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248 - 248 - ENVIRONMENTAL SAMPLE DIRECTOR

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UPDATES FOR HARD COPY MANUALS WILL BE DISTRIBUTED WITHIN 5 DAYS IN ACCORDANCE WITH DEPARTMENT PROCEDURES. PLEASE MAKE ALL CHANGES AND ACKNOWLEDGE COMPLETE IN YOUR NIMS INBOX UPON RECEIPT OF HARD COPY. FOR ELECTRONIC MANUAL USERS, ELECTRONICALLY REVIEW THE APPROPRIATE DOCUMENTS AND ACKNOWLEDGE COMPLETE IN YOUR NIMS INBOX.

A045

MET/VENT DATA ACQUISITION OPTIONS

The following are sources of meteorological and ventilation data at Susquehanna SES:

A. ACQUISITION OF MET/VENT DATA FROM THE PICSY TERMINAL

1. From the SSES LOGO display, select **E-PLAN MENU** or type **EPM** and **[ENTER]**.

2. All required meteorological and ventilation (MET/VENT) inputs for the MIDAS dose projections can be obtained by selecting the MET/VENT DATA display option on the E-PLAN menu.

   a. Vent and Primary Met Tower Data is displayed on page 1 of this display.

   b. Use the **PAGE FORWARD** command if the Back-up Tower data is required.

   c. Should neither the Primary or Back-up Tower be available, obtain the Downriver Tower data as follows:

      1) At the command line, type GD_VMS05B and [ENTER] for Downriver Tower wind speed.

      2) At the command line, type GD_VMX09B and [ENTER] for Downriver Tower wind direction.

      3) At the command line, type GD_VMX10B and [ENTER] for Downriver Tower sigma theta.

      4) Press Escape [ESC] to return to the SSES Logo display.

   d. Other options – see Step 6 below.

3. If the Primary Met Tower ΔT data is not available, determine the wind speed corrected stability class as follows:

   a. Determine the initial (uncorrected) stability class using the measured value of sigma theta and the Supplemental Meteorological Information Table 1 (or page 2 of the PICSY screen).

   b. Determine the wind speed corrected stability classification using the initial classification, the measured wind speed, and, as appropriate, either Table 2 or Table 3.

4. The PICSY QUALITY CODES for the display colors are as follows:

YELLOW:	**DATA ACCEPTABLE**
RED:	**DATA EXCEEDS WARNING LIMIT**
MAGENTA:	**DATA EXCEEDS ALARM SETPOINT**
WHITE:	**DATA SUSPECT**

5. If a hard copy printout of the information is required you may either:

   a. Select the PRINT option using the pull down menu (screen copy takes approximately 3 minutes to complete); or

   b. Initiate the MET/VENT DATA LOG option as follows:

      1) On the E-PLAN menu, select the FREE FORMAT LOG MENU.

      2) To activate the TSC log, press **[F1]**, **[22]**, and **[ENTER]**.

         To activate the EOF log, press **[F1]**, **[9]**, and **[ENTER]**.

      NOTE: Be sure to read the log description because there are 2 logs for the TSC and 2 logs for the EOF.

      3) The log will start printing at the next quarter hour.

      4) To deactivate the TSC log, press **[F3]**, **[22]**, and **[ENTER]**.

         To deactivate the EOF log, press **[F3]**, **[9]**, and **[ENTER]**.

6. If historical MET/VENT information is required, refer to the following instructions:

   a. At the command line, type: **GD_^METVENT1** and **[ENTER]**.

   b. Group point display for that display file will come up. Press the **[F3]** key for history. (See bottom of screen for F key menu.) A dialog box will appear.

   c. The work file name to be used is ARCHIVE.D, which is the default for that field.

   d. Enter the desired retrieval time. Click on OK.

   e. Group point display will return with values for the specified retrieval time.

   f. Press the **[F4]** key to step through data points from the specified retrieval time to the current time.

      NOTE: Not all desired data is likely to be available for any one particular point in time.

g. Press the **[F4]** key if you want to step slowly through the data. Press the **[F5]** key if you want to step quickly through the data. (See bottom of screen for F key menu for more options.)

h. The group point display will return to real time when history is complete. A message at the top of the screen will alert you that it is returning to real time.

6. To exit the menu, select the **[ESC]** key.

B. Site-specific meteorological information can be obtained by contacting either ABS Consulting or the National Weather Service (NWS).

1. ABS Consulting

ABS Consulting is the primary meteorological contractor for the Susquehanna Steam Electric Station (SSES). ABS Consulting has the ability to interrogate the primary and backup meteorological towers on a real-time basis and provide short and long-term weather forecasts for the site and surrounding area.

ABS Consulting provides this emergency service to PPL ONLY during normal working hours. The SSES Project Manager's name, phone number and mailing address are as follows:

ABS Consulting
Mark Abrams

(301) 907-9100
(301) 921-2362 (Fax)

ABS Consulting
Suite 200
4 Research Place
Rockville, MD 20850

2. NATIONAL WEATHER SERVICE

The National Weather Service's (NWS) primary meteorological support responsibility for a radiological emergency at SSES resides with the NWS office at Binghamton, New York. In the event the Binghamton office is unable to provide this support, the designated backup is the NWS office in State College, Pennsylvania.

The role of the local NWS office is to provide weather information and forecasts in support of emergency response activities at SSES. The NWS can be consulted over the telephone if data interpretations, assessment, or forecasting assistance are needed.

This information will include the following:

- Forecasts at current time and 6 hours of:
  a. 10-meter and 60-meter wind speed and wind direction,
  b. Precipitation rate in inches per 15 minutes, and,
  c. Boundary layer atmospheric stability described as **STABLE, UNSTABLE,** or **NEUTRAL.**
- Estimates of current 10-meter and 60-meter wind speed and wind direction in the event of complete loss of onsite and offsite meteorological instrumentation.
- General weather forecast from current time to 48 hours with special emphasis on significant weather occurrences such as major changes in wind speed, wind direction or synoptic weather patterns.
- Periodic weather updates at time intervals dictated by the on-going weather and emergency situation.

NOTE: **The NWS should ONLY be contacted when meteorological support from ABS Consulting is not available (i.e., weekends, holidays, and during the overnight hours).**

Whenever contacting the NWS, be sure to provide the following information:

- Name, Title, Facility, and Location
- Reason for the call
- Status of the Emergency
- Return telephone number

The following telephone numbers are UNLISTED and should only be used for EMERGENCY situations.

PRIMARY CONTACT NWS EMERGENCY METEOROLOGICAL SUPPORT OFFICE
National Weather Service Office Binghamton Regional Airport 32 Dawes Drive Johnson City, NY 13795 (607) 798-6625 (607) 729-7629 (607) 798-6624 (Fax)

BACKUP CONTACT NWS EMERGENCY METEOROLOGICAL SUPPORT OFFICE
National Weather Service Office 227 W. Beaver Avenue, Suite 402 State College, PA 16801 (814) 237-1152 (814) 237-1153 (814) 234-9703 (Fax)

PLANT COMPUTER METEOROLOGICAL DATA POINT IDENTIFIERS

METEOROLOGICAL PARAMETER	POINT ID*	UNITS	AVERAGING PERIOD
PRIMARY TOWER - east of the plant, 300' high red/white tower.			
10m Wind Direction	vma03	degrees	15 minutes
10m Wind Speed	vma06	mph	15 minutes
Delta T "A"	vma01	°C/50m	15 minutes
Delta T "B"	vma02	°C/50m	15 minutes
60m Wind Direction	vma04	degrees	15 minutes
60m Wind Speed	vma07	mph	15 minutes
10m Sigma Theta	vma10	degrees	15 minutes
60m Sigma Theta	vmx24	degrees	15 minutes
Precipitation Rate	vma09	in/hr	15 minutes
Ambient Temperature	vmt08b	°F	1 hour
BACKUP TOWER - across from the SSES Learning Center.			
10m Wind Direction	vma05	degrees	15 minutes
10m Wind Speed	vma08	mph	15 minutes
10m Sigma Theta	vma12	degrees	15 minutes
DOWNRIVER TOWER - on Route 93 just east of Nescopeck.			
10m Wind Direction	vmx09b	degrees	2 minutes**
10m Wind Speed	vms05b	mph	2 minutes**
10m Sigma Theta	vmx10b	degrees	2 minutes**

*** Letters are given here in lower case to differentiate the letter o from the number 0.**

SUPPLEMENTARY METEOROLOGICAL INFORMATION TABLES

TABLE 1

ATMOSPHERIC STABILITY CLASSIFICATION					
Stability Class		Delta Temperature (°C/50m)	(Alternate) Sigma Theta (degrees)	Plume Width @ 10 miles (miles)	% of Hrs at SSES
Code	Title				
A	Very Unstable	≤-.95	≥22.5	5.7	6
B	Unstable	-.94 to -.85	17.5 to 22.4	4.3	3
C	Slightly Unstable	-.84 to -.75	12.5 to 17.4	3.3	4
D	Neutral	-.74 to -.25	7.5 to 12.4	2.3	35
E	Slightly Stable	-.24 to .75	3.8 to 7.4	1.6	32
F	Stable	.76 to 2.0	2.1 to 3.7	1.1	12
G	Very Stable	>2.0	<2.1	.75	8

TABLE 2

DAYTIME
(08:00 to 18:00)

Initial Stability Class/ Wind Speed (MPH)	FINAL VALUE
A	
Wind Speed < 7	A
7 ≤Wind Speed < 9	B
9 ≤ Wind Speed < 13	C
Wind Speed ≥ 13	D
B	
Wind Speed < 9	B
9 ≤ Wind Speed < 13	C
Wind Speed ≥ 13	D
C	
Wind Speed < 13	C
Wind Speed ≥ 13	D
D, E, F, G	
Any wind speed.	D

Example: If wind speed is 9 mph and sigma theta is 18 degrees @ 10 a.m., the initial stability class from Table 1 is "B" and the wind speed corrected stability class from Table 2 is "C".

TABLE 3

NIGHTTIME
(18:00 to 08:00)

Initial Stability Class/ Wind Speed (MPH)	FINAL VALUE
A	
Wind Speed < 6	F
6 ≤ Wind Speed < 8	E
Wind Speed ≥ 8	D
B	
Wind Speed < 5	F
5 ≤ Wind Speed < 7	E
Wind Speed ≥ 7	D
C	
Wind Speed < 5	E
Wind Speed > 5	D
D	
Any wind speed.	D
E	
Wind Speed < 11	E
Wind Speed ≥ 11	D
F,G	
Wind Speed < 7	F
7 ≤ Wind Speed < 11	E
Wind Speed ≥ 11	D

TABLE 4

WIND SECTORS AND DISTANCES						
Wind From		Affected	Affected EPB*	On-Site Team	Site Boundary	% of Hrs Sector
Degrees	Sector	Sector	Distance (mi)	Distance (mi)	Distance (mi)	Affected SSES
348 - 11	N	S	0.34	0.25	0.38	6
12 - 33	NNE	SSW	0.34	0.37	0.39	9
34 - 56	NE	SW	0.34	0.33	0.61	12
57 - 78	ENE	WSW	0.34	0.39	1.22	11
79 - 101	E	W	0.34	0.37	1.03	6
102 - 123	ESE	WNW	0.34	0.41	0.61	4
124 - 146	SE	NW	0.34	0.35	0.66	4
147 - 168	SSE	NNW	0.34	0.29	0.59	4
169 - 191	S	N	0.34	0.29	0.59	5
192 - 213	SSW	NNE	0.34	0.39	0.78	7
214 - 236	SW	NE	0.34	0.42	0.58	11
237 - 258	WSW	ENE	0.34	0.52	0.49	7
259 - 281	W	E	0.34	0.45	0.48	4
282 - 303	WNW	ESE	0.34	0.18	0.50	3
304 - 326	NW	SE	0.34	0.20	0.43	3
326 - 348	NNW	SSE	0.34	0.20	0.41	5

* EPB distances established at Exclusion Area Boundary distance of 1800 ft.

COUNTY DECONTAMINATION FACILITY LOCATIONS

A. **Columbia County Decontamination Facility for Emergency Workers:**

Columbia Montour Area Vocational Technical School
5050 Sweppenheiser Drive
Bloomsburg, Pennsylvania

B. **Luzerne County Decontamination Facilities for Emergency Workers:**

Sweet Valley Volunteer Fire Company
5383 Main Road
Sweet Valley, Pennsylvania

Wright Township Volunteer Fire Company
477 South Main Street
Mountaintop, Pennsylvania

NOTE:

These locations are subject to change due to the dynamic nature of volunteer agencies. Confirmation regarding locations of County Decontamination Facilities may be obtained from the Columbia and Luzerne County Emergency Operations Centers.

LIQUID DISCHARGE DATA SHEETS

Section 1: Release Data

Time of release commencement into river (T_1) _____

Time of release termination (T_2) _____

Duration of release ($T_3 = T_2 - T_1$, expressed in hours) _____ Hours

Sample location(s) _____

NOTE: Complete PART I, II, or III based on location of sample.

Section 2: Determination of Radionuclides (from Part IV)

EC fraction for all radionuclides at Danville (S_d) _____

Section 3: Times of Arrival at Danville

	Transit Time to Danville (from Table 1)	Time of Arrival at Danville
Leading Edge	_____ hrs	_____
Peak Concentration	_____ hrs	_____
Trailing Edge	_____ hrs	_____

LIQUID DISCHARGE DATA SHEETS

PART I: **Complete this part if the results are for a sample obtained directly from the SSES Cooling Tower Blowdown Discharge (CTBD) line. Otherwise, proceed to Part II of this tab. Upon completion of Part I, proceed to Part IV.**

Radionuclides in Sample	Co-60	Sr-91	Mo-99	Te-132	I-131	I-133	I-134	I-135	Cs-134	Cs-136	Cs-137	Ba-139	Ba-140	Ba-141	Np-239
Radionuclide Activity Concentrations (C_i) of the Sample (µCi/ml)															
EC Values (L_i) for Radionuclides (µCi/ml)[1]	3E-6	2E-5	2E-5	9E-6	1E-6	7E-6	4E-4	3E-5	9E-7	6E-6	1E-6	2E-4	8E-6	3E-4	2E-5
EC Fractions (F_i) of Radionuclides[2]															

1 The EC (effluent concentration) values (L_i) are obtained from Table 2, Column 2 of Appendix B to 10CFR20. These EC values correspond to the PAG value (50 mrem CEDE) for river water at Danville.

2 Obtain the EC fractions (F_i) by dividing each radionuclide concentration (C_i) by its corresponding EC value (L_i) as follows: $F_i = C_i/L_i$. The EC fractions are those for the water entering the Susquehanna River from the SSES discharge.

LIQUID DISCHARGE DATA SHEETS

PART II: **Complete this part if the results are for a sample obtained from a waste stream entering directly into the SSES Cooling Tower Blowdown Discharge (CTBD) line. This includes results for a sample obtained from the SSES Spray Pond or from the SSES Liquid Radwaste System. Otherwise, proceed to Part III of this tab. Upon completion of Part II, proceed to Part IV.**

Flow Rate (F_1) of Waste Stream into the CTBD line (gpm)[1]	
Flow Rate (F_2) of CTBD line (gpm)[2]	
Dilution Factor (D_2) for the CTBD line[3]	

1 Obtain the flow rate (F_1) for the waste stream entering the CTBD line. If the waste stream is the SSES Spray Pond, its flow rate into the CTBD line may be determined as follows: a) Obtain the spray pond level from the Control Room, and b) Using the spray pond level, obtain the flow rate (F_1) for the spray pond from Table 2.

2 Obtain the flow rate (F_2) of the CTBD line from the TSC Chemistry Coordinator or TSC Coordinator, if possible. If the actual flow rate can't be obtained from the TSC Coordinator or TSC Chemistry Coordinator, assume that it is 5,000 gpm.

3 The dilution factor (D_2) for the CTBD line is obtained by dividing the sum of the waste stream and CTBD line flow rates (F_1+F_2) by the waste stream flow rate (F_1) as follows: $D_2 = (F_1+F_2)/F_1$.

LIQUID DISCHARGE DATA SHEETS

PART II (Continued)

Radionuclides in Sample	Co-60	Sr-91	Mo-99	Te-132	I-131	I-133	I-134	I-135	Cs-134	Cs-136	Cs-137	Ba-139	Ba-140	Ba-141	Np-239
Radionuclide Activity Concentrations (C_i) of the Sample (µCi/ml)															
Expected Radionuclide Activity Concentration (E_2) in the CTBD Line (µCi/ml)[4]															
EC Values (L_i) for Radionuclides (µCi/ml)[5]	3E-6	2E-5	2E-5	9E-6	1E-6	7E-6	4E-4	3E-5	9E-7	6E-6	1E-6	2E-4	8E-6	3E-4	2E-5
EC Fractions (F_i) of Radionuclides[6]															

4 Obtain the radionuclide concentrations expected (E_2) in the CTBD line by dividing the radionuclide concentrations (C_i) by the CTBD line dilution factor (D_2) as follows: $E_2 = C_i/D_2$.

5 The EC (effluent concentration) values (L_i) are obtained from Table 2, Column 2 of Appendix B to 10CFR20. These EC values correspond to the PAG value (50 mrem CEDE) for river water at Danville.

6 Obtain the EC fractions (F_i) by dividing each expected radionuclide concentration (E_2) by its corresponding EC value (L_i) as follows: $F_i = E_2/L_i$. The EC fractions are those for the water entering the Susquehanna River from the SSES discharge.

LIQUID DISCHARGE DATA SHEETS

PART III: Complete this part if the results are for a sample obtained from a waste stream entering into the Spray Pond before being released to the SSES Cooling Tower Blowdown Discharge (CTBD) line. Upon completion of Part III, proceed to Part IV.

Volume (V) of Release into the Spray Pond (gallons)[1]	
Dilution Factor (D_1) for the Spray Pond[2]	
Flow Rate (F_1) of Spray Pond into the CTBD line (gpm)[3]	
Flow Rate (F_2) of CTBD line (gpm)[4]	
Dilution Factor (D_2) for the CTBD line[5]	

1 Obtain the volume of the release to the Spray Pond from the TSC Chemistry Coordinator or TSC Coordinator.

2 Obtain the dilution factor (D_1) for the Spray Pond by dividing the volume (V) of the release into the Spray Pond by 2E7 as follows: $D_1 = V/2E7$.

3 Obtain the flow rate (F_1) from the SSES Spray Pond from Table 2. Spray Pond level can be obtained from the Control Room.

4 Obtain the flow rate (F_2) of the CTBD line from the TSC Chemistry Coordinator or TSC Coordinator, if possible. If the actual flow rate can't be obtained from the TSC Coordinator or TSC Chemistry Coordinator, assume that it is 5,000 gpm.

5 Obtain the dilution factor (D_2) for the CTBD line by dividing the sum of the Spray Pond (waste stream) and CTBD line flow rates (F_1+F_2) by the Spray Pond flow rate (F_1) as follows: $D_2 = (F_1 + F_2)/F_1$.

LIQUID DISCHARGE DATA SHEETS

PART III (Continued)

Radionuclides in Sample	Co-60	Sr-91	Mo-99	Te-132	I-131	I-133	I-134	I-135	Cs-134	Cs-136	Cs-137	Ba-139	Ba-140	Ba-141	Np-239
Radionuclide Activity Concentrations (C_i) of the Sample (µCi/ml)															
Expected Radionuclide Activity Concentration (E_1) in the Spray Pond (µCi/ml)[6]															
Expected Radionuclide Activity Concentration (E_2) in the CTBD Line (µCi/ml)[7]															
EC Values (L_i) for Radionuclides (µCi/ml)[8]	3E-6	2E-5	2E-5	9E-6	1E-6	7E-6	4E-4	3E-5	9E-7	6E-6	1E-6	2E-4	8E-6	3E-4	2E-5
EC Fractions (F_i) of Radionuclides[9]															

6 Obtain the radionuclide concentrations expected (E_1) in the Spray Pond by dividing the radionuclide concentrations (C_i) of the sample by the dilution factor (D_1) of the Spray Pond as follows: $E_1 = C_i/D_1$.

7 Obtain the radionuclide concentrations expected (E_2) in the CTBD line by dividing the radionuclide concentrations (E_1) by the CTBD line dilution factor (D_2) as follows: $E_2 = E_1/D_2$.

8 The EC (effluent concentration) values (L_i) are obtained from Table 2, Column 2 of Appendix B to 10CFR20. These EC values correspond to the PAG value (50 mrem CEDE) for river water at Danville.

9 Obtain the EC fractions (F_i) by dividing each expected radionuclide concentration (E_2) by its corresponding EC value (L_i) as follows: $F_i = E_2/L_i$. The EC fractions are those for the water entering the Susquehanna River from the SSES discharge.

LIQUID DISCHARGE DATA SHEETS

PART IV: Complete this part using the results obtained from either Parts I, II, or III, as applicable.

Undiluted Sum (S) of EC Fractions for all Radionuclides[1]	
River Depth (R_{CR}) Read at the Control Room – 0C653 or ENVR in PICSY[2]	
Dispersion Factor to Danville (M) from Table 1	
Diluted Sum (S_d) of EC Fractions for all Radionuclides at Danville[3,4]	

1 Obtain the undiluted sum (S) of EC fractions for all radionuclides by adding the EC fractions (F_i) for all radionuclides as follows: $S = \Sigma F_i$. Obtain the EC fractions from either Part I, II, or III, as appropriate.

2 If the river depth (R_{EL}) read at the SSES Environmental Lab is available, convert to the depth (R_{CR}) read at the Control Room as follows: $R_{CR} = 12 \times R_{EL} + 126$.

3 Obtain the diluted sum (S_d) of EC fractions by dividing the undiluted sum (S) of EC fractions by the dispersion factor (M) as follows: $S_d = S/M$.

4 The diluted sum of EC fractions is at Danville after dilution of the SSES effluent by the Susquehanna River *enroute*.

TABLE 1

SUSQUEHANNA RIVER:
DEPTH - DISPERSION FACTOR - TRANSIT TIME TO DANVILLE

RIVER DEPTH (in)*	DISPERSION AT DANVILLE (M)	TRANSIT TIME (hours)		
		Leading Edge	Peak Conc	Trailing Edge
144	136.4	68.7	74.3	141.2
150	155.5	64.8	70.3	136.5
156	179.2	61.1	66.5	131.9
162	208.3	57.2	62.3	127.2
168	281.3	45.9	52.4	112.9
174	250.6	35.5	41.2	99.7
180	261.5	34.5	40.0	95.6
186	277.8	33.0	38.3	90.2
192	297.3	31.4	36.4	84.0
198	323.6	29.5	34.3	76.7
204	366.7	26.9	31.3	66.7
210	456.6	23.0	27.2	52.7
216	588.2	20.0	24.0	40.8
222	869.6	16.5	20.5	27.5
228	980.4	15.3	19.3	24.3
234	1072	14.7	18.7	23.7
240	1174	14.2	18.2	23.0
246	1285	13.5	17.5	22.5
258	1567	12.2	16.2	21.0
270	2058	10.7	14.7	19.5
282	2597	10.0	14.0	18.7
294	3068	9.8	13.8	18.3
306	3559	9.8	13.8	18.0
318	4082	9.8	13.8	17.7
330	4651	9.7	13.7	17.2
342	5236	9.7	13.7	16.8
354	5882	9.7	13.7	16.3
366	6536	9.5	13.5	16.0
378	7246	9.5	13.5	15.5
390	8000	9.3	13.3	15.0

* **For depth readings found between depths stated above, round to closest figure. If value falls exactly between two depths reported above, round to the lesser value.**

TABLE 2

DISCHARGE FROM SPRAY POND TO COOLING TOWER BLOWDOWN LINE VS. SPRAY POND WATER SURFACE ELEVATION

SPRAY POND WATER SURFACE ELEVATION (feet above msl)	DISCHARGE RATE TO BLOWDOWN CONDUIT (l) (gpm)
678.5	0
.6	541
.7	1,530
.8	2,849
.9	4,445
679.0	6,213
.1	8,166
.2	10,271
.3	12,525
.4	14,804
.5	14,964
.6	15,123
.7	15,279
.8	15,434
.9	15,588
680.0	15,740
.1	15,891
.2	16,040
.3	16,188
.4	16,334
.5	16,480
.6	16,624
.7	16,766
.8	16,907
.9	17,048

SPRAY POND WATER SURFACE ELEVATION (feet above msl)	DISCHARGE RATE TO BLOWDOWN CONDUIT (l) (gpm)
681.0	17,187
.1	17,325
.2	17,462
.3	17,598
.4	17,733
.5	17,867
.6	18,000
.7	18,131
.8	18,262
.9	18,392
682.0	18,521
.1	18,649
.2	18,777
.3	18,903
.4	19,029
.5	19,154
.6	19,278
.7	19,401
.8	19,523
.9	19,645
683.0	19,766
.1	19,886
.2	20,005
.3	20,124
.4	20,242
.5	20,359