changes to NDAP-QA-0726, 10 CFR 50.59 and 10 CFR 72.48 Evaluations.

2. Implement Licensing Commitment Change # 3376 to clarify that changes to PCP implementing procedures do not require PORC review consistent with the guidance in NDAP-QA-002, Nuclear Department Procedure Program, Attachment K.

3. Add reference to ODCM-QA-001, ODCM introduction, change requirements to Section 6.15 and Section 6.19 to clarify requirements for completing the Annual Solid Radioactive Waste Report and changes to the PCP. This change implements corrective actions for Audit #2001-013 Finding #376192.

4. These changes to the PCP do not reduce the overall conformance of the solidified waste product to existing criteria for solid radwaste. The changes are administrative in nature and are made to clarify the relationship of the PCP with other, approved procedures and to clarify requirements for reporting changes in the Annual Radwaste Report.

5. Change number 1 completes implementation of the revised 10 CFR 50.59 / 10 CFR 72.48 evaluation process with regards to changes to the PCP. This change ensures the proper change mechanisms are referenced in the PCP with regard to evaluations of process or operational changes that may impact the final waste product.

6. Change number 2 implements a clarification on the review requirements of PCP implementing procedures. The intent of Improved Technical Specifications was to move the Process Control Program under the administrative control of the OQA program and define the PCP as NDAP-QA-0646. This would eliminate unnecessary and burdensome Technical Specification changes when radwaste processing technology or procedures changed. The OQA program contains sufficient controls to ensure changes to the PCP and implementing procedures are adequately and appropriately reviewed. However, during the submittal of the ITS, a response to NRC questions inadvertently committed PORC to review all implementing procedures of the PCP and not only NDAP-QA-0646. This commitment was discovered during a previous submittal of this change to PORC. Regulatory Commitment Change # 3376 was approved on 3/6/02 to rescind this commitment. This change reaffirms the original intention of ITS to control NDAP-QA-0646 as the PCP which requires PORC review. Implementing procedures do not implement any new requirements and so do not require PORC review.

7. Change number 3 corrects procedure deficiencies noted in Radwaste Audit 2001-013 Finding # 376192 with regards to instructions for submittal of information on the Annual Solid Radwaste Report. NDAP-QA-0646 did not contain adequate guidance to ensure the requirements of FSAR Section 13.4.4.1 were met. The change corrects this condition by inserting appropriate references to ODCM-QA-001, which is required by Technical Specification 5.6.3 to contain the guidance for this report. ODCM-QA-001 Revision 1 contains all of the requirements to ensure a proper report is made.

PROCEDURE REVISION SUMMARY
WM-PS-100, Revision 7

1. Incorporated recommendations from Audit #2001-013 (Recommendation #'s 376218 and 376219).

2. Added use of RADMAN computer program to determine hydrogen generation calculation in step 6.4.7.e.

3. Updated vendor's name on FORM WM-PS-100-14. Included various administrative changes.

PROCEDURE REVISION SUMMARY
WM-PS-160, Revision 3

1. Implement new scaling factors for Dry Active Waste, Condensate/Radwaste Bead Resin, Chemical Waste Processing Bead Resin/Charcoal, URC and LRW Filter Media.

PROCEDURE REVISION SUMMARY
WM-PS-201, Revision 5

1. Clarified requirements for weighing bags containing water or asbestos.

2. Added new material to be used as an absorbent (AquaSorbe)

3. Added item to have bags of asbestos placed in an inner metal drum due to recent industry experience.

4. Revised Form WM-PS-201-1 for clarification.

PROCEDURE REVISION SUMMARY
WM-PS-345, Revision 2

1. Deleted use of cask as an NRC Type A package (NRC no longer regulates Type A packages). Procedure changed to allow cask to be used as a Type A package, Industrial Package I, Industrial Package II, or a Strong Tight Package.

2. Updated vendor name from Vectra to ATG. Various administrative changes.

3. Updated primary and secondary lid gasket requirements in accordance with vendor procedures.

4. Changed drain port torquing requirement in accordance with vendor procedure.

5. Changed cask limits to be in compliance with vendor changes.

6. Updated Form WM-PS-345-1.

PROCEDURE REVISION SUMMARY
WM-RP-009, Revision 3

1. Change equipment description to allow the use of equivalent explosive gas detection devices. This is a corrective action from AR 407300.

PROCEDURE REVISION SUMMARY
WM-RP-104

1. Clarify criteria for loss-of-suction when gross-dewatering. Original criteria were too proscriptive and did not apply to the intended purpose of this procedure. The change allows greater flexibility for determining when loss-of-suction has occurred without sacrificing any margin of safety related to meeting transportation requirements. See CRA 380089 (CR 379659).

2. Clarify when confirm and verify steps must be performed and provide for the ability to document waivers.

3. Add reference for CR 188042 and footnote steps required by the CR resolution in PCAF 2000-4807.

4. Various administrative changes to clarify language and intentions and remove redundant signature requirements.

PROCEDURE REVISION SUMMARY
WM-RP-107, Revision 6

1. Add requirements to connect fillhead flush line and flush fillhead after use in response to CR 338100. Flushing the fillhead is expected to reduce the possibility of area contamination due to residual waste material on the fillhead going airborne when the fillhead is removed.

2. Add reference to CR 338100.

3. Minor administrative corrections to procedure and Form WM-RP-107-1.

SECTION 6

MISCELLANEOUS TECHNICAL REQUIREMENTS MANUAL (TRM) FSAR AND 40CFR190 REPORTING

1. TRM Action 3.11.1.4.F.2 requires the reporting of Liquid Radwaste Effluent Monitoring Instrumentation inoperability not corrected in a timely.

   None to report for 2002.

2. TRM Action 3.11.1.5.C.1 requires the reporting of Radioactive Liquid Process Effluent Monitoring Instrumentation inoperability not corrected in a timely.

   None to report for 2002.

3. TRM Action 3.11.2.6.K requires an explanation for Radioactive Gaseous Effluent Monitoring Instrumentation required actions and completion times not met.

   None to report for 2002.

4. TRM Action 3.11.4.1.F.2 requires reporting the cause of the unavailability of milk or fresh leafy vegetables samples and identify the new locations for obtaining replacements.

   None to report for 2002.

5. TRM Action 3.11.4.2.A requires reporting when land use census identifies a new location which yields a calculated dose or dose commitment greater than the values currently being calculated in Requirement 3.11.2.3 (Gaseous Effluent Dose due to Iodine, Tritium, and Radionuclides in Particulate Form).

   None to report for 2002.

6. TRM Action 3.11.4.2.B requires reporting when land use census identifies locations that yields a calculated dose or dose commitment (via the same exposure pathway) 20 percent greater than at a location from which samples are currently being obtained in accordance with Requirement 3.11.4.1 (Radiological Environmental Monitoring Program).

   None to report for 2002. [Note: Milk sampling at the Berger farm (REMP monitoring location 12B2) began in the spring of 2002. Milk sampling at the Drasher farm (REMP monitoring location 10D3) was discontinued in July 2002 and replaced by the Berger farm. During the period of April through June 2002, duplicate milk sampling occurred at the Drasher and Berger farms. The Berger farm is closer to the SSES (1.7 miles) than the Drasher farm (3.5 miles).

7. The 40CFR190.10 standard for normal operation for the uranium fuel cycle including annual dose equivalent and total quantities of radioactive material limits were not exceeded by SSES operation. Refer to Page 4-2 for specific values.

8. FSAR Section 11.6.11 requires the reporting of airborne radioactivity detected in the Low Level Radwaste Holding Facility. None detected in 2002.

SECTION 7

CORRECTIONS TO DOSES REPORTED IN PREVIOUS SEMIANNUAL OR ANNUAL EFFLUENT AND WASTE DISPOSAL REPORT

CORRECTIONS TO DOSES REPORTED IN PREVIOUS SEMIANNUAL OR ANNUAL EFFLUENT AND WASTE DISPOSAL REPORTS

Gross Alpha was identified (above the minimum detectable concentration) in the fourth quarter of 2001 at the Unit 1 and Unit 2 Reactor Buildings as well as the Unit 2 Turbine Building vents. Outlined below is the total gross alpha released from the referenced gaseous effluent release points (based on fourth quarter vent flow data):

Release Point	uCi's Gross Alpha Released
Unit 1 Reactor Vent	2.05E00
Unit 2 Reactor Vent	1.70E00
Unit 2 Turbine Vent	5.05E00

Fe-55 was identified in the fourth quarter composite for liquid effluent releases in 2001. Based on the volume of liquid effluent released in the fourth quarter of 2001, the resultant additional dose due to the Fe-55 (based on total site release) is 1.06E-06 mrem total body dose and 6.44E-06 mrem organ dose. The above referenced additional dose is negligible based on the maximum organ/total body dose from liquid effluent of 3.16E-03 mrem reported in Section 4 of the 2001 Annual Effluent and Waste Disposal Report.

SECTION 8

EFFLUENT FROM SYSTEMS CLASSIFIED AS INSIGNIFICANT EFFLUENT PATHWAYS

EFFLUENT FROM SYSTEMS CLASSIFIED AS INSIGNIFICANT EFFLUENT PATHWAYS

Systems classified as Insignificant Effluent Pathways which had identified radioisotopes due to SSES operations are the following: evaporation from the Unit 1 and Unit 2 Condensate Storage Tanks (CST's), evaporation from the common Refueling Water Storage Tank (RWST) and from the Hydrogen Seal Oil and the Main Turbine and RFPT lubrication oil mist eliminators which vent to the turbine building roofs.

These pathways are not continuously monitored. The CSTs and RWST are sampled quarterly to determine the concentration of radionuclides present in these tanks. Airborne release to the environment from the tanks is estimated based on conservative estimates of the evaporation rates from each of the tanks using a modified method established within Chapter 7 of EPA AP-42. A conservative carry-over fraction of radionuclides from the water to the evaporated liquid is then assumed. Airborne release to the environment from the demisters conservatively assumes the maximum contamination of the oil by condensate (1000 ppm) as it passes through the turbines followed by immediate removal of 100% of the water by the oil mist eliminators. The annual release of tritium, iodines and particulates with half-lives greater than 8 days was calculated based on these conservative assumptions; the calculated releases are shown in Table 8-1. All nuclides are negligible compared to the airborne release shown in Tables 2-1 and 2-2 except for tritium. The maximum dose to the public from a release of 32.6 Ci of tritium is calculated to be 1.05E-1 mrem (child). This is a fraction of the maximum dose from airborne effluent reported in Section 4.

The CST analyses showed concentrations ranging from 2.84E-8 to 5.92E-08 μCi/ml of Xe-135 and one sample identified a concentration of 9.45E-09 μCi/ml of Kr-85m. This range of concentration of dissolved and entrained noble gas in water stored in tanks on site was less than 1% of the Technical Requirement limit of 2E-4 μCi/ml allowed in water that may be discharged to the environment.

TABLE 8-1

ANNUAL RELEASE FROM SYSTEMS CLASSIFIED AS INSIGNIFICANT EFFLUENT PATHWAYS

Nuclide	RWST (Ci)	U1-CST and Main Turbine/RFPT Lube Oil Systems (Ci)	U2-CST and Main Turbine/RFPT Lube Oil Systems (Ci)	Total (Ci)
H-3	5.96E-02	1.52E+01	1.73E+01	3.26E+01
Mn-54	1.49E-08	1.03E-07	7.57E-08	1.94E-07
Cr-51	2.98E-10	7.30E-07	1.21E-08	7.43E-07
Co-58	0	5.67E-09	0	5.67E-09
Co-60	2.90E-08	1.95E-07	1.50E-07	3.74E-07
Fe-59	5.44E-11	0	0	5.44E-11
Tc-99m	0	0	5.97E-10	5.97E-10
Cs-137	1.05E-09	4.47E-08	0	4.57E-08
Ce-141	0	2.11E-09	0	2.11E-09
Xe-135	0	1.67E-06	1.06E-05	1.23E-05
Kr-85m	0	5.86E-07	0	5.86E-07