ATTACHMENT 17

Calculation QDC-0000-M-1408, "Atmospheric Dispersion Factors (X/Qs) for Accident Release," Revision 1

ATTACHMENT 1
Design Analysis Cover Sheet

Design Analysis (Major Revision)		Last Page No. [6] 15	
Analysis No.: [1]	QDC-0000-M-1408	Revision: [2]	1
Title: [3]	Atmospheric Dispersion Factors (X/Qs) for Accident Release		
EC/ECR No.: [4]	356379	Revision: [5]	0

		Component(s): [14]	
Station(s): [7]	Quad Cities		
Unit No.: [8]	00 (Common)		
Discipline: [9]	M		
Descrip. Code/Keyword: [10]	R00		
Safety/QA Class: [11]	S		
System Code: [12]	Varies		
Structure: [13]	N/A		

CONTROLLED DOCUMENT REFERENCES [15]

Document No.:	From/To	Document No.:	From/To
Drawing M-4	From		
Drawing M-8	From		
Drawing M-1555	From		

Is this Design Analysis Safeguards Information? [16] Yes ☐ No ☒ If yes, see SY-AA-101-106

Does this Design Analysis contain Unverified Assumptions? [17] Yes ☐ No ☒ If yes, ATI/AR#:

This Design Analysis SUPERCEDES: [18] QDC-0000-M-1068, QDC-0000-M-1069 In its entirety.

Description of Revision (list affected pages for partials): [19]

- Downwash incorporated into the ARCON96 model run for the Station Chimney to Control Room Intake Scenario.
- Terrain incorporated into the PAVAN model run for the Station Chimney to EAB scenario

Affected parts of the calculation include the calculation body and Attachments C, F, G, H, I and J. Attachments A, B, D, and E are unchanged.

Preparer: [20]	Traci Thomas (Print Name)	Traci Thomas (Sign Name)	8/11/05 (Date)
Method of Review: [21]	Detailed Review ☒	Alternate Calculations (attached) ☐	Testing ☐
Reviewer: [22]	Jack Robinson (Print Name)	Jack R Robinson (Sign Name)	8/12/05 (Date)
Review Notes: [23]	Independent review ☒	Peer review ☐	
(For External Analyses Only) External Approver: [24]	Harold Rothstein (Print Name)	Harold Rothstein (Sign Name)	8/12/05 (Date)
Exelon Reviewer: [25]	T.J. Mscisz (Print Name)	TJ Mscisz (Sign Name)	8/12/05 (Date)

Is a Supplemental Review Required? [26] Yes ☐ No ☒ If yes, complete Attachment 3

Exelon Approver: [27]	E. Flick (Print Name)	Elliott Flick (Sign Name)	8/13/05 (Date)

Exelon Nuclear

QDC-0000-M-1408 R1

OWNER'S ACCEPTANCE REVIEW CHECKLIST FOR EXTERNAL DESIGN ANALYSIS

	Yes	No	N/A
1. Do assumptions have sufficient rationale?	☑	☐	☐
2. Are assumptions compatible with the way the plant is operated and with the licensing basis?	☑	☐	☐
3. Do the design inputs have sufficient rationale?	☑	☐	☐
4. Are design inputs correct and reasonable?	☑	☐	☐
5. Are design inputs compatible with the way the plant is operated and with the licensing basis?	☑	☐	☐
6. Are Engineering Judgments clearly documented and justified?	☑	☐	☐
7. Are Engineering Judgments compatible with the way the plant is operated and with the licensing basis?	☑	☐	☐
8. Do the results and conclusions satisfy the purpose and objective of the design analysis?	☑	☐	☐
9. Are the results and conclusions compatible with the way the plant is operated and with the licensing basis?	☑	☐	☐
10. Does the design analysis include the applicable design basis documentation?	☑	☐	☐
11. Have any limitations on the use of the results been identified and transmitted to the appropriate organizations?	☑	☐	☐
12. Are there any unverified assumptions?	☐	☑	☐
13. Do all unverified assumptions have a tracking and closure mechanism in place?	☐	☐	☑
14. Have all affected design analyses been documented on the Affected Documents List (ADL) for the associated Configuration Change?	☑	☐	☐
15. Do the sources of input and analysis methodology used meet current technical requirement and regulatory commitments? (If the input sources or analysis methodology are based on an out-of-date methodology or code, additional reconciliation may be required if the site had committed to a more recent code)	☑	☐	☐
16. Have vendor supporting technical documents and references (including GE DRFs) been reviewed when necessary?	☑	☐	☐

EXELON REVIEWER: T.J. Mscisz DATE: 8/12/05

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1.0 PURPOSE/OBJECTIVE

This calculation, QDC-0000-M-1408, Rev. 1, presents the atmospheric relative concentration (X/Q) values for Alternative Source Term (AST) accident evaluations for the Quad Cities Station. The purpose of this calculation is to determine the Control Room, Exclusion Area Boundary (EAB), and the outer boundary of the Low Population Zone (LPZ) relative concentration values (X/Q, in sec/m^3) resulting from certain postulated accidental radiological releases. The values resulting from this calculation will serve as input to the calculation of the radiological doses using Alternative Source Terms (AST) per Regulatory Guide (RG) 1.183 (Reference 1).

The X/Q values resulting at the Control Room Intake are calculated using the NRC-sponsored computer codes ARCON96 (Reference 2) and PAVAN (Reference 3) consistent with the procedures in RG 1.194 (Reference 4). These analyses are presented in Section 2.0 (ARCON96) and in Section 3.0 (PAVAN).

The X/Q values resulting at the EAB and LPZ are calculated using the NRC-sponsored computer code PAVAN, consistent with the procedures in RG 1.145 (Reference 5). This analysis is presented in Section 3.0.

2.0 ARCON96 ANALYSIS OF CONTROL ROOM X/Q

ARCON96 is a commercial software package designated by Washington Group International (WGI) as NU-830, an "active" program applicable to nuclear safety related analyses as well as non-safety related studies and evaluations. Its use is principally control room habitability assessments. The NU-830 code has been verified for 0-2 hour, 2-8 hour, and 8-24 hour centerline and sector X/Q averages and the 95% maximum X/Q. This verification is in accordance with Revision 4 of the WGI Nuclear Engineering Standard for Computer Software Control, NEP-09. Revision 0 of NU-830 was verified for ground-level and zero exit velocity uncapped vents, and Revision 1 was verified for zero exit velocity stack releases.

2.1 Methodology and Acceptance Criteria

<u>ARCON96 Program Description</u> [excerpted from NUREG/CR-6331 Rev. 1]

ARCON96 is a straight line Gaussian dispersion model used in control room habitability assessments for estimating dispersion in the vicinity of buildings to calculate relative concentrations at control room air intakes that would be exceeded no more than five percent of the time. The basic diffusion model implemented in the ARCON96 code is a straight-line Gaussian model that assumes the release rate is constant for the entire period of release. This assumption is made to permit evaluation of potential effects of accidental releases without having to specify a complete release sequence. Ambient atmospheric conditions measured in accordance with RG 1.23 (Reference 6) are input to ARCON96 by way of a sequential hour-by-hour meteorological database of jointly measured wind speed, wind direction, and Pasquill stability class, as derived from the vertical temperature difference recorded at a representative location and elevation (i.e., tower level).

ARCON96 permits evaluation of ground-level, vent, and elevated releases. Building wake effects are considered in the evaluation of relative concentrations from ground-level releases. The proportion of the mixture is determined by the ratio between the effluent vertical velocity and the release-height wind speed using the procedure included in the NRC XOQDOQ code (Reference 7).

An elevated release, defined as a stack more than 2.5 times the height of structures in the immediate vicinity, is treated in the usual manner with correction for stack downwash and differences in terrain elevation between the stack and the control room intake. With an assumed zero (0) vertical exit velocity, vents are treated as ground-level releases. Otherwise, a vent release is treated as a mixed ground-level and elevated release.

Diffusion coefficients used in ARCON96 have three components. The first component is the diffusion coefficient used in other NRC models, for example XOQDOQ, and PAVAN. The other two components are corrections to account for enhanced dispersion under low wind speed conditions and in building wakes. Derivations of the low wind speed and building wake corrections are described by Ramsdell and Fosmire (Reference 8).

Parameter values for the correction factors are based on analysis of diffusion data collected in various building wake diffusion experiments. The experiments were conducted under a wide range of meteorological conditions. However, a large number of experiments were conducted during low wind speeds, when wake effects are minimal. The wake correction model included in ARCON96 treats diffusion under these conditions much better than previous models. Thus, the diffusion coefficients in ARCON96 account for both low-wind speed meander and wake effects.

ARCON96 calculates relative concentrations using hourly meteorological data. It then combines the hourly averages to estimate concentrations for periods ranging in duration from 2 hours to 30 days. Wind direction is considered as the averages are formed. As a result, the averages account for persistence in both diffusion conditions and wind direction. Cumulative frequency distributions are prepared from the average relative concentrations. Relative concentrations that are exceeded no more than five percent of the time (95th percentile relative concentrations) are determined from the cumulative frequency distributions for each averaging period. Finally, the relative concentrations for five standard averaging periods used in control room habitability assessments are calculated from the 95th percentile relative concentrations.

2.2 Design Input

2.2.1 Source/Control Room Intake Scenarios

There are four (4) release points identified for Quad Cities: the Unit 1 MSIV, the Unit 2 MSIV, the Station Chimney and the Reactor Building Vent Exhaust Stack. Both the Unit 1 and Unit 2 MSIV release heights are assumed to be 0 m above grade elevation since the releases actually occur below grade. The Station Chimney has a release height of 94.6 m and the Reactor Building Vent Exhaust Stack has a release height of 48.6 m (Reference 9). The Unit 1 MSIV, Unit 2 MSIV and the Reactor Building Vent Exhaust Stack are all less than 2.5 times the height of their adjacent buildings, and therefore per RG 1.194 they are modeled as "ground" level releases. Consistent with the original Quad Cities Station licensing as documented in the Quad Cities Safety Evaluation Report (SER), the Station Chimney (although somewhat less than 2.5 times the height of its adjacent buildings) is treated as an elevated release. The locations of the Unit 1 MSIV, Unit 2 MSIV, Reactor Building Vent Exhaust Stack and Station Chimney can be seen in Attachment A.

The Control Room Intake located 8.8 m above grade (Reference 10), is identified with respect to the MSIV, Vent Exhaust Stack and Station Chimney in Attachment A.

ARCON96 is executed for each of the following Source/Control Room Intake scenarios:

1) Unit 1 MSIV to Control Room Intake
2) Unit 2 MSIV to Control Room Intake

3) Station Chimney to Control Room Intake
4) Reactor Building Vent Exhaust Stack to Control Room Intake.

Per RG 1.194 Table A-2, the building area perpendicular to the wind direction should be utilized in ARCON96. Since both the Reactor Building and Turbine Building can potentially affect the flow from the Unit 1 MSIV, Unit 2 MSIV, and Reactor Building Vent Exhaust Stack to the Control Room Intake, both building's cross-sectional areas were separately modeled. For the Station Chimney scenario, the Turbine Building area was utilized. Calculations of these building areas are shown in Attachment B.

The source in all modeling scenarios is treated as a point source, but conservatively assumed to have a zero (0) vertical velocity, exhaust flow and stack radius. The ARCON96 input parameter values were set in accordance with RG 1.194, Table A-2 (e.g. surface roughness length = 0.2 m; wind direction window = 90 degrees, 45 degree on either side of line of sight from source to receptor; minimum wind speed = 0.5 m/s; and averaging sector width constant = 4.3).

The Station Chimney to Control Room Intake scenario was modeled in ARCON96 in Rev. 0 of this calculation without considering the effects of stack downwash (i.e. the vertical velocity, stack radius and stack flow were set to zero). In response to the NRC RAI dated July 22, 2005, additional ARCON96 model runs were completed with downwash incorporated by setting the vertical velocity (derived from the stack flow divided by the stack top internal area), stack radius (to the outside edge at the stack top) and stack flow (the design Standby Gas Treatment System flow) to 0.21 m/s, 1.86 m, and 1.89m^3/s, respectively, based on values indicated in the Quad Cities UFSAR.

Other parameters utilized by ARCON96 (i.e. wind direction, horizontal distance, etc.) are contained in Attachment C.

2.2.2 Meteorological Data

The Quad Cities meteorological tower data for the five-year period, 1995-1999, as supplied by Exelon (Reference 11), were applied in the ARCON96 modeling analyses. Wind measurements were taken at 33 ft, 196 ft, and 296 ft. The vertical temperature difference (i.e., delta T) was measured between 196 ft and 33 ft and between 296 ft and 33 ft. Wind speeds reported as "calm" were assigned a value of 0.5 mph (i.e. 0.22 m/s). As stated in Section 2.2.1, however, ARCON96 assigns a default value of 0.5 m/s to each wind speed lower than 0.5 m/s.

Executing ARCON96 requires the meteorological input file to contain two (2) wind levels (lower and upper) and one (1) delta T stability class. Since the Quad Cities X/Q analysis necessitates the modeling of both ground-level and elevated sources, two ARCON96 meteorological databases were developed from the three (3) levels of wind measurements (i.e. 33 ft, 196 ft, and 296 ft) and the two (2) sets of delta T measurements (i.e. 196-33 ft and 296-33 ft) as follows:

TABLE 2-1

Meteorological Database	Lower Level Wind	Upper Level Wind	Delta T Stability Class Levels
a	33 ft	196 ft	196-33 ft
b	33 ft	296 ft	296-33 ft

The most representative database was then selected to be utilized in ARCON96 for each of the source/Control Room Intake scenarios as shown below:

TABLE 2-2

Scenario	Meteorological Database*
Unit 1 MSIV	a
Unit 2 MSIV	a
Station Chimney	b
Reactor Building Vent Exhaust Stack	a

* Identified in Table 2-1.

Attachment D includes the five-year wind rose diagrams based on the lower, middle and upper level meteorological data.

Attachment E contains the joint wind direction, wind speed, and stability class distribution tables, based on both of the five-year meteorological databases shown in Table 2-1 of Section 2.2.1 (These data are provided both in the format of number of observations and percent occurrence frequency).

2.3 Calculations

The X/Q values resulting from the ARCON96 modeling analysis of each source/Control Room Intake scenario are presented in Table 2-3 below.

TABLE 2-3

ARCON96 Analysis X/Q Results
Control Room Intake

Scenario				X/Q (sec/m^3)*				
Receptor	Source	Building Area (m^2)	Downwash Included?	0-2 hours	2-8 hours	8-24 hours	1-4 days	4-30 days
Control Room Intake	Unit 1 MSIV	3355 (Reactor Building)	N/A	1.02E-03	8.23E-04	3.55E-04	2.32E-04	1.38E-04
		4046 (Turbine Building)	N/A	1.02E-03	8.23E-04	3.55E-04	2.32E-04	1.38E-04
	Unit 2 MSIV	2639 (Reactor Building)	N/A	3.88E-04	3.00E-04	1.24E-04	7.99E-05	4.87E-05
		3078 (Turbine Building)	N/A	3.88E-04	3.00E-04	1.24E-04	7.99E-05	4.87E-05
	Station Chimney	3000 (Turbine Building)	No	1.00E-13	1.00E-13	6.46E-11	1.70E-11	1.15E-11
		3000 (Turbine Building)	Yes	1.00E-11	1.16E-11	1.20E-09	2.99E-10	2.12E-10
	Reactor Building Vent Exhaust Stack	2696 (Reactor Building)	N/A	5.82E-04	4.43E-04	1.87E-04	1.10E-04	7.71E-05
		3153 (Turbine Building)	N/A	5.80E-04	4.42E-04	1.86E-04	1.10E-04	7.71E-05

*Shading indicates the maximum X/Q values.

As is clearly seen, the selection of either the Reactor Building or Turbine Building areas made virtually no difference in the X/Q values.

3.0 PAVAN ANALYSIS OF CONTROL ROOM, EAB and LPZ X/Q

The model PAVAN is a commercial software package designated by WGI as MC-131, an "active" program applicable to nuclear safety related analyses as well as non-safety related studies and evaluations. The PAVAN code Revision 1 verification was performed for the 0-2 hour, 0-8 hour, 8-24, 1-4 day, and 4-30 day 0.5-percentile, and annual average direction-specific X/Q values, and the overall site 95-percentile maximum X/Q for each of the 0-2 hour, 0-8 hour, 8-24 hour, 1-4 day, and 4-30 day time-averaging periods. This verification was performed with WGI (formerly Raytheon Engineers & Constructors, Inc.) corporate standards, and is consistent with Computer Software Control, NEP-09. Revision 1 of MC-131 was verified for ground-level (i.e., non-elevated) releases, as well as elevated releases, with zero (0) vertical exit velocity assumed.

While its use is principally for EAB and LPZ X/Q evaluations, PAVAN is also referenced for use in accordance with NRC RG 1.194 methodology for control room habitability assessments of elevated releases. In supplement to the use of ARCON96 for this purpose, NRC recommends that PAVAN also be executed, and its results incorporated into the determination of the 0-2 hour, and the 1-4 and 4-30 day X/Q time intervals. The maximum PAVAN X/Q at ground-level (excluding the "fumigation" condition) replaces the corresponding ARCON96 0-2 hour value if the PAVAN value is greater. For deriving the two longer interval X/Q values, the maximum PAVAN 1-4 day X/Q is added to the product of 23 times the maximum 1-4 day ARCON96 value, and then the total is divided by 24, resulting in the final X/Q value for the 1-4 day interval value; and similarly, the maximum PAVAN 4-30 day X/Q is added together with the product of 23 times the maximum 4-30 day ARCON96 value and then divided by 24 to obtain the X/Q value for the 4-30 day interval value.

3.1 Methodology and Acceptance Criteria

The computer code PAVAN is a straight line Gaussian dispersion model utilized to estimate relative ground-level air concentrations (X/Q) for potential accidental releases of radioactive material from nuclear facilities. Such assessment is required by 10 CFR 100 and 10 CFR 50. The program implements the NRC guidance provided in RG 1.145. The technical basis for the program is presented by Snell and Jubach (Reference 12). Utilizing joint frequency of occurrence distributions of wind direction, wind speed and Pasquill atmospheric stability class, PAVAN calculates X/Q values as a function of direction for various time-averaging periods at the EAB and the outer boundary of the LPZ. Calculations are made from assumed ground-level (i.e., non-elevated) releases (such as vents and building penetrations), which are less than 2.5 times the height of adjacent solid structures, and from elevated releases (i.e., stacks). Three (3) procedures are utilized for calculating X/Q: a direction-dependent approach, a direction-independent approach, and an overall site X/Q approach.

The PAVAN model contains certain model options for executing the program. Table 3-1 below summarizes the options invoked for the Control Room, EAB and LPZ X/Q calculations.

TABLE 3-1

Option No.	Description	Option Invoked?
1	Calculate σ_y and σ_z based on desert diffusion.	No
2	X/Q values include evaluation for no building wake.	No
3	ENVLOP calculations printed which describe upper envelope curve.	No
4	Print points used in upper envelope curve and calculation.	Yes
5	Null	---
6	Joint frequency distribution in % frequency format.	No
7	Print X/Q calculation details	Yes
8	Distribute calm winds observations into first wind speed category.	Yes
9	Use site-specific terrain adjustment factors for the annual average calculations.	Yes*
10	Assume a default terrain adjustment factor for the average annual calculations. Option 10 is applied, which together with application of Option 9 means that site specific terrain factors will be used.	Yes

* A uniform value of 1.0 is used.

3.2 Design Input

3.2.1 Source/Receptor Scenarios

3.2.1.1 Control Room Intake

For the Station Chimney to Control Room Intake scenario, PAVAN was executed in elevated release mode. The stack-to-intake horizontal distance is 127 m. The release height of the Station Chimney is 94.6 m, however, RG 1.194, Section 3.2.2 requires the release height to be measured from the height of the Control Room Intake (8.8 m above grade elevation); therefore, the actual Station Chimney release height of 94.6 m above grade was reduced by 8.8 m, to 85.8 m for modeling. Other PAVAN input parameter values included the Reactor Building height of 43.7 m (Reference 9) and the minimum Reactor Building vertical cross-sectional area of 1564 m^2.

Following the execution of PAVAN for the distance from the Station Chimney to the Control Room Intake, a review of this output was performed in accordance with RG 1.194 guidance to estimate an approximate distance range within which the actual maximum 0-2 hour X/Q would be predicted to occur in each given downwind sector. An additional set of PAVAN runs was then executed for several distances in this range. The distances modeled to determine the actual maximum X/Q are as follows: 75, 100, 127 (actual), 150, 200, 300, 350, 375, 400, 425, 450, 600, 800, 1000, 1500, 1800, 1900, 2000, 2200, 2500, and 3000 meters.

Terrain was not considered for the Station Chimney to Control Room Intake scenario because the distance from intake to source is so small that the terrain would not be expected to have a significant effect on the X/Q values.

3.2.1.2 EAB and LPZ

The PAVAN model was also executed to determine the ground-level X/Q for the following source/receptor scenarios:

1) Unit 1 and 2 MSIV to the EAB and LPZ
2) Station Chimney to the EAB and LPZ
3) Reactor Building Vent Exhaust Stack to the EAB and LPZ

The EAB and LPZ are located at 380 m and 4828 m, respectively. The MSIV release points and the Reactor Building Vent Exhaust Stack releases do not qualify as elevated releases per RG 1.145; therefore, they were executed by PAVAN as "ground" type releases requiring an assumption of a 10 m release height. The Station Chimney was executed as an elevated release with a height of 94.6 m. The Reactor Building height of 43.7 m and the minimum calculated Reactor Building vertical cross-sectional area of 1564 m^2 were assumed for all three scenarios.

For the Station Chimney to EAB scenario, terrain effects were not considered in Rev. 0 of this calculation; however, in response to the NRC RAI dated July 22, 2005, additional PAVAN model runs were completed to incorporate the terrain data shown below in Table 3-2 for EAB X/Q. This terrain height data was obtained from the topographic map shown in Attachment J. As noted in the Quad Cities Station UFSAR, "There are no topographic features which significantly affect the local meteorology".

TABLE 3-2
PAVAN Terrain Heights

Downwind Sector	S	SSW	SW	WSW	W	WNW	NW	NNW	N	NNE	NE	ENE	E	ESE	SE	SSE
Terrain Height (m)	17	5	0	0	0	0	2	3	3	3	3	5	5	5	5	17
Distance at which terrain height occurs (m)	530	380	380	380	380	380	380	380	380	380	380	380	380	380	380	740

3.2.2 Meteorological Data

The Quad Cities meteorological data from the five-year period, 1995-1999, as supplied by Exelon, were used in the PAVAN analysis. The format of PAVAN meteorological input consists of a joint wind direction (based on sixteen 22.5 degree sectors), wind speed (7 intervals), and stability class (7 classes) occurrence frequency distribution.

Each such meteorological joint frequency distribution for input to PAVAN was prepared from the two meteorological databases identified in Section 2.2.2, Table 2-1, by using the WGI pre-qualified program ARCONtoPAVANMETrev1 (Program Number NU-840) to transform the data to a joint wind-stability occurrence frequency distribution. The seven wind speed categories were defined according to RG 1.23 (Reference 6) with the first category identified as "calm". The minimum wind speed (i.e. wind threshold) was set to 0.75 mph and calm wind speeds were assigned a value of 0.5 mph. A midpoint was also assumed between each of the RG 1.23 wind speed categories, Nos. 2-6, as to be inclusive of all monitored wind speeds. The RG 1.23 wind speed categories have, therefore, been refined in Table 3-3 as follows:

TABLE 3-3

DEFINED WIND SPEED CATEGORY RANGES FOR PAVAN MODELING

Category No.	Regulatory Guide 1.23 Speed Interval (mph)	PAVAN-Assumed Speed Interval (mph)
1 (Calm)	0 to < 1	0 to<0.75
2	1 to 3	>=0.75 to <3.5
3	4 to 7	>=3.5 to <7.5
4	8 to 12	>=7.5 to <12.5
5	13 to 18	>=12.5 to <18.5
6	19 to 24	>=18.5 to <24
7	>24	>=24

The wind measurement level and delta T measurement layer selected as most representative of the release elevation assumed by PAVAN for each scenario are identified in Table 3-4. The joint wind-stability frequency distribution matrix input to each PAVAN modeling scenario was compiled from the data measured at the levels as indicated.

TABLE 3-4

Scenario	PAVAN Release Mode	Wind Level	Delta T Stability Class Layer
Station Chimney to Control Room Intake	Elevated	296 ft	296-33 ft
Unit 1 and 2 MSIV to EAB and LPZ	Ground (10 m)	33 ft	196-33 ft
Station Chimney to EAB and LPZ	Elevated	296 ft	296-33 ft
Reactor Building Vent Exhaust Stack to EAB and LPZ	Ground (10 m)	33 ft	196-33 ft

3.2 Calculations

The Quad Cities X/Q results are presented below in Table 3-5 for the Control Room Intake and in Table 3-6 for the EAB and LPZ.

TABLE 3-5

PAVAN Analysis X/Q Results Control Room Intake

Scenario	Horizontal Distance (m)	X/Q (sec/m^3)				
		0-2 hours	0-8 hours	8-24 hours	1-4 days	4-30 days
Station Chimney to CR Intake	75	5.77E-06	4.50E-08	3.97E-09	2.05E-11	1.07E-14
	100	5.77E-06	2.83E-07	6.27E-08	2.38E-09	2.17E-11
	127 (Actual Distance)	5.77E-06	6.17E-07	2.02E-07	1.79E-08	5.51E-10
	150	5.77E-06	9.79E-07	4.04E-07	5.90E-08	3.73E-09
	200	5.77E-06	1.75E-06	9.68E-07	2.66E-07	4.17E-08
	300	5.77E-06	2.54E-06	1.69E-06	6.94E-07	1.94E-07
	350	5.84E-06	2.68E-06	1.81E-06	7.77E-07	2.30E-07
	375	5.80E-06	2.69E-06	1.83E-06	7.93E-07	2.39E-07
	400	5.77E-06	2.69E-06	1.83E-06	8.00E-07	2.44E-07
	425	5.69E-06	2.66E-06	1.82E-06	8.00E-07	2.45E-07
	450	5.69E-06	2.67E-06	1.83E-06	8.02E-07	2.46E-07
	600	5.42E-06	2.54E-06	1.74E-06	7.66E-07	2.36E-07
	800	5.30E-06	2.46E-06	1.67E-06	7.26E-07	2.19E-07
	1000	4.86E-06	2.30E-06	1.58E-06	7.04E-07	2.20E-07
	1500	4.57E-06	2.26E-06	1.58E-06	7.36E-07	2.45E-07
	1800	4.53E-06	2.25E-06	1.59E-06	7.46E-07	2.52E-07
	1900	4.53E-06	2.26E-06	1.59E-06	7.47E-07	2.52E-07
	2000	4.40E-06	2.20E-06	1.56E-06	7.35E-07	2.50E-07
	2200	4.46E-06	2.22E-06	1.57E-06	7.37E-07	2.49E-07
	2500	4.40E-06	2.18E-06	1.54E-06	7.21E-07	2.42E-07
	3000	4.07E-06	2.02E-06	1.42E-06	6.66E-07	2.24E-07

TABLE 3-6

PAVAN Analysis X/Q Results EAB and LPZ

Scenario			X/Q (sec/m^3)					
Receptor	Source	X/Q Parameter	0-0.5 hour (max fumigation)	0-2 hours	0-8 hours	8-24 hours	1-4 days	4-30 days
EAB (380 m)	Unit 1 and 2 MSIV	Direction-Specific Max	N/A	1.36E-03 (W)	6.68E-04 (W)	4.69E-04 (W)	2.18E-04 (W)	7.22E-05 (W)
		Site Limit	N/A	8.57E-04	4.67E-04	3.44E-04	1.78E-04	6.91E-05
	Station Chimney	Direction-Specific Max	1.43E-04 (NNW)	4.50E-06 (E)	2.06E-06 (NNE)	1.40E-06 (NNE)	6.10E-07 (NNE)	1.85E-07 (NNE)
		Site Limit	N/A	4.73E-06	2.17E-06	1.47E-06	6.33E-07	1.88E-07
		Direction-Specific Max	1.57E-04 (S)	5.48E-06 (SSE)	2.39E-06 (SSE)	1.58E-06 (SSE)	6.60E-07 (SE)	1.99E-07 (SE)
		Site Limit	N/A	6.38E-06	2.82E-06	1.88E-06	7.77E-07	2.18E-07
	Reactor Building Vent Exhaust Stack	Direction-Specific Max	N/A	1.36E-03 (W)	6.68E-04 (W)	4.69E-04 (W)	2.18E-04 (W)	7.22E-05 (W)
		Site Limit	N/A	8.57E-04	4.67E-04	3.44E-04	1.78E-04	6.91E-05
LPZ (4828 m)	Unit 1 and 2 MSIV	Direction-Specific Max	N/A	1.04E-04 (W)	4.14E-05 (W)	2.62E-05 (W)	9.96E-06 (WNW)	2.52E-06 (WNW)
		Site Limit	N/A	5.32E-05	2.43E-05	1.65E-05	7.04E-06	2.08E-06
	Station Chimney	Direction-Specific Max	1.44E-05 (NNW)	2.42E-06 (W)	1.15E-06 (W)	7.89E-07 (W)	3.63E-07 (SE)	1.27E-07 (ESE)
		Site Limit	N/A	2.72E-06	1.32E-06	9.25E-07	4.24E-07	1.38E-07
	Reactor Building Vent Exhaust Stack	Direction-Specific Max	N/A	1.04E-04 (W)	4.14E-05 (W)	2.62E-05 (W)	9.96E-06 (WNW)	2.52E-06 (WNW)
		Site Limit	N/A	5.32E-05	2.43E-05	1.65E-05	7.04E-06	2.08E-06

1) N/A – Not Applicable
2) Shading and bolding indicates the higher of the Direction-Specific Max and Site Limit. For the Station Chimney to EAB scenario, shading and bolding also indicates the maximum of the PAVAN runs that incorporate terrain compared to those which do not.

4.0 SUMMARY AND CONCLUSIONS

The ARCON96 and PAVAN X/Q modeling calculation results are summarized below in Table 4-1 and in Attachment C for the regulated time-averaging periods. Control Room Intake results for the Station Chimney are calculated using the ARCON96 model, supplemented with PAVAN according to RG 1.194 methodology (described above in Section 3.0).

TABLE 4-1

X/Q Results Summary

Scenario		X/Q (sec/m^3)					
Receptor	Source	0-0.5 hour (max fumigation)	0-2 hours	2-8 hours*	8-24 hours	1-4 days	4-30 days
Control Room Intake	Unit 1 MSIV	N/A	1.02E-03	8.23E-04	3.55E-04	2.32E-04	1.38E-04
	Unit 2 MSIV	N/A	3.88E-04	3.00E-04	1.24E-04	7.99E-05	4.87E-05
	Station Chimney	N/A	5.84E-06	1.16E-11	1.20E-09	3.37E-08	1.07E-08
	Reactor Building Vent Exhaust Stack	N/A	5.82E-04	4.43E-04	1.87E-04	1.10E-04	7.71E-05
EAB (380 m)	Unit 1 and 2 MSIV	N/A	1.36E-03 (W)	6.68E-04 (W)	4.69E-04 (W)	2.18E-04 (W)	7.22E-05 (W)
	Station Chimney	1.57E-04 (S)	6.38E-06	2.82E-06	1.88E-06	7.77E-07	2.18E-07
	Reactor Building Vent Exhaust Stack	N/A	1.36E-03 (W)	6.68E-04 (W)	4.69E-04 (W)	2.18E-04 (W)	7.22E-05 (W)
LPZ (4828 m)	Unit 1 and 2 MSIV	N/A	1.04E-04 (W)	4.14E-05 (W)	2.62E-05 (W)	9.96E-06 (WNW)	2.52E-06 (WNW)
	Station Chimney	1.44E-05 (NNW)	2.72E-06	1.32E-06	9.25E-07	4.24E-07	1.38E-07
	Reactor Building Vent Exhaust Stack	N/A	1.04E-04 (W)	4.14E-05 (W)	2.62E-05 (W)	9.96E-06 (WNW)	2.52E-06 (WNW)

* Results for the EAB and LPZ represent a 0-8 hour time period as calculated by PAVAN.

All input and output files associated with the ARCON96 and PAVAN modeling results are provided in Attachments F and G, respectively (PAVAN output has been shortened to include only the input and X/Q summary). The corresponding WGI Computer Disclosure Sheets are contained in Attachments H and I.

5.0

REFERENCES

1) *Regulatory Guide 1.183, "Alternative Radiological Source Terms For Evaluating Design Basis Accidents At Nuclear Power Reactors"*; U.S. Nuclear Regulatory Commission; July 2000.

2) *Atmospheric Relative Concentrations in Building Wakes*; NUREG/CR-6331, PNNL-10521, Rev. 1; prepared by J. V. Ramsdell, Jr., C. A. Simmons, Pacific Northwest National Laboratory; prepared for U.S. Nuclear Regulatory Commission; May 1997 (Errata, July 1997).

3) *Atmospheric Dispersion Code System for Evaluating Accidental Radioactivity Releases from Nuclear Power Stations;* PAVAN, Version 2; Oak Ridge National Laboratory; U.S. Nuclear Regulatory Commission; December 1997.

4) *Regulatory Guide 1.194; Atmospheric Relative Concentrations for Control Room Radiological Habitability Assessments at Nuclear Power Plants*; U.S. Nuclear Regulatory Commission; June 2003.

5) *Regulatory Guide 1.145; Atmospheric Dispersion Models for Potential Accident Consequence Assessments at Nuclear Power Plants (Revison 1)*; U.S. Nuclear Regulatory Commission; November 1982.

6) *Regulatory Guide 1.23 (Safety Guide 23), Onsite Meteorological Programs*; U. S. Nuclear Regulatory Commission; USNRC Office of Standards Development; Washington, D.C.; 1972.

7) *XOQDOQ: Computer Program for the Meteorological Evaluation of Routine Releases at Nuclear Power Stations*; NUREG/CR-2919; J. F. Sagendorf, J. T. Goll, and W. F. Sandusky, U.S. Nuclear Regulatory Commission; Washington, D.C; 1982.

8) *Atmospheric Dispersion Estimates in the Vicinity of Buildings*; J. V. Ramsdell and C. J. Fosmire, Pacific Northwest Laboratory; 1995.

9) Quad Cites Drawing M-8, *General Arrangement Sections "A-A" & "B-B"*.

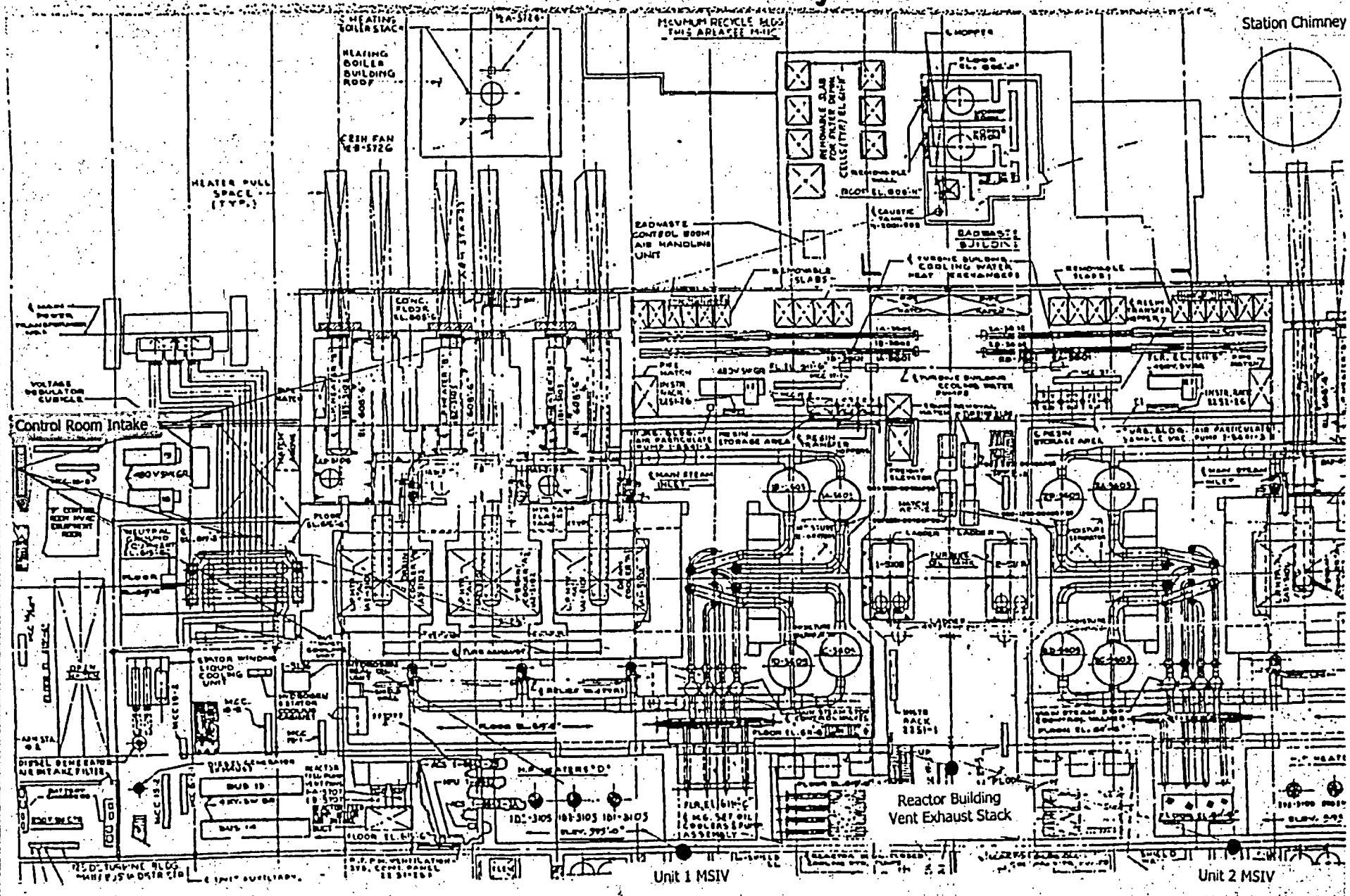
10) Quad Cities Drawing M-1555, *Control Room HVAC Equipment Room Turbine Building Plan EL 615'-6" & Service Building EL 609'-0" & 623'-0"*.

11) Quad Cities 1995-1999 Meteorological Tower Data; provided by Exelon via e-mail on 6/7/2004 from Tom Mscisz.

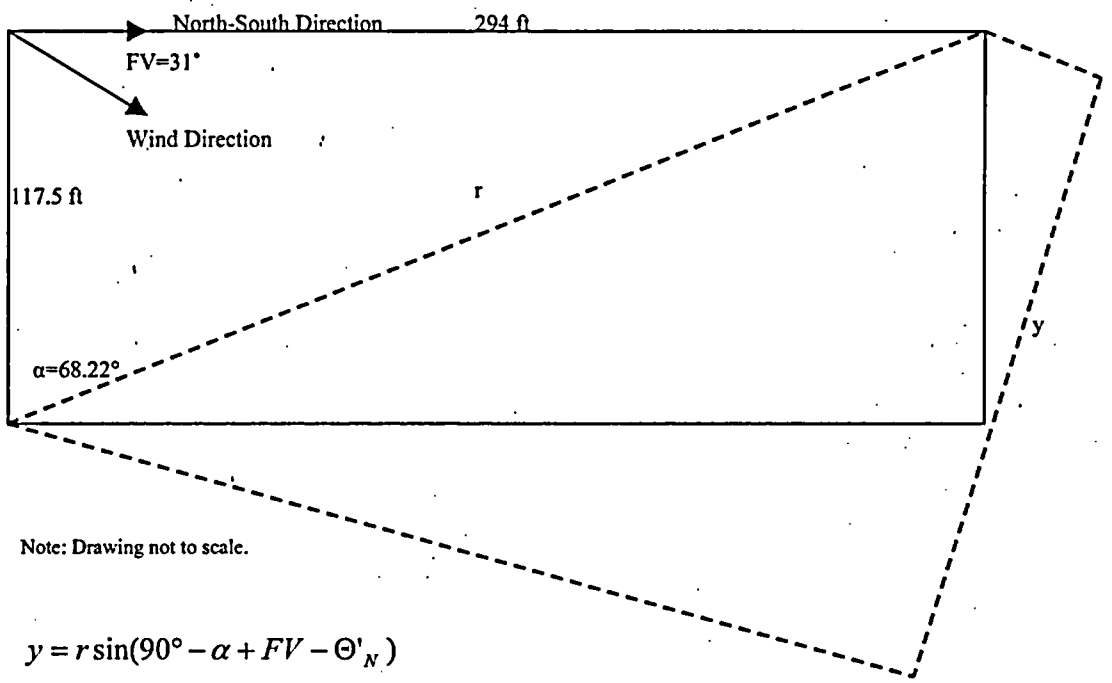
12) *Technical Basis for Regulatory Guide 1.145, Atmospheric Dispersion Models for Potential Accident Consequence Assessments at Nuclear Power Plants;* NUREG/CR-2260; W. G. Snell and R. W. Jubach, U.S. Nuclear Regulatory Commission, Washington, D.C; 1981.

Attachment A

(Excerpt of Drawing M-4)



Projected Area of the Reactor Building
Scenario: Unit 1 MSIV to Control Room Intake



Note: Drawing not to scale.

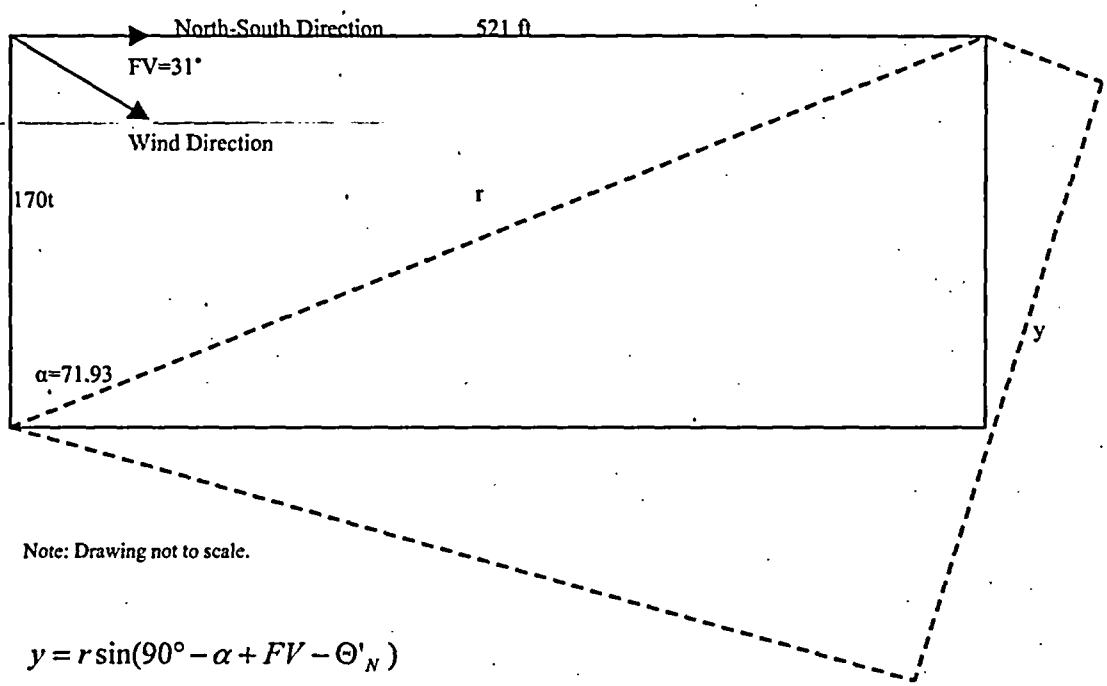
$$y = r\sin(90° - \alpha + FV - \Theta'_N)$$

- Reactor Building height = 143.25 ft (per Drawing M-8)
- Reactor Building width = 117.5(per Drawing M-4)
- Reactor Building length = 294 ft (per Drawing M-4)
- Wind direction = 31°
- $r = \sqrt{width^2 + length^2} = \sqrt{117.5^2 + 294^2} = 316.6 ft$
- $\sin\alpha = \left(\frac{length}{r}\right) = \left(\frac{294}{316.6}\right) = .9286 \quad \therefore \alpha = 68.22°$
- $FV = 31°$
- $\Theta'_N = 0°$

$$y = 316.6\sin(90° - 68.22 + 31° - 0°)$$
$$y = 316.6\sin(52.78)$$
$$y = 252.1 ft$$

Projected Area = (143.25)(252.1) = 36113.325 ft^2 = **3355.0 m^2**

Projected Area of the Turbine Building
Scenario: Unit 1 MSIV to Control Room Intake



Note: Drawing not to scale.

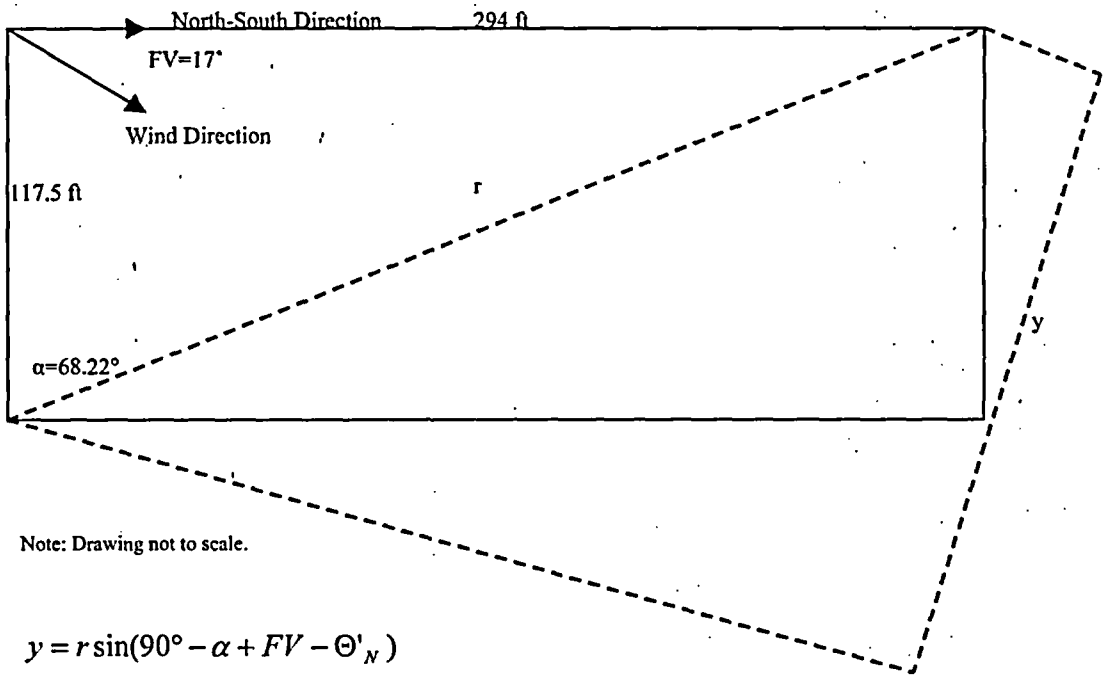
$$y = r\sin(90° - \alpha + FV - \Theta'_N)$$

- Turbine Building height = 105.2 ft (per Drawing M-8)
- Turbine Building width = 170.0(per Drawing M-8)
- Turbine Building length = 521 ft (per Drawing M-4)
- Wind direction = 31°
- $r = \sqrt{width^2 + length^2} = \sqrt{170^2 + 521^2} = 548\,ft$
- $\sin\alpha = \left(\frac{length}{r}\right) = \left(\frac{521}{548}\right) = .9507 \qquad \therefore \alpha = 71.93°$
- $FV = 31°$
- $\Theta'_N = 0°$

$$y = 548\sin(90° - 71.93 + 31° - 0°)$$
$$y = 548\sin(49.07)$$
$$y = 414.0\,ft$$

Projected Area = (105.2)(414) = 43552.8 ft^2 = 4046.2 m^2

Projected Area of the Reactor Building
Scenario: Unit 2 MSIV to Control Room Intake



Note: Drawing not to scale.

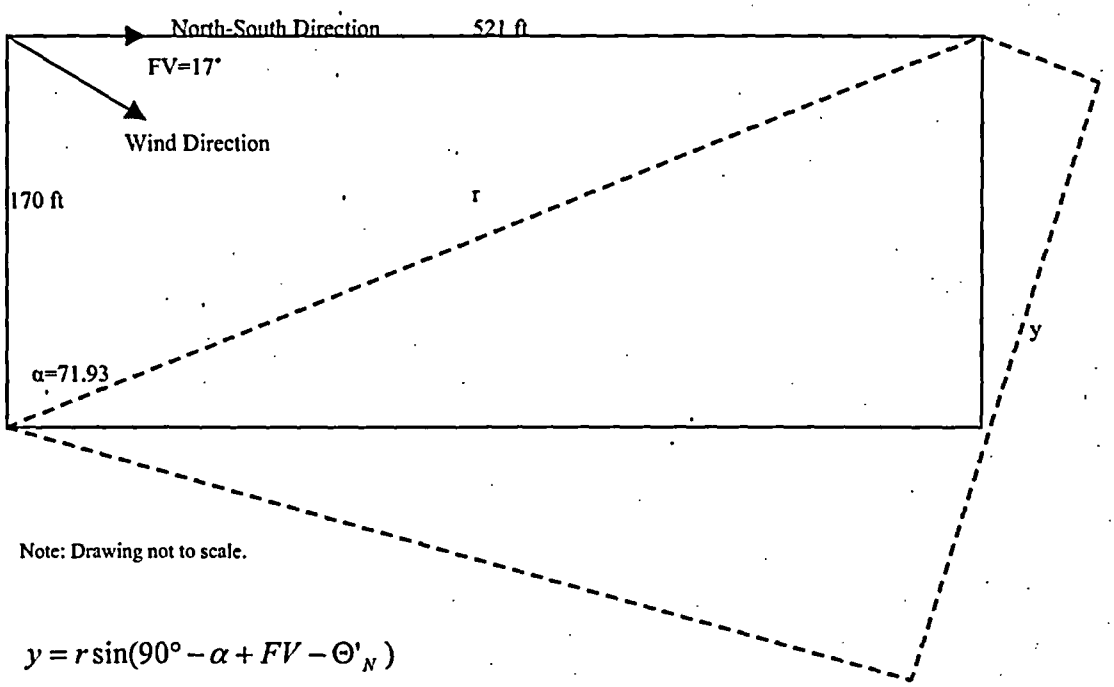
$$y = r\sin(90° - \alpha + FV - \Theta'_N)$$

- Reactor Building height = 143.25 ft (per Drawing M-8)
- Reactor Building width = 117.5(per Drawing M-4)
- Reactor Building length = 294 ft (per Drawing M-4)
- Wind direction = 17°
- $r = \sqrt{width^2 + length^2} = \sqrt{117.5^2 + 294^2} = 316.6\,ft$
- $\sin\alpha = \left(\frac{length}{r}\right) = \left(\frac{294}{316.6}\right) = .9286 \qquad \therefore \alpha = 68.22°$
-
- $FV = 17°$
- $\Theta'_N = 0°$

$$y = 316.6\sin(90° - 68.22 + 17° - 0°)$$
$$y = 316.6\sin(38.78)$$
$$y = 198.3\,ft$$

Projected Area = (143.25)(198.3) = 28406.475 ft^2 = **2639.0 m^2**

Projected Area of the Turbine Building
Scenario: Unit 2 MSIV to Control Room Intake



Note: Drawing not to scale.

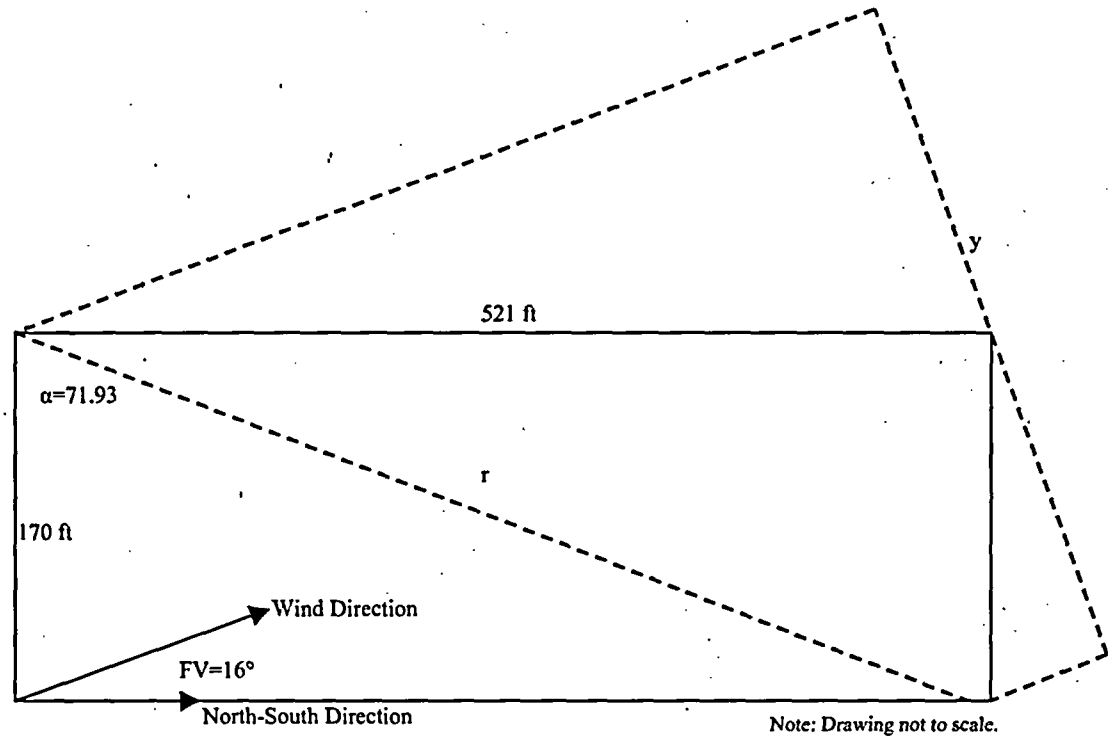
$$y = r\sin(90° - \alpha + FV - \Theta'_N)$$

- Turbine Building height = 105.2 ft (per Drawing M-8)
- Turbine Building width = 170.0(per Drawing M-8)
- Turbine Building length = 521 ft (per Drawing M-4)
- Wind direction = 17°
- $r = \sqrt{width^2 + length^2} = \sqrt{170^2 + 521^2} = 548\,ft$
- $\sin\alpha = \left(\frac{length}{r}\right) = \left(\frac{521}{548}\right) = .9507 \qquad \therefore \alpha = 71.93°$
- $FV = 17°$
- $\Theta'_N = 0°$

$$y = 548\sin(90° - 71.93 + 17° - 0°)$$
$$y = 548\sin(35.07)$$
$$y = 314.9\,ft$$

Projected Area = (105.2)(314.9) = 33127.48 ft^2 = 3077.6 m^2

Projected Area of the Turbine Building
Scenario: Station Chimney to Control Room Intake



$y = r\sin(90° - \alpha + FV - \Theta'_N)$

- Turbine Building height = 105.2 ft (per Drawing M-8)
- Turbine Building width = 170.0(per Drawing M-8)
- Turbine Building length = 521 ft (per Drawing M-4)
- Wind direction = 344°
- $r = \sqrt{width^2 + length^2} = \sqrt{170^2 + 521^2} = 548\,ft$
- $\sin\alpha = \left(\frac{length}{r}\right) = \left(\frac{521}{548}\right) = .9507 \qquad \therefore \alpha = 71.93°$
- $FV = 16°$
- $\Theta'_N = 0°$

$y = 548\sin(90° - 71.93 + 16° - 0°)$

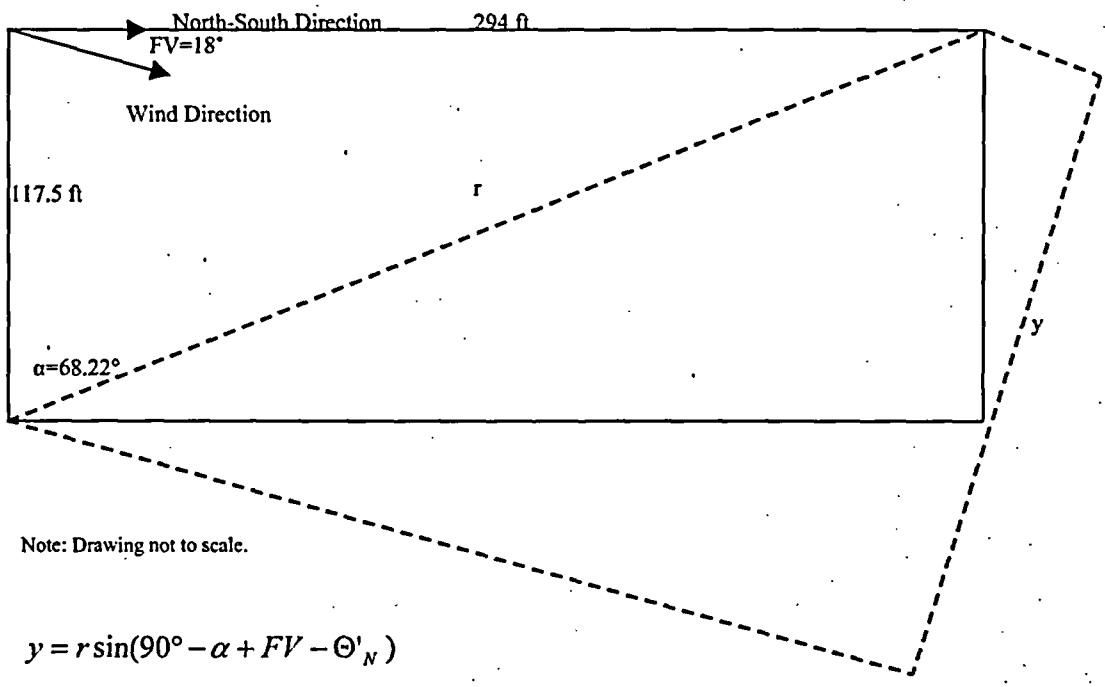
$y = 548\sin(34.07)$

$y = 307\,ft$

Projected Area = (105.2)(307) = 32296.4 ft^2 = 3000.4 m^2

Projected Area of the Reactor Building

Scenario: Unit 1 and 2 Reactor Building Vent Exhaust Stack to Control Room Intake



Note: Drawing not to scale.

$$y = r\sin(90° - \alpha + FV - \Theta'_N)$$

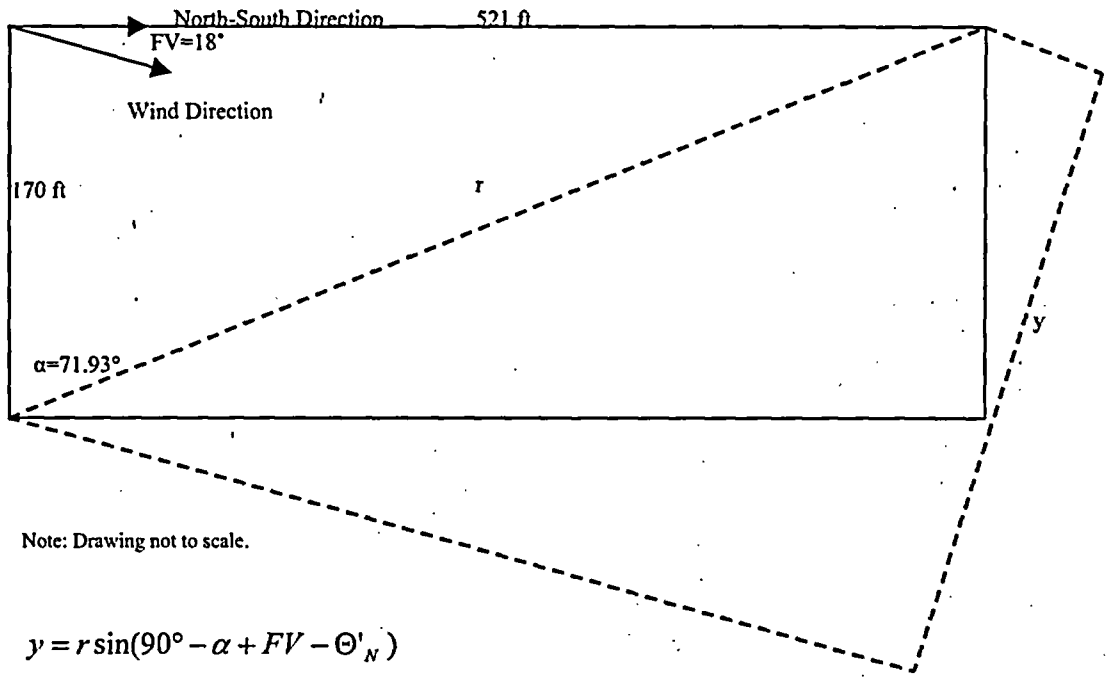
- Reactor Building height = 143.25 ft (per Drawing M-8)
- Reactor Building width = 117.5(per Drawing M-4)
- Reactor Building length = 294 ft (per Drawing M-4)
- Wind direction = 18°
- $r = \sqrt{width^2 + length^2} = \sqrt{117.5^2 + 294^2} = 316.6\,ft$
- $\sin\alpha = \left(\frac{length}{r}\right) = \left(\frac{294}{316.6}\right) = .9286 \qquad \therefore \alpha = 68.22°$
- $FV = 18°$
- $\Theta'_N = 0°$

$$y = 316.6\sin(90° - 68.22 + 18° - 0°)$$
$$y = 316.6\sin(39.78)$$
$$y = 202.6\,ft$$

Projected Area = (143.25)(202.6) = 29022.45 ft^2 = **2696.3 m^2**

Projected Area of the Turbine Building

Scenario: Unit 1 and 2 Reactor Building Vent Exhaust Stack to Control Room Intake



Note: Drawing not to scale.

$$y = r\sin(90° - \alpha + FV - \Theta'_N)$$

- Turbine Building height = 105.2 ft (per Drawing M-8)
- Turbine Building width = 170.0(per Drawing M-8)
- Turbine Building length = 521 ft (per Drawing M-4)
- Wind direction = 18°
- $r = \sqrt{width^2 + length^2} = \sqrt{170^2 + 521^2} = 548\,ft$
- $\sin\alpha = \left(\frac{length}{r}\right) = \left(\frac{521}{548}\right) = .9507 \qquad \therefore \alpha = 71.93°$
- $FV = 18°$
- $\Theta'_N = 0°$

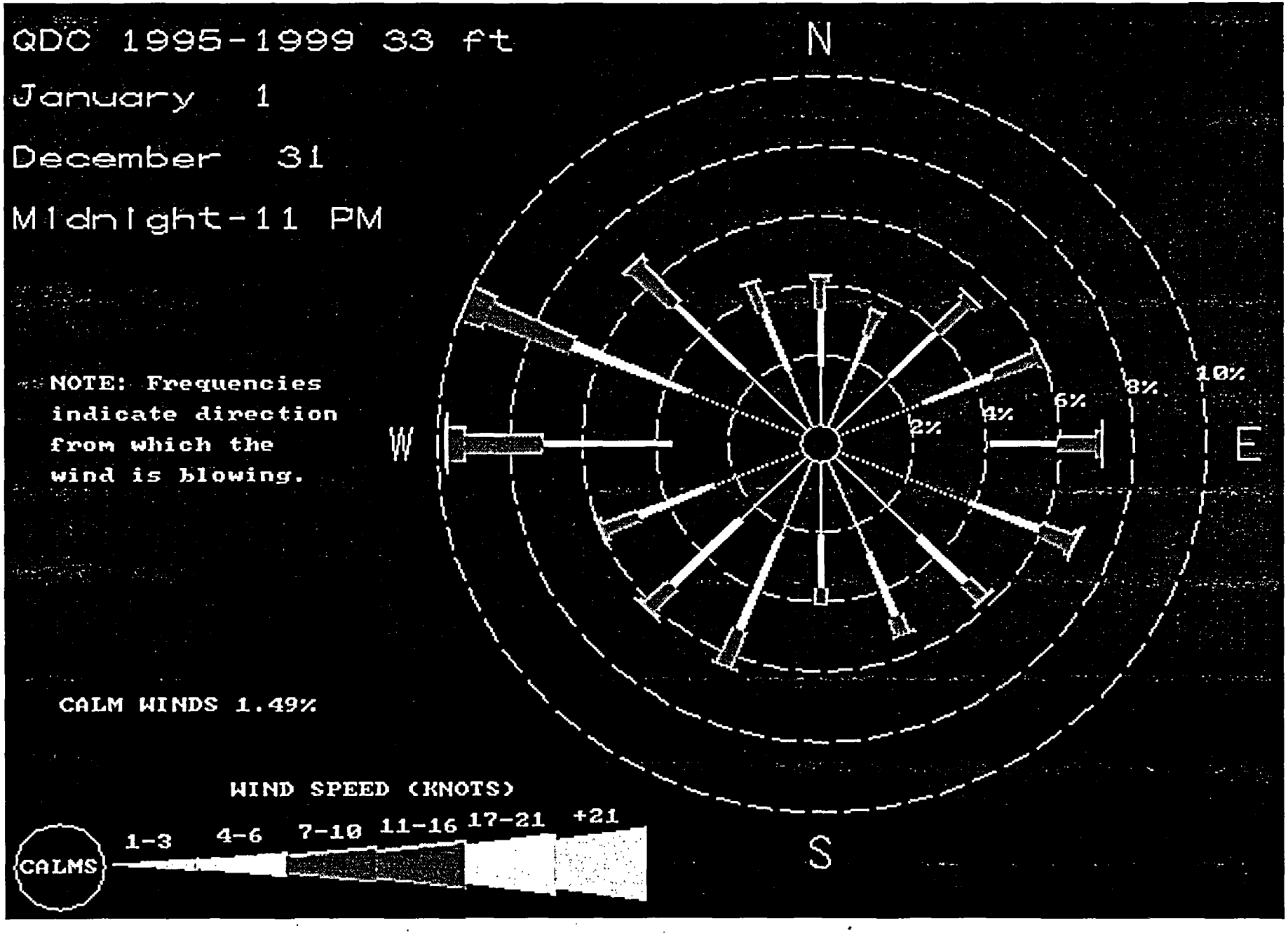
$$y = 548\sin(90° - 71.93 + 18° - 0°)$$
$$y = 548\sin(36.07)$$
$$y = 322.6\,ft$$

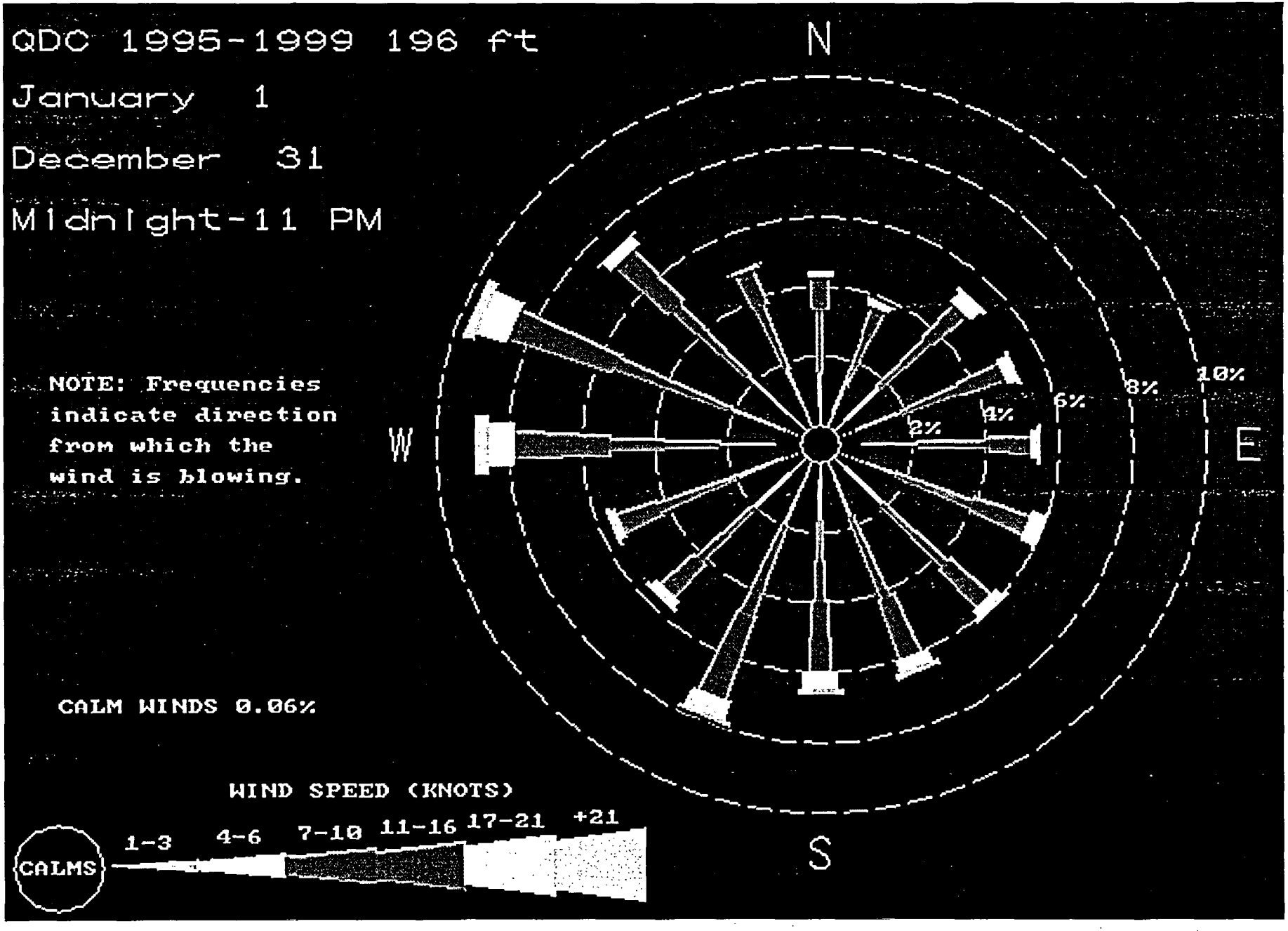
Projected Area = (105.2)(322.6) = 33937.52 ft^2 = 3152.9 m^2

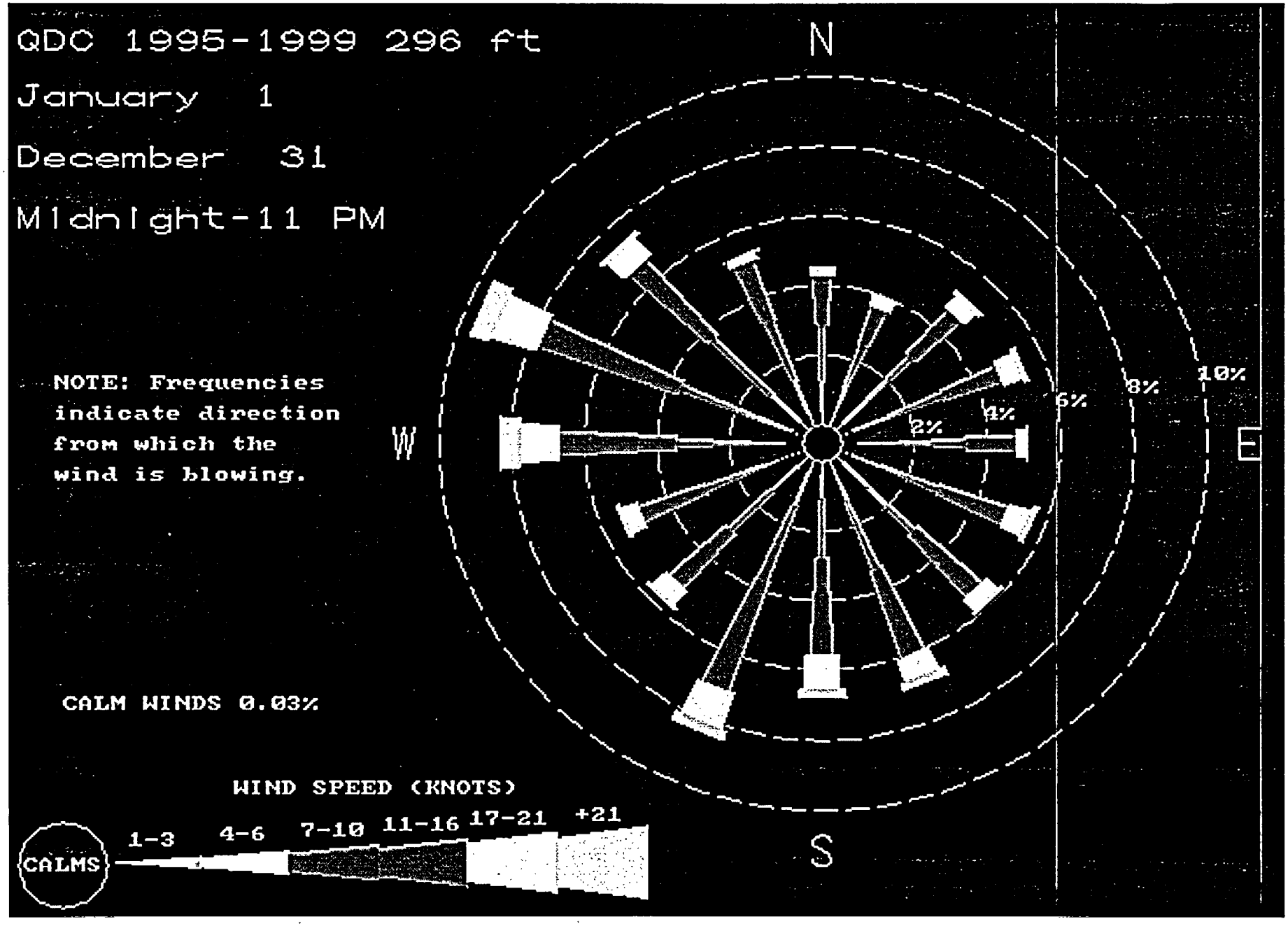
Quad Cities - Summary of Input Parameters and X/Q Values

	Source of Data	Model utilized	Release Point	Intake/Receptor	Used for DBA[1]	Horizontal Distance (m)	Direction from Intake to Source (°)	Release Height (m)	Intake Height (m)	Building Area (m²)	Vertical Velocity (m/s)	Stack Radius (m)	Stack Flow (m³/s)	X/Q (sec/m³) 0-8 5 hr (Fumigation)	0-2 hrs	2-8 hrs[2]	8-24 hrs	1-4 days	4-30 days	Notes
Revised X/Q calculated with corrected met data	WGI	ARCON96	Unit 1 MSIV	Control Room	LOCA, CRDA	72 9	31	0	6 8	Reactor Building 3365 0	0	0	0	N/A[3]	1 02E-03	8 73E-04	3 55E-04	2 32E-04	1 38E-04	Building area perpendicular to wind direction was used per RG 1.194, Table A-2
	WGI	ARCON96	Unit 2 MSIV	Control Room	LOCA, CRDA	121.5	17	0	6 8	Reactor Building 2638 0	0	0	0	N/A	3 86E-04	3 00E-04	1 24E-04	7 99E-05	4 87E-05	Building area perpendicular to wind direction was used per RG 1 194, Table A-2.
	WGI	ARCON96 and PAVAN	Station Chimney	Control Room	LOCA	127 1	344	94.6 (ARCON96); 85.8 (PAVAN)	6 8	Turbine Building 3000 4 (ARCON96); Reactor Building 1564 (PAVAN)	0	0	0	N/A	5 84E-06	1 00E-13	6 46E-11	3 34E-08	1 05E-08	Building area perpendicular to wind direction was used per RG 1.194, Table A-2. ARCON96 and PAVAN were used together to determine X/Q values according to RG 1 194, Section 3 2 2.
	WGI	ARCON96 and PAVAN	Station Chimney	Control Room	LOCA	127.1	344	94 6 (ARCON96); 85 8 (PAVAN)	6 8	Turbine Building 3000 4 (ARCON96); Reactor Building 1564 (PAVAN)	0 21	1 96	1 89	N/A	5 84E-06	1 16E-11	1.20E-09	3.37E-08	1 07E-08	Building area perpendicular to wind direction was used per RG 1 194, Table A-2. ARCON96 and PAVAN were used together to determine X/Q values according to RG 1 194, Section 3 2 2.
	WGI	ARCON96	Reactor Building Exhaust Stack	Control Room	FHA	94 8	16	46 6	6 8	Reactor Building 2098 3	0	0	0	N/A	6 87E-04	4 43E-04	1 67E-04	1 10E-04	7 71E-05	Building area perpendicular to wind direction was used per RG 1 194, Table A-2.
	WGI	PAVAN	Unit 1 and 2 MSIV	EAB	LOCA, CRDA	380	N/A	10	N/A	Reactor Building 1564	N/A	N/A	N/A	N/A	1 39E-03 (W)	6 88E-04 (W)	4 89E-04 (W)	2 18E-04 (W)	7.22E-05 (W)	PAVAN requires a ground-level release height of 10 m. The higher of the max sector X/Q (wind direction sector specified) and site limit X/Q (wind direction independent) value was selected
	WGI	PAVAN	Station Chimney	EAB	LOCA	380	N/A	94 8	N/A	Reactor Building 1564	N/A	N/A	N/A	1 43E-04 (NNW)	4 73E-06	2 17E-06	1 47E-06	6.33E-07	1 88E-07	The higher of the max sector X/Q (wind direction sector specified) and site limit X/Q (wind direction independent) value was selected. Terrain data not included
	WGI	PAVAN	Station Chimney	EAB	LOCA	380	N/A	94 6	N/A	Reactor Building 1564	N/A	N/A	N/A	1.57E-04 (S)	6.39E-06	2.82E-06	1 88E-06	7 77E-07	2.18E-07	The higher of the max sector X/Q (wind direction sector specified) and site limit X/Q (wind direction independent) value was selected. Terrain data included
	WGI	PAVAN	Reactor Building Exhaust Stack	EAB	FHA	380	N/A	10	N/A	Reactor Building 1564	N/A	N/A	N/A	N/A	1.39E-03 (W)	6 88E-04 (W)	4 89E-04 (W)	2 18E-04 (W)	7 22E-05 (W)	PAVAN requires a ground-level release height of 10 m. The higher of the max sector X/Q (wind direction sector specified) and site limit X/Q (wind direction independent) value was selected.
	WGI	PAVAN	Unit 1 and 2 MSIV	LPZ	LOCA, CRDA	4828	N/A	10	N/A	Reactor Building 1564	N/A	N/A	N/A	N/A	1 04E-04 (W)	4.14E-05 (W)	2 87E-05 (W)	9 98E-06 (WNW)	2 52E-06 (WNW)	PAVAN requires a ground-level release height of 10 m. The higher of the max sector X/Q (wind direction sector specified) and site limit X/Q (wind direction independent) value was selected.
	WGI	PAVAN	Station Chimney	LPZ	LOCA	4828	N/A	94 6	N/A	Reactor Building 1564	N/A	N/A	N/A	1 44E-06 (NNW)	2 72E-06	1 32E-06	9 25E-07	4 34E-07	1 38E-07	The higher of the max sector X/Q (wind direction sector specified) and site limit X/Q (wind direction independent) value was selected.
	WGI	PAVAN	Reactor Building Exhaust Stack	LPZ	FHA	4828	N/A	10	N/A	Reactor Building 1564	N/A	N/A	N/A	N/A	1 04E-04 (W)	4 14E-05 (W)	2 87E-05 (W)	9 98E-06 (WNW)	2 52E-06 (WNW)	PAVAN requires a ground-level release height of 10 m. The higher of the max sector X/Q (wind direction sector specified) and site limit X/Q (wind direction independent) value was selected.

Notes:
1) Design basis accident (DBA)
2) The PAVAN X/Q values are for 0-8 hours.
3) N/A = Not Applicable


QDC 1995-1999 33 ft
January 1
December 31
Midnight-11 PM
NOTE: Frequencies indicate direction from which the wind is blowing.
CALM WINDS 1.49%
N
W
E
S
2%
4%
6%
8%
10%
WIND SPEED (KNOTS)
CALMS
1-3
4-6
7-10
11-16
17-21
+21


QDC 1995-1999 196 ft
January 1
December 31
Midnight-11 PM
NOTE: Frequencies indicate direction from which the wind is blowing.
CALM WINDS 0.06%
N
W
E
S
2%
4%
6%
8%
10%
WIND SPEED (KNOTS)
CALMS
1-3
4-6
7-10
11-16
17-21
+21


QDC 1995-1999 296 ft
January 1
December 31
Midnight-11 PM
NOTE: Frequencies indicate direction from which the wind is blowing.
CALM WINDS 0.03%
N
S
W
E
2%
4%
6%
8%
10%
WIND SPEED (KNOTS)
CALMS
1-3
4-6
7-10
11-16
17-21
+21

Quad Cities

Joint Frequency Distribution
1995-1999
33 ft wind
196-33 ft Delta T

	Wind Speed Category[1]	Wind Direction Category																Total	Calms	Total
		N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW			
1 (A)	2	0	0	1	0	0	0	0	3	0	0	0	1	1	2	1	1	10		
	3	78	68	48	50	27	24	52	134	99	255	192	170	261	211	186	111	1966		
	4	71	63	72	47	26	67	63	95	70	158	111	55	204	226	237	156	1721		
	5	6	4	6	12	2	17	7	4	7	3	1	1	16	39	18	8	151		
	6	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	2		
	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3850
2 (B)	2	0	2	0	0	1	0	0	0	1	0	1	1	3	3	5	0	17		
	3	29	26	32	30	19	28	33	55	33	55	58	56	58	57	45	47	661		
	4	16	12	23	22	23	19	16	8	5	16	20	17	39	37	27	23	323		
	5	3	5	0	1	3	4	0	0	0	0	0	3	6	13	3	2	43		
	6	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1		
	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1045
3 (C)	2	1	2	3	6	6	7	1	2	5	7	10	11	14	12	6	4	97		
	3	63	60	62	52	54	75	78	108	64	142	154	116	125	122	112	69	1456		
	4	44	20	37	38	33	39	24	18	16	30	29	33	100	67	75	34	637		
	5	3	5	1	3	6	6	4	1	1	0	5	1	29	29	5	3	102		
	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2292
4 (D)	2	95	65	86	115	118	102	115	114	97	100	154	166	176	142	146	75	1866		
	3	409	293	460	561	586	449	416	405	272	365	485	454	754	889	687	367	7852		
	4	322	213	375	440	341	260	160	77	73	142	217	244	643	891	473	205	5076		
	5	61	50	84	87	35	66	27	13	2	7	17	33	170	229	83	17	981		
	6	1	0	1	2	1	2	0	0	0	1	16	10	11	7	0	0	52		
	7	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	2	0	15829
5 (E)	2	148	144	190	227	275	216	258	256	211	184	251	302	297	314	243	170	3686		
	3	325	167	324	398	373	429	411	381	394	498	665	471	654	560	552	368	6970		
	4	52	38	68	133	98	144	99	96	121	190	193	77	63	101	76	38	1587		
	5	1	1	6	7	11	18	10	9	7	3	7	1	4	5	3	2	95		
	6	0	0	0	0	1	3	0	0	0	0	0	0	0	0	0	0	4		
	7	0	0	0	0	0	3	0	0	0	0	0	0	1	0	0	0	4	0	12346
6 (F)	2	131	143	177	184	319	391	311	313	231	180	137	131	213	281	172	129	3443		
	3	23	21	40	48	69	201	132	103	79	94	40	14	49	38	38	25	1014		
	4	0	1	0	51	0	4	1	1	3	7	1	0	0	1	0	0	70		
	5	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1		
	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4528
7 (G)	2	72	101	108	155	480	552	278	198	129	85	77	81	128	181	78	67	2770		
	3	1	8	2	2	36	155	28	11	7	3	1	0	6	18	4	2	284		
	4	0	0	0	234	0	0	0	0	0	0	0	0	0	0	0	0	234		
	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3288
																				43178

Notes:
(1) Wind Speed Categories defined as follows:

Category	Wind Speed (mph)
2	>=0.75 to <3.5
3	>=3.5 to <7.5
4	>=7.5 to <12.5
5	>=12.5 to <18.5
6	>=18.5 to <24
7	>=24

Quad Cities

Joint Frequency Distribution
1995-1999
33 ft wind
196-33 ft Delta T

	Wind Speed Category[1]	Wind Direction Category 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	Total		
1 (A)	2	0	0	0.002316	0	0	0	0	0.006948	0	0	0	0.002316	0.002316	0.004632	0.002316	0.002316	0.02316		
	3	0.180647552	0.157488	0.111168	0.1158	0.062532	0.055584	0.120432	0.310343	0.229283	0.590579	0.444671	0.393719	0.604475	0.488675	0.430775	0.2570754	4.553245		
	4	0.164435592	0.145908	0.166752	0.108852	0.060216	0.155172	0.145908	0.220019	0.16212	0.365927	0.257075	0.12738	0.472463	0.523415	0.548891	0.3612951	3.985626		
	5	0.013895966	0.009264	0.013896	0.027792	0.004632	0.039372	0.016212	0.009264	0.016212	0.006948	0.002316	0.002316	0.037056	0.090324	0.041688	0.018528	0.349715		
	6	0	0	0	0.002316	0	0.002316	0	0	0	0	0	0	0	0	0	0	0.004632		
	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8.916578
2 (B)	2	0	0.004632	0	0	0.002316	0	0	0	0.002316	0	0.002316	0.002316	0.006948	0.006948	0.01158	0	0.039372		
	3	0.067163833	0.060216	0.074112	0.06948	0.044004	0.064848	0.076428	0.12738	0.076428	0.12738	0.134328	0.129696	0.134328	0.132012	0.10422	0.1088517	1.530872		
	4	0.037055908	0.027792	0.053268	0.050952	0.053268	0.044004	0.037056	0.018528	0.01158	0.037056	0.04632	0.039372	0.090324	0.085692	0.062532	0.0532679	0.748066		
	5	0.006947983	0.01158	0	0.002316	0.006948	0.009264	0	0	0	0	0	0.006948	0.013896	0.030108	0.006948	0.004632	0.099588		
	6	0	0	0	0.002316	0	0	0	0	0	0	0	0	0	0	0	0	0.002316		
	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2.420214
3 (C)	2	0.002315994	0.004632	0.006948	0.013896	0.013896	0.016212	0.002316	0.004632	0.01158	0.016212	0.02316	0.025476	0.032424	0.027792	0.013896	0.009264	0.224651		
	3	0.145907638	0.13896	0.143592	0.120432	0.125064	0.1737	0.180648	0.250127	0.148224	0.328871	0.356663	0.268655	0.289499	0.282551	0.259391	0.1598036	3.372088		
	4	0.101903747	0.04632	0.085692	0.088008	0.076428	0.090324	0.055584	0.041688	0.037056	0.06948	0.067164	0.076428	0.231599	0.155172	0.1737	0.0787438	1.475288		
	5	0.006947983	0.01158	0.002316	0.006948	0.013896	0.013896	0.009264	0.002316	0.002316	0	0.01158	0.002316	0.067164	0.067164	0.01158	0.006948	0.236231		
	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5.308259
4 (D)	2	0.220019454	0.15054	0.199176	0.266339	0.273287	0.236231	0.266339	0.264023	0.224651	0.231599	0.356663	0.384455	0.407615	0.328871	0.338135	0.1736996	4.321645		
	3	0.947241651	0.678586	1.065357	1.299273	1.357173	1.039881	0.963454	0.937978	0.62995	0.845338	1.123257	1.051461	1.74626	2.058919	1.591088	0.8499699	18.18519		
	4	0.745750151	0.493307	0.868498	1.019037	0.789754	0.602159	0.370559	0.178332	0.169068	0.328871	0.502571	0.565103	1.489184	2.063551	1.095465	0.4747788	11.75599		
	5	0.14127565	0.1158	0.194544	0.201492	0.08106	0.152856	0.062532	0.030108	0.004632	0.016212	0.039372	0.076428	0.393719	0.530363	0.192228	0.0393719	2.27199		
	6	0.002315994	0	0.002316	0.004632	0.002316	0.004632	0	0	0	0.002316	0.037056	0.02316	0.025476	0.016212	0	0	0.120432		
	7	0	0	0	0	0	0.002316	0	0	0	0	0	0.002316	0	0	0	0	0.004632	0	36.65987
5 (E)	2	0.34276715	0.333503	0.440039	0.525731	0.636898	0.500255	0.597527	0.592895	0.488675	0.426143	0.581315	0.69943	0.68785	0.727222	0.562787	0.393719	8.536755		
	3	0.752698133	0.386771	0.750382	0.921766	0.863866	0.993562	0.951874	0.882394	0.912502	1.153365	1.540136	1.090833	1.51466	1.296957	1.278429	0.8522859	16.14248		
	4	0.120431701	0.088008	0.157488	0.308027	0.226967	0.333503	0.229283	0.222335	0.280235	0.440039	0.446987	0.178332	0.145908	0.233915	0.176016	0.0880078	3.675483		
	5	0.002315994	0.002316	0.013896	0.016212	0.025476	0.041688	0.02316	0.020844	0.016212	0.006948	0.016212	0.002316	0.009264	0.01158	0.006948	0.004632	0.220019		
	6	0	0	0	0	0.002316	0.006948	0	0	0	0	0	0	0	0	0	0	0.009264		
	7	0	0	0	0	0	0.006948	0	0	0	0	0	0	0.002316	0	0	0	0.009264	0	28.59327
6 (F)	2	0.303395248	0.331187	0.409931	0.426143	0.738802	0.905554	0.720274	0.724906	0.534995	0.416879	0.317291	0.303395	0.493307	0.650794	0.398351	0.2987633	7.973968		
	3	0.053267868	0.048636	0.09264	0.111168	0.159804	0.465515	0.305711	0.238547	0.182964	0.217703	0.09264	0.032424	0.113484	0.088008	0.088008	0.0578999	2.348418		
	4	0	0.002316	0	0.118116	0	0.009264	0.002316	0.002316	0.006948	0.016212	0.002316	0	0	0.002316	0	0	0.16212		
	5	0	0	0	0	0	0.002316	0	0	0	0	0	0	0	0	0	0	0.002316		
	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10.48682
7 (G)	2	0.166751586	0.233915	0.250127	0.358979	1.111677	1.278429	0.643846	0.458567	0.298763	0.19686	0.178332	0.187596	0.296447	0.419195	0.180648	0.1551716	6.415304		
	3	0.002315994	0.018528	0.004632	0.004632	0.083376	0.358979	0.064848	0.025476	0.016212	0.006948	0.002316	0	0.013896	0.041688	0.009264	0.004632	0.657742		
	4	0	0	0	0.541943	0	0	0	0	0	0	0	0	0	0	0	0	0.541943		
	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7.614989
																		100		100

Notes:
(1) Wind Speed Categories defined as follows:

Category	Wind Speed (mph)
2	>=0.75 to <3.5
3	>=3.5 to <7.5
4	>=7.5 to <12.5
5	>=12.5 to <18.5
6	>=18.5 to <24
7	>=24

Quad Cities

Joint Frequency Distribution
1995-1999
196 ft wind
196-33 ft Delta T

	Wind Speed Category[1]	Wind Direction Category																			
		N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Total	Calms	Total
1 (A)	2	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1		
	3	18	20	15	18	9	8	8	15	13	30	39	45	72	76	58	47	491		
	4	81	93	73	48	27	37	56	90	67	215	103	118	217	154	200	136	1715		
	5	29	32	28	19	13	27	44	91	97	176	52	37	133	178	171	98	1225		
	6	11	4	9	13	3	19	11	22	42	48	11	2	35	78	39	1	348		
	7	0	0	0	2	0	7	2	6	24	17	0	0	3	8	2	2	73	0	3853
2 (B)	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1		
	3	17	15	12	19	6	9	11	10	13	28	17	20	28	27	22	23	277		
	4	16	24	26	17	17	25	20	43	22	41	14	36	37	31	36	28	433		
	5	11	5	16	11	10	11	11	11	12	17	12	8	26	28	26	17	232		
	6	2	5	1	2	5	3	4	5	3	11	0	4	12	17	5	4	83		
	7	0	0	0	1	0	2	0	2	0	1	0	0	3	5	1	1	16	0	1042
3 (C)	2	0	0	0	2	1	2	2	2	1	3	0	0	3	2	1	0	19		
	3	40	31	34	25	33	35	30	48	25	75	68	61	73	67	61	46	752		
	4	45	50	47	27	30	44	48	53	32	75	49	60	52	69	66	41	788		
	5	20	8	23	21	21	20	29	31	26	49	18	21	66	52	52	29	486		
	6	1	7	5	3	6	8	4	8	9	15	8	4	36	36	19	3	172		
	7	0	0	1	0	0	4	4	3	4	6	1	0	19	16	2	1	61	0	2278
4 (D)	2	37	23	39	30	50	29	36	33	36	26	38	52	50	47	38	22	586		
	3	163	129	189	226	263	220	205	182	148	183	224	199	239	212	274	179	3235		
	4	295	249	330	327	367	254	220	216	165	205	223	304	406	632	499	245	4937		
	5	239	189	296	334	270	206	193	138	160	216	179	210	542	794	502	225	4693		
	6	46	72	146	132	59	103	65	50	58	73	63	53	229	302	163	36	1650		
	7	16	14	26	26	8	30	16	27	19	20	29	19	136	151	39	4	580	0	15681
5 (E)	2	23	16	18	24	29	21	21	19	16	21	20	18	19	19	33	16	333		
	3	116	94	119	143	224	131	115	101	101	116	145	154	159	171	190	164	2243		
	4	321	190	263	288	304	337	264	273	252	319	410	399	459	547	476	356	5458		
	5	114	67	129	173	111	264	212	261	358	452	336	155	230	221	204	108	3395		
	6	7	6	24	31	18	76	54	80	154	197	63	18	23	17	15	5	788		
	7	0	0	0	6	5	21	12	32	39	25	5	2	4	3	3	0	157	0	12374
6 (F)	2	16	13	16	12	14	16	11	12	16	9	16	7	8	15	14	29	224		
	3	71	71	72	76	104	81	76	83	78	79	75	58	75	55	65	103	1222		
	4	64	92	117	105	110	201	249	254	275	256	120	74	96	123	104	104	2344		
	5	8	9	17	14	10	103	99	108	152	144	18	3	9	16	2	7	719		
	6	0	0	0	0	0	4	2	9	23	10	1	0	0	0	0	0	49		
	7	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	4559
7 (G)	2	29	35	27	27	20	18	18	16	28	25	36	23	32	20	24	14	392		
	3	42	51	62	56	77	69	118	113	117	96	99	58	63	43	38	47	1149		
	4	28	32	47	34	52	157	250	234	216	219	65	20	40	34	34	50	1512		
	5	4	2	5	0	2	47	74	37	46	27	4	0	1	3	0	0	252		
	6	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1		
	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3306
																				43093

Notes:
(1) Wind Speed Categories defined as follows:

Category	Wind Speed (mph)
2	>=0.75 to <3.5
3	>=3.5 to <7.5
4	>=7.5 to <12.5
5	>=12.5 to <18.5
6	>=18.5 to <24
7	>=24

Quad Cities

Joint Frequency Distribution
1995-1999
196 ft wind
196-33 ft Delta T

	Wind Speed Category[1]	Wind Direction Category 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	Total		
1 (A)	2	0	0	0	0	0	0	0	0.002321	0	0	0	0	0	0	0	0	0.002321		
	3	0.041770125	0.046411	0.034808	0.04177	0.020885	0.018565	0.018565	0.034808	0.030167	0.069617	0.090502	0.104425	0.167081	0.176363	0.134593	0.1090664	1.139396		
	4	0.187965563	0.215812	0.169401	0.111387	0.062655	0.085861	0.129952	0.208851	0.155478	0.498921	0.239018	0.273826	0.503562	0.357367	0.464113	0.3155965	3.979765		
	5	0.067296313	0.074258	0.064976	0.044091	0.030167	0.062655	0.102105	0.211171	0.225095	0.408419	0.120669	0.085861	0.308635	0.41306	0.396816	0.2274151	2.842689		
	6	0.025526188	0.009282	0.020885	0.030167	0.006962	0.044091	0.025526	0.051052	0.097464	0.111387	0.025526	0.004641	0.08122	0.181004	0.090502	0.0023206	0.807556		
	7	0	0	0	0.004641	0	0.016244	0.004641	0.013923	0.055694	0.03945	0	0	0.006962	0.018565	0.004641	0.0046411	0.169401	0	8.941127
2 (B)	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.002321	0	0.002321		
	3	0.039449563	0.034808	0.027847	0.044091	0.013923	0.020885	0.025526	0.023206	0.030167	0.064976	0.03945	0.046411	0.064976	0.062655	0.051052	0.0533729	0.642796		
	4	0.037129	0.055694	0.060335	0.03945	0.03945	0.058014	0.046411	0.099784	0.051052	0.095143	0.032488	0.08354	0.085861	0.071937	0.08354	0.0649758	1.004804		
	5	0.025526188	0.011603	0.037129	0.025526	0.023206	0.025526	0.025526	0.025526	0.027847	0.03945	0.027847	0.018565	0.060335	0.064976	0.060335	0.0394496	0.538371		
	6	0.004641125	0.011603	0.002321	0.004641	0.011603	0.006962	0.009282	0.011603	0.006962	0.025526	0	0.009282	0.027847	0.03945	0.011603	0.0092823	0.192607		
	7	0	0	0	0.002321	0	0.004641	0	0.004641	0	0.002321	0	0	0.006962	0.011603	0.002321	0.0023206	0.037129	0	2.418026
3 (C)	2	0	0	0	0.004641	0.002321	0.004641	0.004641	0.004641	0.002321	0.006962	0	0	0.006962	0.004641	0.002321	0	0.044091		
	3	0.0928225	0.071937	0.078899	0.058014	0.076579	0.08122	0.069617	0.111387	0.058014	0.174042	0.157798	0.141554	0.169401	0.155478	0.141554	0.1067459	1.745063		
	4	0.104425313	0.116028	0.109066	0.062655	0.069617	0.102105	0.111387	0.12299	0.074258	0.174042	0.113708	0.139234	0.120669	0.160119	0.153157	0.0951431	1.828603		
	5	0.04641125	0.018565	0.053373	0.048732	0.048732	0.046411	0.067296	0.071937	0.060335	0.113708	0.04177	0.048732	0.153157	0.120669	0.120669	0.0672963	1.127793		
	6	0.002320563	0.016244	0.011603	0.006962	0.013923	0.018565	0.009282	0.018565	0.020885	0.034808	0.018565	0.009282	0.08354	0.08354	0.044091	0.0069617	0.399137		
	7	0	0	0.002321	0	0	0.009282	0.009282	0.006962	0.009282	0.013923	0.002321	0	0.044091	0.037129	0.004641	0.0023206	0.141554	0	5.286241
4 (D)	2	0.085860813	0.053373	0.090502	0.069617	0.116028	0.067296	0.08354	0.076579	0.08354	0.060335	0.088181	0.120669	0.116028	0.109066	0.088181	0.0510524	1.35985		
	3	0.378251688	0.299353	0.438586	0.524447	0.610308	0.510524	0.475715	0.422342	0.343443	0.424663	0.519806	0.461792	0.554614	0.491959	0.635834	0.4153807	7.50702		
	4	0.684565939	0.57782	0.765786	0.758824	0.851646	0.589423	0.510524	0.501242	0.382893	0.475715	0.517485	0.705451	0.942148	1.466596	1.157961	0.5685378	11.45662		
	5	0.554614439	0.438586	0.686887	0.775068	0.626552	0.478036	0.447869	0.320238	0.37129	0.501242	0.415381	0.487318	1.257745	1.842527	1.164922	0.5221266	10.8904		
	6	0.106745875	0.167081	0.338802	0.306314	0.136913	0.239018	0.150837	0.116028	0.134593	0.169401	0.146195	0.12299	0.531409	0.70081	0.378252	0.0835403	3.828928		
	7	0.037129	0.032488	0.060335	0.060335	0.018565	0.069617	0.037129	0.062655	0.044091	0.046411	0.067296	0.044091	0.315597	0.350405	0.090502	0.0092823	1.345926	0	36.38874
5 (E)	2	0.053372938	0.037129	0.04177	0.055694	0.067296	0.048732	0.048732	0.044091	0.037129	0.048732	0.046411	0.04177	0.044091	0.044091	0.076579	0.037129	0.772747		
	3	0.269185251	0.218133	0.276147	0.33184	0.519806	0.303994	0.266865	0.234377	0.234377	0.269185	0.336482	0.357367	0.368969	0.396816	0.440907	0.3805723	5.205022		
	4	0.744900564	0.440907	0.610308	0.668322	0.705451	0.78203	0.612629	0.633514	0.584782	0.740259	0.951431	0.925904	1.065138	1.269348	1.104588	0.8261203	12.66563		
	5	0.264544125	0.155478	0.299353	0.401457	0.257582	0.612629	0.491959	0.605667	0.830761	1.048894	0.779709	0.359687	0.533729	0.512844	0.473395	0.2506208	7.87831		
	6	0.016243938	0.013923	0.055694	0.071937	0.04177	0.176363	0.12531	0.185645	0.357367	0.457151	0.146195	0.04177	0.053373	0.03945	0.034808	0.0116028	1.828603		
	7	0	0	0	0.013923	0.011603	0.048732	0.027847	0.074258	0.090502	0.058014	0.011603	0.004641	0.009282	0.006962	0.006962	0	0.364328	0	28.71464
6 (F)	2	0.037129	0.030167	0.037129	0.027847	0.032488	0.037129	0.025526	0.027847	0.037129	0.020885	0.037129	0.016244	0.018565	0.034808	0.032488	0.0672963	0.519806		
	3	0.164759938	0.16476	0.167081	0.176363	0.241339	0.187966	0.176363	0.192607	0.181004	0.183324	0.174042	0.134593	0.174042	0.127631	0.150837	0.2390179	2.835727		
	4	0.148516	0.213492	0.271506	0.243659	0.255262	0.466433	0.57782	0.589423	0.638155	0.594064	0.278468	0.171722	0.222774	0.285429	0.241339	0.2413385	5.439399		
	5	0.0185645	0.020885	0.03945	0.032488	0.023206	0.239018	0.229736	0.250621	0.352726	0.334161	0.04177	0.006962	0.020885	0.037129	0.004641	0.0162439	1.668484		
	6	0	0	0	0	0	0.009282	0.004641	0.020885	0.053373	0.023206	0.002321	0	0	0	0	0	0.113708		
	7	0	0	0	0	0	0.002321	0	0	0	0	0	0	0	0	0	0	0.002321	0	10.57944
7 (G)	2	0.067296313	0.08122	0.062655	0.062655	0.046411	0.04177	0.04177	0.037129	0.064976	0.058014	0.08354	0.053373	0.074258	0.046411	0.055694	0.0324879	0.909661		
	3	0.097463625	0.118349	0.143875	0.129952	0.178683	0.160119	0.273826	0.262224	0.271506	0.222774	0.229736	0.134593	0.146195	0.099784	0.088181	0.1090664	2.666326		
	4	0.06497575	0.074258	0.109066	0.078899	0.120669	0.364328	0.580141	0.543012	0.501242	0.508203	0.150837	0.046411	0.092823	0.078899	0.078899	0.1160281	3.508691		
	5	0.00928225	0.004641	0.011603	0	0.004641	0.109066	0.171722	0.085861	0.106746	0.062655	0.009282	0	0.002321	0.006962	0	0	0.584782		
	6	0	0	0	0	0	0	0	0	0	0.002321	0	0	0	0	0	0	0.002321		
	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7.67178
																		100		100

Notes:
(1) Wind Speed Categories defined as follows:

Category	Wind Speed (mph)
2	>=0.75 to <3.5
3	>=3.5 to <7.5
4	>=7.5 to <12.5
5	>=12.5 to <18.5
6	>=18.5 to <24
7	>=24

Quad Cities

Joint Frequency Distribution
1995-1999
33 ft wind
296-33 ft Delta T

	Wind Speed Category[1]	Wind Direction Category																Total	Calms	Total
		N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW			
1 (A)	2	0	0	0	0	0	0	0	0	1	0	0	2	0	5	0	0	8		
	3	32	31	24	28	13	7	33	75	56	138	101	92	122	98	85	55	990		
	4	32	40	45	19	9	26	35	62	41	99	48	22	58	109	131	85	881		
	5	0	2	5	5	0	1	5	3	0	1	0	0	6	11	11	4	54		
	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1913
2 (B)	2	1	1	0	0	1	3	0	1	2	5	6	12	12	10	6	2	62		
	3	67	60	63	50	37	48	61	107	62	149	144	116	132	108	106	48	1358		
	4	40	25	34	34	24	48	26	20	13	51	54	34	103	77	83	63	729		
	5	2	4	1	7	1	10	1	0	0	1	1	3	4	16	7	5	63		
	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2212
3 (C)	2	5	1	3	6	4	2	3	7	6	14	25	12	22	10	6	4	130		
	3	59	66	66	61	61	76	92	120	70	150	166	111	134	142	115	101	1590		
	4	51	19	47	48	38	35	36	18	17	45	59	48	123	101	96	53	834		
	5	8	5	0	3	6	13	0	0	1	1	3	2	19	26	6	4	97		
	6	0	0	0	2	0	0	0	0	0	0	0	0	0	1	0	0	3		
	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2654
4 (D)	2	119	90	113	140	151	119	135	138	114	110	170	179	187	157	181	104	2207		
	3	526	346	534	663	665	493	461	459	345	448	569	567	898	1055	838	472	9339		
	4	360	247	408	490	371	327	203	123	124	186	282	274	735	1006	558	246	5940		
	5	56	50	89	87	37	74	31	13	8	8	21	34	195	262	87	18	1070		
	6	1	0	1	2	0	5	0	0	0	1	16	10	11	6	0	0	53		
	7	0	0	0	0	0	3	0	0	0	0	0	1	1	0	0	0	5	0	18614
5 (E)	2	168	174	240	274	315	287	329	355	285	221	240	293	301	299	241	182	4204		
	3	233	124	257	307	291	428	396	388	381	490	587	385	559	423	446	292	5987		
	4	22	13	33	82	62	89	61	72	94	160	128	50	29	29	20	9	953		
	5	0	0	1	1	2	7	10	11	8	2	5	0	1	0	1	1	50		
	6	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	2		
	7	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	11197
6 (F)	2	129	138	159	184	417	488	353	291	209	164	145	144	224	320	181	121	3667		
	3	9	12	21	28	82	230	98	48	32	37	34	10	66	55	31	20	813		
	4	0	0	0	108	0	1	0	0	0	1	0	0	0	1	0	0	111		
	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4591
7 (G)	2	24	53	50	83	310	369	143	94	57	42	45	51	88	134	36	33	1612		
	3	1	4	1	1	16	78	6	0	1	0	1	0	7	16	3	1	136		
	4	0	0	0	161	0	0	0	0	0	0	0	0	0	0	0	0	161		
	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1909
																				43090

Notes:
(1) Wind Speed Categories defined as follows:

Category	Wind Speed (mph)
2	>=0.75 to <3.5
3	>=3.5 to <7.5
4	>=7.5 to <12.5
5	>=12.5 to <18.5
6	>=18.5 to <24
7	>=24

Quad Cities

Joint Frequency Distribution
1995-1999
33 ft wind
296-33 ft Delta T

	Wind Speed Category[1]	Wind Direction Category 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	Total		
1 (A)	2	0	0	0	0	0	0	0	0	0.002321	0	0	0.004641	0	0.011604	0	0	0.018566		
	3	0.07426317	0.071942	0.055697	0.06498	0.0301694	0.016245	0.076584	0.174054	0.129961	0.32026	0.234393	0.213507	0.283128	0.227431	0.197262	0.1276398	2.297517		
	4	0.07426317	0.092829	0.104433	0.044094	0.0208865	0.060339	0.081225	0.143885	0.09515	0.229752	0.111395	0.051056	0.134602	0.252959	0.304015	0.1972615	1.998143		
	5	0	0.004641	0.011604	0.011604	0	0.002321	0.011604	0.006962	0	0.002321	0	0	0.013924	0.025528	0.025528	0.0092829	0.125319		
	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4.439545
2 (B)	2	0.002320724	0.002321	0	0	0.0023207	0.006962	0	0.002321	0.004641	0.011604	0.013924	0.027849	0.027849	0.023207	0.013924	0.0046414	0.143885		
	3	0.155488512	0.139243	0.146206	0.116036	0.0858668	0.111395	0.141564	0.248317	0.143885	0.345788	0.334184	0.269204	0.306336	0.250638	0.245997	0.1113948	3.151543		
	4	0.092828963	0.058018	0.078905	0.078905	0.0556974	0.111395	0.060339	0.046414	0.030169	0.118357	0.125319	0.078905	0.239035	0.178696	0.19262	0.1462056	1.691808		
	5	0.004641448	0.009283	0.002321	0.016245	0.0023207	0.023207	0.002321	0	0	0.002321	0.002321	0.006962	0.009283	0.037132	0.016245	0.0116036	0.146206		
	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5.133442
3 (C)	2	0.01160362	0.002321	0.006962	0.013924	0.0092829	0.004641	0.006962	0.016245	0.013924	0.03249	0.058018	0.027849	0.051056	0.023207	0.013924	0.0092829	0.301694		
	3	0.13692272	0.153168	0.153168	0.141564	0.1415642	0.176375	0.213507	0.278487	0.162451	0.348109	0.38524	0.2576	0.310977	0.329543	0.266883	0.2343931	3.689951		
	4	0.118356927	0.044094	0.109074	0.111395	0.0881875	0.081225	0.083546	0.041773	0.039452	0.104433	0.136923	0.111395	0.285449	0.234393	0.22279	0.1229984	1.935484		
	5	0.018565793	0.011604	0	0.006962	0.0139243	0.030169	0	0	0.002321	0.002321	0.006962	0.004641	0.044094	0.060339	0.013924	0.0092829	0.22511		
	6	0	0	0	0.004641	0	0	0	0	0	0	0	0	0	0.002321	0	0	0.006962		
	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6.159202
4 (D)	2	0.276166164	0.208865	0.262242	0.324901	0.3504293	0.276166	0.313298	0.32026	0.264563	0.25528	0.394523	0.41541	0.433975	0.364354	0.420051	0.2413553	5.121838		
	3	1.220700859	0.802971	1.239267	1.53864	1.5432815	1.144117	1.069854	1.065212	0.80065	1.039684	1.320492	1.315851	2.08401	2.448364	1.944767	1.0953818	21.67324		
	4	0.835460664	0.573219	0.946855	1.137155	0.8609886	0.758877	0.471107	0.285449	0.28777	0.431655	0.654444	0.635878	1.705732	2.334648	1.294964	0.5708981	13.7851		
	5	0.129960548	0.116036	0.206544	0.201903	0.0858668	0.171734	0.071942	0.030169	0.018566	0.018566	0.048735	0.078905	0.452541	0.60803	0.201903	0.041773	2.483175		
	6	0.002320724	0	0.002321	0.004641	0	0.011604	0	0	0	0.002321	0.037132	0.023207	0.025528	0.013924	0	0	0.122998		
	7	0	0	0	0	0	0.006962	0	0	0	0	0	0.002321	0.002321	0	0	0	0.011604	0	43.19796
5 (E)	2	0.389881643	0.403806	0.556974	0.635878	0.7310281	0.666048	0.763518	0.823857	0.661406	0.51288	0.556974	0.679972	0.698538	0.693896	0.559294	0.4223718	9.756324		
	3	0.540728707	0.28777	0.596426	0.712462	0.6753307	0.99327	0.919007	0.900441	0.884196	1.137155	1.362265	0.893479	1.297285	0.981666	1.035043	0.6776514	13.89417		
	4	0.051055929	0.030169	0.076584	0.190299	0.1438849	0.206544	0.141564	0.167092	0.218148	0.371316	0.297053	0.116036	0.067301	0.067301	0.046414	0.0208865	2.21165		
	5	0	0	0.002321	0.002321	0.0046414	0.016245	0.023207	0.025528	0.018566	0.004641	0.011604	0	0.002321	0	0.002321	0.0023207	0.116036		
	6	0	0	0	0	0.0023207	0.002321	0	0	0	0	0	0	0	0	0	0	0.004641		
	7	0	0	0	0	0	0.002321	0	0	0	0	0	0	0	0	0	0	0.002321	0	25.98515
6 (F)	2	0.299373405	0.32026	0.368995	0.427013	0.9677419	1.132513	0.819216	0.675331	0.485031	0.380599	0.336505	0.334184	0.519842	0.742632	0.420051	0.2808076	8.510095		
	3	0.020886517	0.027849	0.048735	0.06498	0.1902994	0.533767	0.227431	0.111395	0.074263	0.085867	0.078905	0.023207	0.153168	0.12764	0.071942	0.0464145	1.886749		
	4	0	0	0	0.250638	0	0.002321	0	0	0	0.002321	0	0	0	0.002321	0	0	0.2576		
	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10.65444
7 (G)	2	0.055697378	0.122998	0.116036	0.19262	0.7194245	0.856347	0.331864	0.218148	0.132281	0.09747	0.104433	0.118357	0.204224	0.310977	0.083546	0.0765839	3.741007		
	3	0.002320724	0.009283	0.002321	0.002321	0.0371316	0.181016	0.013924	0	0.002321	0	0.002321	0	0.016245	0.037132	0.006962	0.0023207	0.315618		
	4	0	0	0	0.373637	0	0	0	0	0	0	0	0	0	0	0	0	0.373637		
	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4.430262
																		100		100

Notes:
(1) Wind Speed Categories defined as follows

Category	Wind Speed (mph)
2	>=0.75 to <3.5
3	>=3.5 to <7.5
4	>=7.5 to <12.5
5	>=12.5 to <18.5
6	>=18.5 to <24
7	>=24

Quad Cities

Joint Frequency Distribution
1995-1999
296 ft wind
296-33 ft Delta T

	Wind Speed Category(1)	Wind Direction Category N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Total	Calms	Total
1 (A)	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	3	4	5	4	8	2	1	3	6	5	9	10	20	18	29	23	12	159		
	4	33	45	30	25	12	9	28	57	28	90	49	47	78	59	72	73	735		
	5	20	23	28	11	5	11	28	62	69	120	24	32	47	87	102	60	729		
	6	1	3	4	5	0	5	9	21	29	35	5	3	11	44	37	9	221		
	7	1	0	2	2	0	1	0	4	3	16	0	0	2	6	8	0	45	0	1889
2 (B)	2	0	0	0	0	1	0	1	1	0	0	0	2	1	1	2	0	9		
	3	22	21	22	29	17	20	16	23	18	42	46	37	48	42	31	31	465		
	4	46	53	54	29	24	41	44	69	45	99	57	64	70	65	72	53	885		
	5	15	15	25	11	12	18	29	39	26	64	39	34	72	65	58	57	579		
	6	6	4	2	11	5	12	6	9	11	27	14	3	26	32	25	5	198		
	7	0	1	1	3	0	2	1	3	3	6	4	1	7	11	8	2	53	0	2189
3 (C)	2	0	0	0	0	0	2	1	1	0	4	3	4	4	3	1	1	24		
	3	42	28	34	33	38	28	30	42	30	64	65	40	56	63	65	53	711		
	4	43	54	50	31	37	39	53	69	41	93	49	60	76	69	59	61	884		
	5	23	15	33	26	20	34	33	37	32	50	43	49	78	73	76	40	662		
	6	9	6	5	13	9	12	7	12	12	28	12	12	38	47	29	9	260		
	7	1	1	0	4	2	5	0	0	5	16	3	1	17	22	8	3	88	0	2629
4 (D)	2	36	19	25	30	29	31	29	34	26	29	38	28	41	29	36	24	484		
	3	157	128	156	170	268	186	167	153	135	180	173	174	196	172	227	175	2817		
	4	295	260	334	351	391	296	229	264	182	208	246	275	340	519	505	308	5003		
	5	337	258	353	384	330	225	251	204	236	274	244	291	578	914	678	329	5886		
	6	73	107	215	234	99	152	103	98	116	164	131	112	338	485	325	109	2861		
	7	25	26	71	78	16	62	43	59	71	64	51	48	233	307	113	19	1286	0	18337
5 (E)	2	20	14	5	17	23	22	12	5	18	12	15	16	6	5	13	16	219		
	3	77	75	88	88	149	76	78	78	69	76	81	59	67	70	74	90	1295		
	4	187	159	169	182	255	211	198	219	205	264	201	168	208	204	236	247	3313		
	5	209	131	158	194	162	282	301	329	408	468	438	287	348	397	308	243	4663		
	6	13	8	27	46	20	89	95	145	237	310	173	49	69	51	25	10	1367		
	7	1	0	4	6	4	24	14	61	85	99	24	5	4	3	0	1	335	0	11192
6 (F)	2	14	19	13	17	12	6	7	9	11	9	8	14	13	15	8	8	183		
	3	46	48	52	62	72	57	46	50	46	22	48	33	45	20	41	52	740		
	4	104	75	99	80	95	113	122	205	166	179	104	72	61	60	80	108	1723		
	5	54	38	47	44	40	154	234	243	255	259	92	45	63	78	57	50	1753		
	6	1	0	3	2	0	26	38	29	28	31	15	2	3	7	2	2	189		
	7	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	2	0	4590
7 (G)	2	10	11	9	14	14	10	7	11	8	11	5	1	9	7	2	8	137		
	3	23	27	26	31	24	33	45	20	39	40	44	26	28	15	12	23	456		
	4	30	23	29	28	24	48	76	99	89	88	64	23	39	27	25	16	728		
	5	15	10	10	0	5	22	74	115	91	119	30	8	9	12	9	13	542		
	6	1	0	0	0	1	6	12	6	3	6	1	1	0	1	0	0	38		
	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1901
																				42727

Notes:
(1) Wind Speed Categories defined as follows

Category	Wind Speed (mph)
2	>=0.75 to <3.5
3	>=3.5 to <7.5
4	>=7.5 to <12.5
5	>=12.5 to <18.5
6	>=18.5 to <24
7	>=24

Quad Cities

Joint Frequency Distribution
1995-1999
296 ft wind
296-33 ft Delta T

	Wind Speed Category[1]	Wind Direction Category 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	Total		
1 (A)	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	3	0.009361762	0.011702	0.009362	0.018724	0.004681	0.00234	0.007021	0.014043	0.011702	0.021064	0.023404	0.046809	0.042128	0.067873	0.05383	0.0280853	0.37213		
	4	0.077234536	0.10532	0.070213	0.058511	0.028085	0.021064	0.065532	0.133405	0.065532	0.21064	0.114682	0.110001	0.182554	0.138086	0.168512	0.1708522	1.720224		
	5	0.046808809	0.05383	0.065532	0.025745	0.011702	0.025745	0.065532	0.145107	0.16149	0.280853	0.056171	0.074894	0.110001	0.203618	0.238725	0.1404264	1.706181		
	6	0.00234044	0.007021	0.009362	0.011702	0	0.011702	0.021064	0.049149	0.067873	0.081915	0.011702	0.007021	0.025745	0.102979	0.086596	0.021064	0.517237		
	7	0.00234044	0	0.004681	0.004681	0	0.00234	0	0.009362	0.007021	0.037447	0	0	0.004681	0.014043	0.018724	0	0.10532	0	4.421092
2 (B)	2	0	0	0	0	0.00234	0	0.00234	0.00234	0	0	0	0.004681	0.00234	0.00234	0.004681	0	0.021064		
	3	0.05148969	0.049149	0.05149	0.067873	0.039787	0.046809	0.037447	0.05383	0.042128	0.098298	0.10766	0.086596	0.112341	0.098298	0.072554	0.0725537	1.088305		
	4	0.107660262	0.124043	0.126384	0.067873	0.056171	0.095958	0.102979	0.16149	0.10532	0.231704	0.133405	0.149788	0.163831	0.152129	0.168512	0.1240433	2.07129		
	5	0.035106607	0.035107	0.058511	0.025745	0.028085	0.042128	0.067873	0.091277	0.060851	0.149788	0.091277	0.079575	0.168512	0.152129	0.135746	0.1334051	1.355115		
	6	0.014042643	0.009362	0.004681	0.025745	0.011702	0.028085	0.014043	0.021064	0.025745	0.063192	0.032766	0.007021	0.060851	0.074894	0.058511	0.0117022	0.463407		
	7	0	0.00234	0.00234	0.007021	0	0.004681	0.00234	0.007021	0.007021	0.014043	0.009362	0.00234	0.016383	0.025745	0.018724	0.0046809	0.124043	0	5.123224
3 (C)	2	0	0	0	0	0	0.004681	0.00234	0.00234	0	0.009362	0.007021	0.009362	0.009362	0.007021	0.00234	0.0023404	0.056171		
	3	0.0982985	0.065532	0.079575	0.077235	0.088937	0.065532	0.070213	0.098298	0.070213	0.149788	0.152129	0.093618	0.131065	0.147448	0.152129	0.1240433	1.664063		
	4	0.10063894	0.126384	0.117022	0.072554	0.086596	0.091277	0.124043	0.16149	0.095958	0.217661	0.114682	0.140426	0.177873	0.16149	0.138086	0.1427669	2.068949		
	5	0.053830131	0.035107	0.077235	0.060851	0.046809	0.079575	0.077235	0.086596	0.074894	0.117022	0.100639	0.114682	0.182554	0.170852	0.177873	0.0936176	1.549372		
	6	0.021063964	0.014043	0.011702	0.030426	0.021064	0.028085	0.016383	0.028085	0.028085	0.065532	0.028085	0.028085	0.088937	0.110001	0.067873	0.021064	0.608515		
	7	0.00234044	0.00234	0	0.009362	0.004681	0.011702	0	0	0.011702	0.037447	0.007021	0.00234	0.039787	0.05149	0.018724	0.0070213	0.205959	0	6.153018
4 (D)	2	0.084255857	0.044468	0.058511	0.070213	0.067873	0.072554	0.067873	0.079575	0.060851	0.067873	0.088937	0.065532	0.095958	0.067873	0.084256	0.0561706	1.132773		
	3	0.367449154	0.299576	0.365109	0.397875	0.627238	0.435322	0.390854	0.358087	0.315959	0.421279	0.404896	0.407237	0.458726	0.402556	0.53128	0.4095771	6.593021		
	4	0.690429939	0.608515	0.781707	0.821495	0.915112	0.69277	0.535961	0.617876	0.42596	0.486812	0.575748	0.643621	0.79575	1.214689	1.181922	0.7208557	11.70922		
	5	0.788728439	0.603834	0.826175	0.898729	0.772345	0.526599	0.587451	0.47745	0.552344	0.641281	0.571067	0.681068	1.352775	2.139163	1.586819	0.7700049	13.77583		
	6	0.170852154	0.250427	0.503195	0.547663	0.231704	0.355747	0.241065	0.229363	0.271491	0.383832	0.306598	0.262129	0.791069	1.135114	0.760643	0.255108	6.696		
	7	0.058511012	0.060851	0.166171	0.182554	0.037447	0.145107	0.100639	0.138086	0.166171	0.149788	0.119362	0.112341	0.545323	0.718515	0.26447	0.0444684	3.009806	0	42.91666
5 (E)	2	0.046808809	0.032766	0.011702	0.039787	0.05383	0.05149	0.028085	0.011702	0.042128	0.028085	0.035107	0.037447	0.014043	0.011702	0.030426	0.037447	0.512556		
	3	0.180213916	0.175533	0.205959	0.205959	0.348726	0.177873	0.182554	0.182554	0.16149	0.177873	0.189576	0.138086	0.15681	0.163831	0.173193	0.2106396	3.03087		
	4	0.437662368	0.37213	0.395534	0.42596	0.596812	0.493833	0.463407	0.512556	0.47979	0.617876	0.470429	0.393194	0.486812	0.47745	0.552344	0.5780888	7.753879		
	5	0.489152058	0.306598	0.36979	0.454045	0.379151	0.660004	0.704473	0.770005	0.9549	1.095326	1.025113	0.671706	0.814473	0.929155	0.720856	0.568727	10.91347		
	6	0.030425726	0.018724	0.063192	0.10766	0.046809	0.208299	0.222342	0.339364	0.554684	0.725537	0.404896	0.114682	0.16149	0.119362	0.058511	0.0234044	3.199382		
	7	0.00234044	0	0.009362	0.014043	0.009362	0.056171	0.032766	0.142767	0.198937	0.231704	0.056171	0.011702	0.009362	0.007021	0	0.0023404	0.784048	0	26.19421
6 (F)	2	0.032766167	0.044468	0.030426	0.039787	0.028085	0.014043	0.016383	0.021064	0.025745	0.021064	0.018724	0.032766	0.030426	0.035107	0.018724	0.0187235	0.428301		
	3	0.107660262	0.112341	0.121703	0.145107	0.168512	0.133405	0.10766	0.117022	0.10766	0.05149	0.112341	0.077235	0.10532	0.046809	0.095958	0.1217029	1.731926		
	4	0.243405809	0.175533	0.231704	0.187235	0.222342	0.26447	0.285534	0.47979	0.388513	0.418939	0.243406	0.168512	0.142767	0.140426	0.187235	0.2527676	4.032579		
	5	0.126383785	0.088937	0.110001	0.102979	0.093618	0.360428	0.547663	0.568727	0.596812	0.606174	0.215321	0.10532	0.147448	0.182554	0.133405	0.117022	4.102792		
	6	0.00234044	0	0.007021	0.004681	0	0.060851	0.088937	0.067873	0.065532	0.072554	0.035107	0.004681	0.007021	0.016383	0.004681	0.0046809	0.442343		
	7	0	0	0	0	0	0	0	0	0	0.004681	0	0	0	0	0	0	0.004681	0	10.74262
7 (G)	2	0.023404405	0.025745	0.021064	0.032766	0.032766	0.023404	0.016383	0.025745	0.018724	0.025745	0.011702	0.00234	0.021064	0.016383	0.004681	0.0187235	0.32064		
	3	0.053830131	0.063192	0.060851	0.072554	0.056171	0.077235	0.10532	0.046809	0.091277	0.093618	0.102979	0.060851	0.065532	0.035107	0.028085	0.0538301	1.067241		
	4	0.070213214	0.05383	0.067873	0.065532	0.056171	0.112341	0.177873	0.231704	0.208299	0.205959	0.149788	0.05383	0.091277	0.063192	0.058511	0.037447	1.703841		
	5	0.035106607	0.023404	0.023404	0	0.011702	0.05149	0.173193	0.269151	0.21298	0.278512	0.070213	0.018724	0.021064	0.028085	0.021064	0.0304257	1.268519		
	6	0.00234044	0	0	0	0.00234	0.014043	0.028085	0.014043	0.007021	0.014043	0.00234	0.00234	0	0.00234	0	0	0.088937		
	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4.449177
																		100		100

Notes:
(1) Wind Speed Categories defined as follows

Category	Wind Speed (mph)
2	>=0.75 to <3.5
3	>=3.5 to <7.5
4	>=7.5 to <12.5
5	>=12.5 to <18.5
6	>=18.5 to <24
7	>=24

ARCON96 Input and Output

Unit 1 MSIV to Control Room Intake (Turbine Building Area)

```
5
C:\TRACI'~1\PEACHB~1\BYRON\QDC95R1A.MET
C:\TRACI'~1\PEACHB~1\BYRON\QDC96R1A.MET
C:\TRACI'~1\PEACHB~1\BYRON\QDC97R1A.MET
C:\TRACI'~1\PEACHB~1\BYRON\QDC98R1A.MET
C:\TRACI'~1\PEACHB~1\BYRON\QDC99R1A.MET
   10.06
   59.74
  2
  1
    0.00
  4046.20
    0.00
    0.00
    0.00
  31  90
   72.90
    8.80
    0.00
1QDC.log
1QDC.cfd
 .2
    0.50
    4.30
  1  2  4  8  12  24  96 168 360 720
  1  2  4  8  11  22  87 152 324 648
    0.00    0.00
n
```

X/Q CUMULATIVE FREQUENCY DISTRIBUTIONS

XOQ	1	2	4	8	XOQ	12	24	96	168	360	720
Abv. Lim.	0.	0.	0.	0.	Abv. Lim.	0.	0.	0.	0.	0.	0.
9.120E-03	0.	0.	0.	0.	9.120E-03	0.	0.	0.	0.	0.	0.
8.318E-03	0.	0.	0.	0.	8.318E-03	0.	0.	0.	0.	0.	0.
7.586E-03	0.	0.	0.	0.	7.586E-03	0.	0.	0.	0.	0.	0.
6.918E-03	0.	0.	0.	0.	6.918E-03	0.	0.	0.	0.	0.	0.
6.310E-03	0.	0.	0.	0.	6.310E-03	0.	0.	0.	0.	0.	0.
5.754E-03	0.	0.	0.	0.	5.754E-03	0.	0.	0.	0.	0.	0.
5.248E-03	0.	0.	0.	0.	5.248E-03	0.	0.	0.	0.	0.	0.
4.786E-03	0.	0.	0.	0.	4.786E-03	0.	0.	0.	0.	0.	0.
4.365E-03	0.	0.	0.	0.	4.365E-03	0.	0.	0.	0.	0.	0.
3.981E-03	0.	0.	0.	0.	3.981E-03	0.	0.	0.	0.	0.	0.
3.631E-03	0.	0.	0.	0.	3.631E-03	0.	0.	0.	0.	0.	0.
3.311E-03	0.	0.	0.	0.	3.311E-03	0.	0.	0.	0.	0.	0.
3.020E-03	0.	0.	0.	0.	3.020E-03	0.	0.	0.	0.	0.	0.
2.754E-03	0.	0.	0.	0.	2.754E-03	0.	0.	0.	0.	0.	0.
2.512E-03	0.	0.	0.	0.	2.512E-03	0.	0.	0.	0.	0.	0.
2.291E-03	0.	0.	0.	0.	2.291E-03	0.	0.	0.	0.	0.	0.
2.089E-03	0.	0.	0.	0.	2.089E-03	0.	0.	0.	0.	0.	0.
1.905E-03	0.	0.	0.	0.	1.905E-03	0.	0.	0.	0.	0.	0.
1.738E-03	0.	0.	0.	0.	1.738E-03	0.	0.	0.	0.	0.	0.
1.585E-03	0.	0.	0.	0.	1.585E-03	0.	0.	0.	0.	0.	0.
1.445E-03	0.	0.	0.	0.	1.445E-03	0.	0.	0.	0.	0.	0.
1.318E-03	1.	0.	0.	0.	1.318E-03	0.	0.	0.	0.	0.	0.
1.202E-03	203.	110.	36.	2.	1.202E-03	0.	0.	0.	0.	0.	0.
1.096E-03	652.	531.	338.	189.	1.096E-03	0.	0.	0.	0.	0.	0.
1.000E-03	2636.	2136.	1557.	1022.	1.000E-03	8.	0.	0.	0.	0.	0.
9.120E-04	3825.	3135.	2445.	1787.	9.120E-04	224.	0.	0.	0.	0.	0.
8.318E-04	4576.	3931.	3169.	2547.	8.318E-04	1014.	0.	0.	0.	0.	0.
7.586E-04	5157.	4447.	3890.	3229.	7.586E-04	1743.	53.	0.	0.	0.	0.
6.918E-04	5822.	4909.	4521.	3817.	6.918E-04	2426.	418.	0.	0.	0.	0.
6.310E-04	6210.	5266.	4978.	4423.	6.310E-04	3117.	1008.	0.	0.	0.	0.
5.754E-04	6534.	5614.	5430.	4997.	5.754E-04	3788.	1590.	0.	0.	0.	0.
5.248E-04	6907.	6060.	5888.	5558.	5.248E-04	4400.	2186.	2.	0.	0.	0.
4.786E-04	7208.	6832.	6516.	6157.	4.786E-04	5014.	2844.	71.	0.	0.	0.
4.365E-04	7441.	7336.	6983.	6681.	4.365E-04	5611.	3538.	181.	0.	0.	0.
3.981E-04	7731.	7789.	7433.	7197.	3.981E-04	6181.	4216.	402.	14.	0.	0.
3.631E-04	8518.	8403.	7859.	7831.	3.631E-04	6741.	4945.	784.	57.	0.	0.
3.311E-04	8652.	8767.	8189.	8297.	3.311E-04	7342.	5628.	1356.	175.	0.	0.
3.020E-04	8730.	9042.	8569.	8724.	3.020E-04	7860.	6355.	2242.	594.	0.	0.
2.754E-04	8767.	9273.	8986.	9151.	2.754E-04	8421.	7106.	3098.	1043.	0.	0.
2.512E-04	8793.	9529.	9544.	9727.	2.512E-04	8954.	7822.	4073.	1621.	66.	0.
2.291E-04	8809.	9745.	10000.	10233.	2.291E-04	9468.	8515.	5105.	2700.	523.	0.
2.089E-04	8825.	9933.	10417.	10693.	2.089E-04	9950.	9193.	6188.	3904.	927.	0.
1.905E-04	8829.	10597.	10942.	11143.	1.905E-04	10412.	9891.	7392.	5597.	2085.	153.
1.738E-04	8830.	10634.	11257.	11454.	1.738E-04	10900.	10549.	8642.	7532.	3584.	877.
1.585E-04	8830.	10659.	11512.	11785.	1.585E-04	11470.	11225.	10119.	9104.	5419.	2310.
1.445E-04	8831.	10667.	11713.	12274.	1.445E-04	12000.	11831.	11423.	10560.	7626.	4802.
1.318E-04	8831.	10675.	11955.	12536.	1.318E-04	12469.	12444.	12735.	12415.	10823.	7435.
1.202E-04	8831.	10683.	12198.	13128.	1.202E-04	12865.	13119.	14057.	13968.	13793.	11632.
1.096E-04	8831.	10684.	12446.	13520.	1.096E-04	13271.	13664.	15360.	16151.	16525.	15134.
1.000E-04	8831.	10687.	12600.	13970.	1.000E-04	13754.	14260.	16699.	17708.	19639.	18571.
9.120E-05	8831.	10687.	13225.	14396.	9.120E-05	14166.	14801.	18249.	19603.	22346.	22727.

8.318E-05	8831.	10687.	13251.	14689.	8.318E-05	14702.	15354.	19533.	21145.	24635.	25914.
7.586E-05	8831.	10687.	13274.	14960.	7.586E-05	15107.	16014.	20742.	22764.	26626.	28247.
6.918E-05	8831.	10687.	13280.	15152.	6.918E-05	15511.	16606.	21768.	24209.	28047.	29945.
6.310E-05	8831.	10687.	13286.	15512.	6.310E-05	15917.	17133.	22955.	25578.	29392.	32079.
5.754E-05	8831.	10687.	13289.	15830.	5.754E-05	16260.	17620.	24100.	26898.	30803.	34123.
5.248E-05	8831.	10687.	13289.	16003.	5.248E-05	16583.	18069.	25049.	28287.	32567.	36333.
4.786E-05	8831.	10687.	13289.	16798.	4.786E-05	16952.	18699.	25920.	29702.	33590.	37976.
4.365E-05	8831.	10687.	13289.	16837.	4.365E-05	17366.	19218.	26756.	30746.	34927.	39453.
3.981E-05	8831.	10687.	13289.	16858.	3.981E-05	17736.	19779.	27535.	31678.	36183.	40094.
3.631E-05	8831.	10687.	13289.	16870.	3.631E-05	18098.	20313.	28335.	32458.	37257.	40463.
3.311E-05	8831.	10687.	13289.	16874.	3.311E-05	18311.	20753.	28952.	33316.	37782.	40918.
3.020E-05	8831.	10687.	13289.	16880.	3.020E-05	18949.	21234.	29625.	34021.	38635.	41224.
2.754E-05	8831.	10687.	13289.	16881.	2.754E-05	19024.	21630.	30190.	34711.	39307.	41423.
2.512E-05	8831.	10687.	13289.	16881.	2.512E-05	19162.	22066.	30943.	35327.	39930.	41652.
2.291E-05	8831.	10687.	13289.	16881.	2.291E-05	19279.	22426.	31616.	35979.	40206.	41854.
2.089E-05	8831.	10687.	13289.	16881.	2.089E-05	19379.	22911.	32196.	36448.	40511.	42028.
1.905E-05	8831.	10687.	13289.	16881.	1.905E-05	19689.	23442.	32729.	36856.	40784.	42301.
1.738E-05	8831.	10687.	13289.	16881.	1.738E-05	19762.	23735.	33228.	37183.	41051.	42430.
1.585E-05	8831.	10687.	13289.	16881.	1.585E-05	19767.	24319.	33634.	37513.	41284.	42465.
1.445E-05	8831.	10687.	13289.	16881.	1.445E-05	19774.	24482.	34134.	37793.	41556.	42477.
1.318E-05	8831.	10687.	13289.	16881.	1.318E-05	19776.	24651.	34524.	38321.	41570.	42478.
1.202E-05	8831.	10687.	13289.	16881.	1.202E-05	19776.	24948.	34916.	38520.	41752.	42478.
1.096E-05	8831.	10687.	13289.	16881.	1.096E-05	19777.	25228.	35326.	38898.	41768.	42478.
1.000E-05	8831.	10687.	13289.	16881.	1.000E-05	19777.	25371.	35870.	39143.	41880.	42478.
9.120E-06	8831.	10687.	13289.	16881.	9.120E-06	19777.	26029.	36077.	39382.	41896.	42478.
8.318E-06	8831.	10687.	13289.	16881.	8.318E-06	19777.	26043.	36459.	39630.	41918.	42478.
7.586E-06	8831.	10687.	13289.	16881.	7.586E-06	19777.	26045.	36693.	39815.	42047.	42478.
6.918E-06	8831.	10687.	13289.	16881.	6.918E-06	19777.	26051.	36928.	39923.	42289.	42478.
6.310E-06	8831.	10687.	13289.	16881.	6.310E-06	19777.	26052.	37057.	40157.	42389.	42478.
5.754E-06	8831.	10687.	13289.	16881.	5.754E-06	19777.	26052.	37199.	40512.	42470.	42478.
5.248E-06	8831.	10687.	13289.	16881.	5.248E-06	19777.	26053.	37454.	40554.	42492.	42478.
4.786E-06	8831.	10687.	13289.	16881.	4.786E-06	19777.	26053.	37829.	40874.	42522.	42478.
4.365E-06	8831.	10687.	13289.	16881.	4.365E-06	19777.	26053.	37998.	40935.	42589.	42478.
3.981E-06	8831.	10687.	13289.	16881.	3.981E-06	19777.	26053.	38150.	40991.	42672.	42478.
3.631E-06	8831.	10687.	13289.	16881.	3.631E-06	19777.	26053.	38244.	41019.	42732.	42478.
3.311E-06	8831.	10687.	13289.	16881.	3.311E-06	19777.	26053.	38311.	41030.	42790.	42478.
3.020E-06	8831.	10687.	13289.	16881.	3.020E-06	19777.	26053.	38670.	41130.	42790.	42478.
2.754E-06	8831.	10687.	13289.	16881.	2.754E-06	19777.	26053.	38958.	41322.	42790.	42478.
2.512E-06	8831.	10687.	13289.	16881.	2.512E-06	19777.	26053.	39123.	41417.	42790.	42478.
2.291E-06	8831.	10687.	13289.	16881.	2.291E-06	19777.	26053.	39559.	41492.	42790.	42478.
2.089E-06	8831.	10687.	13289.	16881.	2.089E-06	19777.	26053.	39576.	41511.	42872.	42478.
1.905E-06	8831.	10687.	13289.	16881.	1.905E-06	19777.	26053.	39578.	41524.	42872.	42478.
1.738E-06	8831.	10687.	13289.	16881.	1.738E-06	19777.	26053.	39578.	41624.	42872.	42478.
1.585E-06	8831.	10687.	13289.	16881.	1.585E-06	19777.	26053.	39579.	41741.	42872.	42478.
1.445E-06	8831.	10687.	13289.	16881.	1.445E-06	19777.	26053.	39579.	41830.	42872.	42478.
1.318E-06	8831.	10687.	13289.	16881.	1.318E-06	19777.	26053.	39579.	42082.	42872.	42478.
1.202E-06	8831.	10687.	13289.	16881.	1.202E-06	19777.	26053.	39579.	42082.	42872.	42478.
1.096E-06	8831.	10687.	13289.	16881.	1.096E-06	19777.	26053.	39579.	42082.	42872.	42478.
1.000E-06	8831.	10687.	13289.	16881.	1.000E-06	19777.	26053.	39579.	42082.	42872.	42478.
Belw. Lim.	0.	0.	0.	0.	Belw. Lim.	0.	0.	0.	0.	0.	0.

Program Title: ARCON96.

Developed For: U.S. Nuclear Regulatory Commission
Office of Nuclear Reactor Regulation
Division of Reactor Program Management

Date: June 25, 1997 11:00 a.m.

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Code Documentation: NUREG/CR-6331 Rev. 1

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Program Run 9/ 9/2004 at 11:04:57

******* ARCON INPUT **********

Number of Meteorological Data Files = 5
Meteorological Data File Names
C:\TRACI'~1\PEACHB~1\BYRON\QDC95R1A.MET
C:\TRACI'~1\PEACHB~1\BYRON\QDC96R1A.MET
C:\TRACI'~1\PEACHB~1\BYRON\QDC97R1A.MET
C:\TRACI'~1\PEACHB~1\BYRON\QDC98R1A.MET
C:\TRACI'~1\PEACHB~1\BYRON\QDC99R1A.MET

Height of lower wind instrument (m) = 10.1
Height of upper wind instrument (m) = 59.7
Wind speeds entered as miles per hour

Ground-level release
Release height (m) = .0
Building Area (m^2) = 4046.2
Effluent vertical velocity (m/s) = .00
Vent or stack flow (m^3/s) = .00
Vent or stack radius (m) = .00

Direction .. intake to source (deg) = 031
Wind direction sector width (deg) = 90
Wind direction window (deg) = 346 - 076
Distance to intake (m) = 72.9

Intake height (m) = 8.8
Terrain elevation difference (m) = .0

Output file names
1QDC.log
1QDC.cfd

Minimum Wind Speed (m/s) = .5
Surface roughness length (m) = .20
Sector averaging constant = 4.3

Initial value of sigma y = .00
Initial value of sigma z = .00

Expanded output for code testing not selected

Total number of hours of data processed = 43824
Hours of missing data = 344
Hours direction in window = 8185
Hours elevated plume w/ dir. in window = 0
Hours of calm winds = 646
Hours direction not in window or calm = 34649

DISTRIBUTION SUMMARY DATA BY AVERAGING INTERVAL

AVER. PER.	1	2	4	8	12	24	96	168	360	720
UPPER LIM.	1.00E-02	1.00E-02	1.00E-02	1.00E-02	1.00E-02	1.00E-02	1.00E-02	1.00E-02	1.00E-02	1.00E-02
LOW LIM.	1.00E-06	1.00E-06	1.00E-06	1.00E-06	1.00E-06	1.00E-06	1.00E-06	1.00E-06	1.00E-06	1.00E-06
ABOVE RANGE	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
IN RANGE	8831.	10687.	13289.	16881.	19777.	26053.	39579.	42082.	42872.	42478.
BELOW RANGE	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
ZERO	34649.	32753.	30071.	26319.	23472.	17072.	3118.	531.	0.	0.
TOTAL X/Qs	43480.	43440.	43360.	43200.	43249.	43125.	42697.	42613.	42872.	42478.
% NON ZERO	20.31	24.60	30.65	39.08	45.73	60.41	92.70	98.75	100.00	100.00

95th PERCENTILE X/Q VALUES
1.02E-03 9.97E-04 9.39E-04 8.73E-04 7.18E-04 5.27E-04 3.06E-04 2.41E-04 1.90E-04 1.60E-04

95% X/Q for standard averaging intervals

0 to 2 hours	1.02E-03
2 to 8 hours	8.23E-04
8 to 24 hours	3.55E-04
1 to 4 days	2.32E-04
4 to 30 days	1.38E-04

HOURLY VALUE RANGE

	MAX X/Q	MIN X/Q
CENTERLINE	1.39E-03	1.53E-04
SECTOR-AVERAGE	8.12E-04	8.94E-05

NORMAL PROGRAM COMPLETION

Unit 1 MSIV to Control Room Intake (Reactor Building Area)

```
5
C:\TRACI'~1\PEACHB~1\BYRON\QDC95R1A.MET
C:\TRACI'~1\PEACHB~1\BYRON\QDC96R1A.MET
C:\TRACI'~1\PEACHB~1\BYRON\QDC97R1A.MET
C:\TRACI'~1\PEACHB~1\BYRON\QDC98R1A.MET
C:\TRACI'~1\PEACHB~1\BYRON\QDC99R1A.MET
   10.06
   59.74
  2
  1
    0.00
 3355.00
    0.00
    0.00
    0.00
 31  90
   72.90
    8.80
    0.00
2QDC.log
2QDC.cfd
 .2
    0.50
    4.30
  1  2  4  8  12  24  96 168 360 720
  1  2  4  8  11  22  87 152 324 648
    0.00    0.00
n
```

X/Q CUMULATIVE FREQUENCY DISTRIBUTIONS

XOQ	1	2	4	8	XOQ	12	24	96	168	360	720
Abv. Lim.	0.	0.	0.	0.	Abv. Lim.	0.	0.	0.	0.	0.	0.
9.120E-03	0.	0.	0.	0.	9.120E-03	0.	0.	0.	0.	0.	0.
8.318E-03	0.	0.	0.	0.	8.318E-03	0.	0.	0.	0.	0.	0.
7.586E-03	0.	0.	0.	0.	7.586E-03	0.	0.	0.	0.	0.	0.
6.918E-03	0.	0.	0.	0.	6.918E-03	0.	0.	0.	0.	0.	0.
6.310E-03	0.	0.	0.	0.	6.310E-03	0.	0.	0.	0.	0.	0.
5.754E-03	0.	0.	0.	0.	5.754E-03	0.	0.	0.	0.	0.	0.
5.248E-03	0.	0.	0.	0.	5.248E-03	0.	0.	0.	0.	0.	0.
4.786E-03	0.	0.	0.	0.	4.786E-03	0.	0.	0.	0.	0.	0.
4.365E-03	0.	0.	0.	0.	4.365E-03	0.	0.	0.	0.	0.	0.
3.981E-03	0.	0.	0.	0.	3.981E-03	0.	0.	0.	0.	0.	0.
3.631E-03	0.	0.	0.	0.	3.631E-03	0.	0.	0.	0.	0.	0.
3.311E-03	0.	0.	0.	0.	3.311E-03	0.	0.	0.	0.	0.	0.
3.020E-03	0.	0.	0.	0.	3.020E-03	0.	0.	0.	0.	0.	0.
2.754E-03	0.	0.	0.	0.	2.754E-03	0.	0.	0.	0.	0.	0.
2.512E-03	0.	0.	0.	0.	2.512E-03	0.	0.	0.	0.	0.	0.
2.291E-03	0.	0.	0.	0.	2.291E-03	0.	0.	0.	0.	0.	0.
2.089E-03	0.	0.	0.	0.	2.089E-03	0.	0.	0.	0.	0.	0.
1.905E-03	0.	0.	0.	0.	1.905E-03	0.	0.	0.	0.	0.	0.
1.738E-03	0.	0.	0.	0.	1.738E-03	0.	0.	0.	0.	0.	0.
1.585E-03	0.	0.	0.	0.	1.585E-03	0.	0.	0.	0.	0.	0.
1.445E-03	0.	0.	0.	0.	1.445E-03	0.	0.	0.	0.	0.	0.
1.318E-03	1.	0.	0.	0.	1.318E-03	0.	0.	0.	0.	0.	0.
1.202E-03	219.	119.	39.	3.	1.202E-03	0.	0.	0.	0.	0.	0.
1.096E-03	652.	537.	345.	192.	1.096E-03	0.	0.	0.	0.	0.	0.
1.000E-03	2636.	2142.	1563.	1030.	1.000E-03	9.	0.	0.	0.	0.	0.
9.120E-04	3843.	3136.	2449.	1794.	9.120E-04	226.	0.	0.	0.	0.	0.
8.318E-04	4576.	3932.	3172.	2551.	8.318E-04	1019.	0.	0.	0.	0.	0.
7.586E-04	5178.	4452.	3894.	3237.	7.586E-04	1748.	55.	0.	0.	0.	0.
6.918E-04	5824.	4914.	4524.	3820.	6.918E-04	2433.	419.	0.	0.	0.	0.
6.310E-04	6210.	5267.	4979.	4426.	6.310E-04	3123.	1013.	0.	0.	0.	0.
5.754E-04	6535.	5616.	5432.	4999.	5.754E-04	3792.	1595.	0.	0.	0.	0.
5.248E-04	6907.	6074.	5895.	5562.	5.248E-04	4402.	2191.	2.	0.	0.	0.
4.786E-04	7208.	6837.	6517.	6160.	4.786E-04	5016.	2844.	71.	0.	0.	0.
4.365E-04	7441.	7336.	6983.	6685.	4.365E-04	5615.	3546.	182.	0.	0.	0.
3.981E-04	7731.	7789.	7434.	7199.	3.981E-04	6183.	4220.	405.	15.	0.	0.
3.631E-04	8518.	8405.	7859.	7832.	3.631E-04	6743.	4952.	786.	57.	0.	0.
3.311E-04	8654.	8767.	8191.	8299.	3.311E-04	7344.	5631.	1363.	176.	0.	0.
3.020E-04	8730.	9042.	8569.	8724.	3.020E-04	7862.	6356.	2246.	603.	0.	0.
2.754E-04	8767.	9274.	8986.	9151.	2.754E-04	8423.	7111.	3101.	1046.	0.	0.
2.512E-04	8793.	9529.	9552.	9728.	2.512E-04	8954.	7826.	4082.	1625.	67.	0.
2.291E-04	8809.	9745.	10000.	10243.	2.291E-04	9468.	8519.	5110.	2701.	524.	0.
2.089E-04	8825.	9933.	10418.	10693.	2.089E-04	9950.	9195.	6195.	3912.	933.	0.
1.905E-04	8829.	10597.	10942.	11143.	1.905E-04	10413.	9895.	7396.	5610.	2098.	155.
1.738E-04	8830.	10635.	11263.	11454.	1.738E-04	10903.	10551.	8647.	7540.	3612.	885.
1.585E-04	8830.	10659.	11513.	11785.	1.585E-04	11479.	11225.	10124.	9146.	5425.	2316.
1.445E-04	8831.	10667.	11713.	12274.	1.445E-04	12002.	11833.	11427.	10562.	7636.	4810.
1.318E-04	8831.	10675.	11955.	12536.	1.318E-04	12470.	12446.	12736.	12423.	10833.	7449.
1.202E-04	8831.	10683.	12198.	13129.	1.202E-04	12865.	13120.	14060.	13978.	13801.	11693.
1.096E-04	8831.	10684.	12446.	13520.	1.096E-04	13271.	13664.	15365.	16157.	16537.	15174.
1.000E-04	8831.	10687.	12600.	13971.	1.000E-04	13760.	14260.	16706.	17713.	19655.	18578.
9.120E-05	8831.	10687.	13225.	14399.	9.120E-05	14167.	14801.	18252.	19606.	22351.	22744.

8.318E-05	8831.	10687.	13251.	14689.	8.318E-05	14702.	15354.	19534.	21155.	24638.	25916.
7.586E-05	8831.	10687.	13274.	14960.	7.586E-05	15108.	16015.	20742.	22772.	26630.	28257.
6.918E-05	8831.	10687.	13280.	15152.	6.918E-05	15511.	16606.	21768.	24212.	28048.	29948.
6.310E-05	8831.	10687.	13286.	15512.	6.310E-05	15917.	17134.	22955.	25578.	29392.	32080.
5.754E-05	8831.	10687.	13289.	15830.	5.754E-05	16260.	17621.	24101.	26898.	30803.	34151.
5.248E-05	8831.	10687.	13289.	16003.	5.248E-05	16583.	18069.	25049.	28290.	32596.	36339.
4.786E-05	8831.	10687.	13289.	16798.	4.786E-05	16952.	18700.	25920.	29704.	33595.	37977.
4.365E-05	8831.	10687.	13289.	16837.	4.365E-05	17367.	19221.	26757.	30746.	34928.	39454.
3.981E-05	8831.	10687.	13289.	16858.	3.981E-05	17736.	19779.	27536.	31681.	36220.	40094.
3.631E-05	8831.	10687.	13289.	16870.	3.631E-05	18098.	20313.	28335.	32458.	37257.	40463.
3.311E-05	8831.	10687.	13289.	16874.	3.311E-05	18311.	20753.	28953.	33316.	37782.	40918.
3.020E-05	8831.	10687.	13289.	16880.	3.020E-05	18949.	21234.	29626.	34022.	38635.	41224.
2.754E-05	8831.	10687.	13289.	16881.	2.754E-05	19024.	21630.	30190.	34711.	39311.	41423.
2.512E-05	8831.	10687.	13289.	16881.	2.512E-05	19162.	22066.	30943.	35328.	39934.	41652.
2.291E-05	8831.	10687.	13289.	16881.	2.291E-05	19279.	22426.	31616.	35980.	40206.	41854.
2.089E-05	8831.	10687.	13289.	16881.	2.089E-05	19379.	22911.	32197.	36448.	40511.	42028.
1.905E-05	8831.	10687.	13289.	16881.	1.905E-05	19689.	23442.	32729.	36856.	40784.	42301.
1.738E-05	8831.	10687.	13289.	16881.	1.738E-05	19762.	23735.	33228.	37183.	41051.	42430.
1.585E-05	8831.	10687.	13289.	16881.	1.585E-05	19767.	24319.	33634.	37513.	41284.	42465.
1.445E-05	8831.	10687.	13289.	16881.	1.445E-05	19774.	24482.	34134.	37793.	41556.	42477.
1.318E-05	8831.	10687.	13289.	16881.	1.318E-05	19776.	24651.	34524.	38321.	41570.	42478.
1.202E-05	8831.	10687.	13289.	16881.	1.202E-05	19776.	24948.	34916.	38520.	41752.	42478.
1.096E-05	8831.	10687.	13289.	16881.	1.096E-05	19777.	25228.	35326.	38899.	41768.	42478.
1.000E-05	8831.	10687.	13289.	16881.	1.000E-05	19777.	25371.	35870.	39143.	41880.	42478.
9.120E-06	8831.	10687.	13289.	16881.	9.120E-06	19777.	26029.	36077.	39382.	41896.	42478.
8.318E-06	8831.	10687.	13289.	16881.	8.318E-06	19777.	26043.	36459.	39630.	41919.	42478.
7.586E-06	8831.	10687.	13289.	16881.	7.586E-06	19777.	26045.	36693.	39815.	42047.	42478.
6.918E-06	8831.	10687.	13289.	16881.	6.918E-06	19777.	26051.	36928.	39923.	42289.	42478.
6.310E-06	8831.	10687.	13289.	16881.	6.310E-06	19777.	26052.	37057.	40157.	42389.	42478.
5.754E-06	8831.	10687.	13289.	16881.	5.754E-06	19777.	26052.	37199.	40512.	42472.	42478.
5.248E-06	8831.	10687.	13289.	16881.	5.248E-06	19777.	26053.	37454.	40554.	42492.	42478.
4.786E-06	8831.	10687.	13289.	16881.	4.786E-06	19777.	26053.	37829.	40874.	42522.	42478.
4.365E-06	8831.	10687.	13289.	16881.	4.365E-06	19777.	26053.	37998.	40935.	42589.	42478.
3.981E-06	8831.	10687.	13289.	16881.	3.981E-06	19777.	26053.	38150.	40991.	42672.	42478.
3.631E-06	8831.	10687.	13289.	16881.	3.631E-06	19777.	26053.	38244.	41019.	42732.	42478.
3.311E-06	8831.	10687.	13289.	16881.	3.311E-06	19777.	26053.	38311.	41030.	42790.	42478.
3.020E-06	8831.	10687.	13289.	16881.	3.020E-06	19777.	26053.	38670.	41130.	42790.	42478.
2.754E-06	8831.	10687.	13289.	16881.	2.754E-06	19777.	26053.	38958.	41322.	42790.	42478.
2.512E-06	8831.	10687.	13289.	16881.	2.512E-06	19777.	26053.	39123.	41417.	42790.	42478.
2.291E-06	8831.	10687.	13289.	16881.	2.291E-06	19777.	26053.	39559.	41492.	42790.	42478.
2.089E-06	8831.	10687.	13289.	16881.	2.089E-06	19777.	26053.	39576.	41511.	42872.	42478.
1.905E-06	8831.	10687.	13289.	16881.	1.905E-06	19777.	26053.	39578.	41524.	42872.	42478.
1.738E-06	8831.	10687.	13289.	16881.	1.738E-06	19777.	26053.	39578.	41624.	42872.	42478.
1.585E-06	8831.	10687.	13289.	16881.	1.585E-06	19777.	26053.	39579.	41741.	42872.	42478.
1.445E-06	8831.	10687.	13289.	16881.	1.445E-06	19777.	26053.	39579.	41830.	42872.	42478.
1.318E-06	8831.	10687.	13289.	16881.	1.318E-06	19777.	26053.	39579.	42082.	42872.	42478.
1.202E-06	8831.	10687.	13289.	16881.	1.202E-06	19777.	26053.	39579.	42082.	42872.	42478.
1.096E-06	8831.	10687.	13289.	16881.	1.096E-06	19777.	26053.	39579.	42082.	42872.	42478.
1.000E-06	8831.	10687.	13289.	16881.	1.000E-06	19777.	26053.	39579.	42082.	42872.	42478.
Belw. Lim.	0.	0.	0.	0.	Belw. Lim.	0.	0.	0.	0.	0.	0.

Program Title: ARCON96.

Developed For: U.S. Nuclear Regulatory Commission
Office of Nuclear Reactor Regulation
Division of Reactor Program Management

Date: June 25, 1997 11:00 a.m.

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Code Documentation: NUREG/CR-6331 Rev. 1

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Program Run 9/ 9/2004 at 11:36:52

******* ARCON INPUT **********

Number of Meteorological Data Files = 5
Meteorological Data File Names
C:\TRACI'~1\PEACHB~1\BYRON\QDC95R1A.MET
C:\TRACI'~1\PEACHB~1\BYRON\QDC96R1A.MET
C:\TRACI'~1\PEACHB~1\BYRON\QDC97R1A.MET
C:\TRACI'~1\PEACHB~1\BYRON\QDC98R1A.MET
C:\TRACI'~1\PEACHB~1\BYRON\QDC99R1A.MET

Height of lower wind instrument (m) = 10.1
Height of upper wind instrument (m) = 59.7
Wind speeds entered as miles per hour

Ground-level release
Release height (m) = .0
Building Area (m^2) = 3355.0
Effluent vertical velocity (m/s) = .00
Vent or stack flow (m^3/s) = .00
Vent or stack radius (m) = .00

Direction .. intake to source (deg) = 031
Wind direction sector width (deg) = 90
Wind direction window (deg) = 346 - 076
Distance to intake (m) = 72.9

Intake height (m) = 8.8
Terrain elevation difference (m) = .0

Output file names
2QDC.log
2QDC.cfd

Minimum Wind Speed (m/s) = .5
Surface roughness length (m) = .20
Sector averaging constant = 4.3

Initial value of sigma y = .00
Initial value of sigma z = .00

Expanded output for code testing not selected

Total number of hours of data processed = 43824
Hours of missing data = 344
Hours direction in window = 8185
Hours elevated plume w/ dir. in window = 0
Hours of calm winds = 646
Hours direction not in window or calm = 34649

DISTRIBUTION SUMMARY DATA BY AVERAGING INTERVAL

AVER. PER.	1	2	4	8	12	24	96	168	360	720
UPPER LIM.	1.00E-02	1.00E-02	1.00E-02	1.00E-02	1.00E-02	1.00E-02	1.00E-02	1.00E-02	1.00E-02	1.00E-02
LOW LIM.	1.00E-06	1.00E-06	1.00E-06	1.00E-06	1.00E-06	1.00E-06	1.00E-06	1.00E-06	1.00E-06	1.00E-06
ABOVE RANGE	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
IN RANGE	8831.	10687.	13289.	16881.	19777.	26053.	39579.	42082.	42872.	42478.
BELOW RANGE	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
ZERO	34649.	32753.	30071.	26319.	23472.	17072.	3118.	531.	0.	0.
TOTAL X/Qs	43480.	43440.	43360.	43200.	43249.	43125.	42697.	42613.	42872.	42478.
% NON ZERO	20.31	24.60	30.65	39.08	45.73	60.41	92.70	98.75	100.00	100.00

95th PERCENTILE X/Q VALUES
1.02E-03 9.97E-04 9.40E-04 8.73E-04 7.18E-04 5.28E-04 3.06E-04 2.41E-04 1.90E-04 1.61E-04

95% X/Q for standard averaging intervals

0 to 2 hours 1.02E-03
2 to 8 hours 8.23E-04
8 to 24 hours 3.55E-04
1 to 4 days 2.32E-04
4 to 30 days 1.38E-04

HOURLY VALUE RANGE

	MAX X/Q	MIN X/Q
CENTERLINE	1.39E-03	1.54E-04
SECTOR-AVERAGE	8.13E-04	8.96E-05

NORMAL PROGRAM COMPLETION

Unit 2 MSIV to Control Room Intake (Turbine Building Area)

```
5
C:\TRACI'~1\PEACHB~1\BYRON\QDC95R1A.MET
C:\TRACI'~1\PEACHB~1\BYRON\QDC96R1A.MET
C:\TRACI'~1\PEACHB~1\BYRON\QDC97R1A.MET
C:\TRACI'~1\PEACHB~1\BYRON\QDC98R1A.MET
C:\TRACI'~1\PEACHB~1\BYRON\QDC99R1A.MET
  10.06
  59.74
 2
 1
  0.00
 3077.60
  0.00
  0.00
  0.00
 17 90
  121.50
  8.80
  0.00
3QDC.log
3QDC.cfd
 .2
  0.50
  4.30
 1  2  4  8  12  24  96 168 360 720
 1  2  4  8  11  22  87 152 324 648
  0.00   0.00
n
```

X/Q CUMULATIVE FREQUENCY DISTRIBUTIONS

XOQ	1	2	4	8	XOQ	12	24	96	168	360	720
Abv. Lim.	0.	0.	0.	0.	Abv. Lim.	0.	0.	0.	0.	0.	0.
9.120E-04	0.	0.	0.	0.	9.120E-04	0.	0.	0.	0.	0.	0.
8.318E-04	0.	0.	0.	0.	8.318E-04	0.	0.	0.	0.	0.	0.
7.586E-04	0.	0.	0.	0.	7.586E-04	0.	0.	0.	0.	0.	0.
6.918E-04	0.	0.	0.	0.	6.918E-04	0.	0.	0.	0.	0.	0.
6.310E-04	0.	0.	0.	0.	6.310E-04	0.	0.	0.	0.	0.	0.
5.754E-04	0.	0.	0.	0.	5.754E-04	0.	0.	0.	0.	0.	0.
5.248E-04	1.	0.	0.	0.	5.248E-04	0.	0.	0.	0.	0.	0.
4.786E-04	4.	0.	0.	0.	4.786E-04	0.	0.	0.	0.	0.	0.
4.365E-04	452.	262.	150.	63.	4.365E-04	0.	0.	0.	0.	0.	0.
3.981E-04	1730.	1369.	937.	526.	3.981E-04	0.	0.	0.	0.	0.	0.
3.631E-04	3328.	2694.	2029.	1316.	3.631E-04	67.	0.	0.	0.	0.	0.
3.311E-04	4157.	3496.	2660.	1974.	3.311E-04	618.	0.	0.	0.	0.	0.
3.020E-04	4712.	4017.	3242.	2550.	3.020E-04	1235.	0.	0.	0.	0.	0.
2.754E-04	5487.	4487.	3943.	3207.	2.754E-04	1843.	224.	0.	0.	0.	0.
2.512E-04	5940.	4848.	4455.	3791.	2.512E-04	2443.	587.	0.	0.	0.	0.
2.291E-04	6232.	5187.	4900.	4447.	2.291E-04	3062.	1036.	0.	0.	0.	0.
2.089E-04	6668.	5630.	5386.	5027.	2.089E-04	3722.	1595.	0.	0.	0.	0.
1.905E-04	7570.	6690.	6160.	5662.	1.905E-04	4410.	2139.	43.	0.	0.	0.
1.738E-04	7675.	7166.	6653.	6222.	1.738E-04	5051.	2731.	102.	0.	0.	0.
1.585E-04	7809.	7522.	7119.	6759.	1.585E-04	5690.	3404.	161.	0.	0.	0.
1.445E-04	7974.	7944.	7700.	7405.	1.445E-04	6253.	4143.	333.	0.	0.	0.
1.318E-04	8132.	8422.	8017.	7929.	1.318E-04	6883.	4896.	618.	25.	0.	0.
1.202E-04	8251.	8689.	8301.	8442.	1.202E-04	7424.	5652.	1198.	252.	0.	0.
1.096E-04	8304.	9025.	8678.	8825.	1.096E-04	7963.	6404.	1957.	522.	0.	0.
1.000E-04	8330.	9313.	9185.	9432.	1.000E-04	8543.	7208.	2744.	975.	0.	0.
9.120E-05	8340.	9972.	9988.	10111.	9.120E-05	9146.	8026.	3767.	1508.	50.	0.
8.318E-05	8353.	10016.	10281.	10537.	8.318E-05	9712.	8751.	4688.	2301.	164.	0.
7.586E-05	8357.	10085.	10568.	10961.	7.586E-05	10213.	9470.	5920.	3376.	756.	0.
6.918E-05	8358.	10138.	10941.	11430.	6.918E-05	10735.	10138.	7203.	5209.	1625.	0.
6.310E-05	8358.	10174.	11226.	11713.	6.310E-05	11334.	10815.	8777.	7031.	3217.	178.
5.754E-05	8358.	10195.	11489.	12026.	5.754E-05	11803.	11478.	10163.	8741.	5393.	1491.
5.248E-05	8358.	10207.	11801.	12373.	5.248E-05	12342.	12133.	11811.	10770.	8046.	4583.
4.786E-05	8358.	10209.	12511.	13252.	4.786E-05	12872.	12830.	13307.	12643.	11146.	8461.
4.365E-05	8358.	10212.	12620.	13590.	4.365E-05	13253.	13528.	14878.	14827.	14572.	12403.
3.981E-05	8358.	10216.	12680.	13880.	3.981E-05	13638.	14193.	16134.	16782.	17361.	16218.
3.631E-05	8358.	10216.	12708.	14175.	3.631E-05	14152.	14859.	17479.	18537.	20183.	20512.
3.311E-05	8358.	10216.	12751.	14558.	3.311E-05	14669.	15522.	19023.	20484.	22948.	24146.
3.020E-05	8358.	10216.	12772.	14760.	3.020E-05	15230.	16213.	20318.	22233.	25446.	26879.
2.754E-05	8358.	10216.	12791.	15101.	2.754E-05	15535.	16848.	21636.	23779.	27358.	29068.
2.512E-05	8358.	10216.	12801.	15436.	2.512E-05	15879.	17481.	23077.	25393.	28912.	30770.
2.291E-05	8358.	10216.	12802.	16243.	2.291E-05	16203.	18046.	24351.	26898.	30487.	33551.
2.089E-05	8358.	10216.	12807.	16272.	2.089E-05	16515.	18520.	25569.	28466.	32223.	36140.
1.905E-05	8358.	10216.	12807.	16307.	1.905E-05	16932.	19066.	26549.	29968.	33827.	37925.
1.738E-05	8358.	10216.	12807.	16349.	1.738E-05	17456.	19646.	27361.	31383.	35276.	39251.
1.585E-05	8358.	10216.	12807.	16365.	1.585E-05	18229.	20307.	28157.	32573.	36485.	40006.
1.445E-05	8358.	10216.	12807.	16378.	1.445E-05	18330.	20780.	28962.	33367.	37609.	40590.
1.318E-05	8358.	10216.	12807.	16403.	1.318E-05	18503.	21178.	29699.	34357.	38281.	40861.
1.202E-05	8358.	10216.	12807.	16404.	1.202E-05	18622.	21508.	30434.	34907.	38982.	41330.
1.096E-05	8358.	10216.	12807.	16405.	1.096E-05	18748.	21904.	30947.	35517.	39513.	41695.
1.000E-05	8358.	10216.	12807.	16406.	1.000E-05	18878.	22176.	31680.	35973.	39924.	41867.
9.120E-06	8358.	10216.	12807.	16406.	9.120E-06	19218.	22831.	32161.	36487.	40420.	41991.

8.318E-06	8358.	10216.	12807.	16406.	8.318E-06	19233.	23157.	32862.	36877.	40848.	42159.
7.586E-06	8358.	10216.	12807.	16406.	7.586E-06	19254.	23759.	33404.	37413.	41059.	42171.
6.918E-06	8358.	10216.	12807.	16406.	6.918E-06	19267.	23999.	34098.	37654.	41396.	42193.
6.310E-06	8358.	10216.	12807.	16406.	6.310E-06	19281.	24178.	34512.	38058.	41590.	42278.
5.754E-06	8358.	10216.	12807.	16406.	5.754E-06	19293.	24336.	34896.	38423.	41737.	42285.
5.248E-06	8358.	10216.	12807.	16406.	5.248E-06	19296.	24616.	35207.	38718.	41887.	42289.
4.786E-06	8358.	10216.	12807.	16406.	4.786E-06	19304.	24849.	35558.	39086.	41943.	42405.
4.365E-06	8358.	10216.	12807.	16406.	4.365E-06	19304.	25449.	35919.	39348.	41966.	42409.
3.981E-06	8358.	10216.	12807.	16406.	3.981E-06	19304.	25484.	36325.	39792.	42080.	42446.
3.631E-06	8358.	10216.	12807.	16406.	3.631E-06	19304.	25504.	36902.	40150.	42159.	42478.
3.311E-06	8358.	10216.	12807.	16406.	3.311E-06	19304.	25522.	37163.	40263.	42174.	42478.
3.020E-06	8358.	10216.	12807.	16406.	3.020E-06	19304.	25527.	37223.	40344.	42225.	42478.
2.754E-06	8358.	10216.	12807.	16406.	2.754E-06	19304.	25534.	37328.	40483.	42339.	42478.
2.512E-06	8358.	10216.	12807.	16406.	2.512E-06	19304.	25539.	37490.	40681.	42374.	42478.
2.291E-06	8358.	10216.	12807.	16406.	2.291E-06	19304.	25539.	37898.	41000.	42425.	42478.
2.089E-06	8358.	10216.	12807.	16406.	2.089E-06	19304.	25539.	37997.	41172.	42487.	42478.
1.905E-06	8358.	10216.	12807.	16406.	1.905E-06	19304.	25539.	38080.	41266.	42695.	42478.
1.738E-06	8358.	10216.	12807.	16406.	1.738E-06	19304.	25539.	38211.	41269.	42695.	42478.
1.585E-06	8358.	10216.	12807.	16406.	1.585E-06	19304.	25539.	38298.	41292.	42695.	42478.
1.445E-06	8358.	10216.	12807.	16406.	1.445E-06	19304.	25539.	38448.	41303.	42730.	42478.
1.318E-06	8358.	10216.	12807.	16406.	1.318E-06	19304.	25539.	38691.	41404.	42730.	42478.
1.202E-06	8358.	10216.	12807.	16406.	1.202E-06	19304.	25539.	38745.	41408.	42730.	42478.
1.096E-06	8358.	10216.	12807.	16406.	1.096E-06	19304.	25539.	39093.	41424.	42864.	42478.
1.000E-06	8358.	10216.	12807.	16406.	1.000E-06	19304.	25539.	39093.	41466.	42872.	42478.
9.120E-07	8358.	10216.	12807.	16406.	9.120E-07	19304.	25539.	39094.	41520.	42872.	42478.
8.318E-07	8358.	10216.	12807.	16406.	8.318E-07	19304.	25539.	39135.	41600.	42872.	42478.
7.586E-07	8358.	10216.	12807.	16406.	7.586E-07	19304.	25539.	39135.	41730.	42872.	42478.
6.918E-07	8358.	10216.	12807.	16406.	6.918E-07	19304.	25539.	39135.	41732.	42872.	42478.
6.310E-07	8358.	10216.	12807.	16406.	6.310E-07	19304.	25539.	39135.	41892.	42872.	42478.
5.754E-07	8358.	10216.	12807.	16406.	5.754E-07	19304.	25539.	39135.	41892.	42872.	42478.
5.248E-07	8358.	10216.	12807.	16406.	5.248E-07	19304.	25539.	39135.	41892.	42872.	42478.
4.786E-07	8358.	10216.	12807.	16406.	4.786E-07	19304.	25539.	39135.	41892.	42872.	42478.
4.365E-07	8358.	10216.	12807.	16406.	4.365E-07	19304.	25539.	39135.	41892.	42872.	42478.
3.981E-07	8358.	10216.	12807.	16406.	3.981E-07	19304.	25539.	39135.	41892.	42872.	42478.
3.631E-07	8358.	10216.	12807.	16406.	3.631E-07	19304.	25539.	39135.	41892.	42872.	42478.
3.311E-07	8358.	10216.	12807.	16406.	3.311E-07	19304.	25539.	39135.	41892.	42872.	42478.
3.020E-07	8358.	10216.	12807.	16406.	3.020E-07	19304.	25539.	39135.	41892.	42872.	42478.
2.754E-07	8358.	10216.	12807.	16406.	2.754E-07	19304.	25539.	39135.	41892.	42872.	42478.
2.512E-07	8358.	10216.	12807.	16406.	2.512E-07	19304.	25539.	39135.	41892.	42872.	42478.
2.291E-07	8358.	10216.	12807.	16406.	2.291E-07	19304.	25539.	39135.	41892.	42872.	42478.
2.089E-07	8358.	10216.	12807.	16406.	2.089E-07	19304.	25539.	39135.	41892.	42872.	42478.
1.905E-07	8358.	10216.	12807.	16406.	1.905E-07	19304.	25539.	39135.	41892.	42872.	42478.
1.738E-07	8358.	10216.	12807.	16406.	1.738E-07	19304.	25539.	39135.	41892.	42872.	42478.
1.585E-07	8358.	10216.	12807.	16406.	1.585E-07	19304.	25539.	39135.	41892.	42872.	42478.
1.445E-07	8358.	10216.	12807.	16406.	1.445E-07	19304.	25539.	39135.	41892.	42872.	42478.
1.318E-07	8358.	10216.	12807.	16406.	1.318E-07	19304.	25539.	39135.	41892.	42872.	42478.
1.202E-07	8358.	10216.	12807.	16406.	1.202E-07	19304.	25539.	39135.	41892.	42872.	42478.
1.096E-07	8358.	10216.	12807.	16406.	1.096E-07	19304.	25539.	39135.	41892.	42872.	42478.
1.000E-07	8358.	10216.	12807.	16406.	1.000E-07	19304.	25539.	39135.	41892.	42872.	42478.
Belw. Lim.	0.	0.	0.	0.	Belw. Lim.	0.	0.	0.	0.	0.	0.

Program Title: ARCON96.

Developed For: U.S. Nuclear Regulatory Commission
Office of Nuclear Reactor Regulation
Division of Reactor Program Management

Date: June 25, 1997 11:00 a.m.

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Code Documentation: NUREG/CR-6331 Rev. 1

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Program Run 9/ 9/2004 at 11:37:56

******* ARCON INPUT **********

Number of Meteorological Data Files = 5
Meteorological Data File Names
C:\TRACI'~1\PEACHB~1\BYRON\QDC95R1A.MET
C:\TRACI'~1\PEACHB~1\BYRON\QDC96R1A.MET
C:\TRACI'~1\PEACHB~1\BYRON\QDC97R1A.MET
C:\TRACI'~1\PEACHB~1\BYRON\QDC98R1A.MET
C:\TRACI'~1\PEACHB~1\BYRON\QDC99R1A.MET

Height of lower wind instrument (m) = 10.1
Height of upper wind instrument (m) = 59.7
Wind speeds entered as miles per hour

Ground-level release
Release height (m) = .0
Building Area (m^2) = 3077.6
Effluent vertical velocity (m/s) = .00
Vent or stack flow (m^3/s) = .00
Vent or stack radius (m) = .00

Direction .. intake to source (deg) = 017
Wind direction sector width (deg) = 90
Wind direction window (deg) = 332 - 062
Distance to intake (m) = 121.5

Intake height (m) = 8.8
Terrain elevation difference (m) = .0

Output file names
3QDC.log
3QDC.cfd

Minimum Wind Speed (m/s) = .5
Surface roughness length (m) = .20
Sector averaging constant = 4.3

Initial value of sigma y = .00
Initial value of sigma z = .00

Expanded output for code testing not selected

Total number of hours of data processed = 43824
Hours of missing data = 344
Hours direction in window = 7712
Hours elevated plume w/ dir. in window = 0
Hours of calm winds = 646
Hours direction not in window or calm = 35122

DISTRIBUTION SUMMARY DATA BY AVERAGING INTERVAL

AVER. PER.	1	2	4	8	12	24	96	168	360	720
UPPER LIM.	1.00E-03	1.00E-03	1.00E-03	1.00E-03	1.00E-03	1.00E-03	1.00E-03	1.00E-03	1.00E-03	1.00E-03
LOW LIM.	1.00E-07	1.00E-07	1.00E-07	1.00E-07	1.00E-07	1.00E-07	1.00E-07	1.00E-07	1.00E-07	1.00E-07
ABOVE RANGE	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
IN RANGE	8358.	10216.	12807.	16406.	19304.	25539.	39135.	41892.	42872.	42478.
BELOW RANGE	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
ZERO	35122.	33224.	30553.	26794.	23945.	17586.	3562.	721.	0.	0.
TOTAL X/Qs	43480.	43440.	43360.	43200.	43249.	43125.	42697.	42613.	42872.	42478.
% NON ZERO	19.22	23.52	29.54	37.98	44.63	59.22	91.66	98.31	100.00	100.00

95th PERCENTILE X/Q VALUES

3.88E-04	3.77E-04	3.56E-04	3.22E-04	2.63E-04	1.90E-04	1.07E-04	8.49E-05	6.72E-05	5.65E-05

95% X/Q for standard averaging intervals

0 to 2 hours	3.88E-04
2 to 8 hours	3.00E-04
8 to 24 hours	1.24E-04
1 to 4 days	7.99E-05
4 to 30 days	4.87E-05

HOURLY VALUE RANGE

	MAX X/Q	MIN X/Q
CENTERLINE	5.35E-04	7.28E-05
SECTOR-AVERAGE	3.12E-04	4.24E-05

NORMAL PROGRAM COMPLETION

Unit 2 MSIV to Control Room Intake (Reactor Building Area)

```
5
C:\TRACI'~1\PEACHB~1\BYRON\QDC95R1A.MET
C:\TRACI'~1\PEACHB~1\BYRON\QDC96R1A.MET
C:\TRACI'~1\PEACHB~1\BYRON\QDC97R1A.MET
C:\TRACI'~1\PEACHB~1\BYRON\QDC98R1A.MET
C:\TRACI'~1\PEACHB~1\BYRON\QDC99R1A.MET
   10.06
   59.74
  2
  1
    0.00
  2639.00
    0.00
    0.00
    0.00
  17  90
   121.50
    8.80
    0.00
4QDC.log
4QDC.cfd
 .2
    0.50
    4.30
  1  2  4  8  12  24  96 168 360 720
  1  2  4  8  11  22  87 152 324 648
    0.00    0.00
n
```

X/Q CUMULATIVE FREQUENCY DISTRIBUTIONS

XOQ	1	2	4	8	XOQ	12	24	96	168	360	720
Abv. Lim.	0.	0.	0.	0.	Abv. Lim.	0.	0.	0.	0.	0.	0.
9.120E-04	0.	0.	0.	0.	9.120E-04	0.	0.	0.	0.	0.	0.
8.318E-04	0.	0.	0.	0.	8.318E-04	0.	0.	0.	0.	0.	0.
7.586E-04	0.	0.	0.	0.	7.586E-04	0.	0.	0.	0.	0.	0.
6.918E-04	0.	0.	0.	0.	6.918E-04	0.	0.	0.	0.	0.	0.
6.310E-04	0.	0.	0.	0.	6.310E-04	0.	0.	0.	0.	0.	0.
5.754E-04	0.	0.	0.	0.	5.754E-04	0.	0.	0.	0.	0.	0.
5.248E-04	1.	0.	0.	0.	5.248E-04	0.	0.	0.	0.	0.	0.
4.786E-04	4.	0.	0.	0.	4.786E-04	0.	0.	0.	0.	0.	0.
4.365E-04	456.	265.	154.	64.	4.365E-04	0.	0.	0.	0.	0.	0.
3.981E-04	1732.	1394.	962.	536.	3.981E-04	0.	0.	0.	0.	0.	0.
3.631E-04	3328.	2697.	2034.	1324.	3.631E-04	67.	0.	0.	0.	0.	0.
3.311E-04	4157.	3502.	2664.	1979.	3.311E-04	631.	0.	0.	0.	0.	0.
3.020E-04	4712.	4020.	3250.	2556.	3.020E-04	1242.	0.	0.	0.	0.	0.
2.754E-04	5487.	4487.	3948.	3209.	2.754E-04	1851.	226.	0.	0.	0.	0.
2.512E-04	5940.	4849.	4455.	3793.	2.512E-04	2447.	595.	0.	0.	0.	0.
2.291E-04	6232.	5188.	4902.	4451.	2.291E-04	3068.	1041.	0.	0.	0.	0.
2.089E-04	6671.	5633.	5388.	5030.	2.089E-04	3727.	1606.	0.	0.	0.	0.
1.905E-04	7570.	6697.	6162.	5667.	1.905E-04	4413.	2147.	43.	0.	0.	0.
1.738E-04	7676.	7166.	6654.	6223.	1.738E-04	5057.	2734.	103.	0.	0.	0.
1.585E-04	7809.	7523.	7120.	6762.	1.585E-04	5693.	3413.	162.	0.	0.	0.
1.445E-04	7974.	7944.	7700.	7406.	1.445E-04	6257.	4147.	336.	0.	0.	0.
1.318E-04	8132.	8425.	8017.	7932.	1.318E-04	6884.	4900.	621.	25.	0.	0.
1.202E-04	8251.	8689.	8301.	8445.	1.202E-04	7430.	5657.	1231.	252.	0.	0.
1.096E-04	8304.	9025.	8678.	8827.	1.096E-04	7964.	6410.	1959.	526.	0.	0.
1.000E-04	8330.	9313.	9185.	9433.	1.000E-04	8546.	7213.	2747.	981.	0.	0.
9.120E-05	8340.	9972.	9988.	10112.	9.120E-05	9147.	8032.	3776.	1515.	50.	0.
8.318E-05	8353.	10016.	10281.	10545.	8.318E-05	9712.	8757.	4700.	2307.	167.	0.
7.586E-05	8357.	10085.	10568.	10962.	7.586E-05	10215.	9476.	5925.	3383.	759.	0.
6.918E-05	8358.	10138.	10941.	11430.	6.918E-05	10736.	10146.	7209.	5216.	1643.	0.
6.310E-05	8358.	10174.	11227.	11713.	6.310E-05	11335.	10816.	8793.	7064.	3238.	231.
5.754E-05	8358.	10195.	11489.	12026.	5.754E-05	11811.	11483.	10170.	8752.	5435.	1493.
5.248E-05	8358.	10207.	11801.	12373.	5.248E-05	12342.	12135.	11819.	10783.	8119.	4602.
4.786E-05	8358.	10209.	12512.	13253.	4.786E-05	12873.	12840.	13315.	12691.	11170.	8485.
4.365E-05	8358.	10212.	12620.	13590.	4.365E-05	13253.	13529.	14889.	14880.	14582.	12417.
3.981E-05	8358.	10216.	12680.	13880.	3.981E-05	13639.	14195.	16140.	16791.	17384.	16230.
3.631E-05	8358.	10216.	12708.	14175.	3.631E-05	14153.	14860.	17487.	18551.	20192.	20540.
3.311E-05	8358.	10216.	12751.	14558.	3.311E-05	14669.	15524.	19031.	20494.	22958.	24159.
3.020E-05	8358.	10216.	12772.	14760.	3.020E-05	15230.	16214.	20322.	22249.	25540.	26911.
2.754E-05	8358.	10216.	12791.	15101.	2.754E-05	15537.	16849.	21638.	23784.	27362.	29077.
2.512E-05	8358.	10216.	12801.	15436.	2.512E-05	15879.	17482.	23090.	25398.	28919.	30790.
2.291E-05	8358.	10216.	12802.	16243.	2.291E-05	16203.	18047.	24365.	26902.	30527.	33562.
2.089E-05	8358.	10216.	12807.	16272.	2.089E-05	16520.	18523.	25617.	28468.	32225.	36148.
1.905E-05	8358.	10216.	12807.	16307.	1.905E-05	16932.	19067.	26549.	29970.	33827.	37928.
1.738E-05	8358.	10216.	12807.	16349.	1.738E-05	17458.	19646.	27363.	31383.	35336.	39252.
1.585E-05	8358.	10216.	12807.	16365.	1.585E-05	18229.	20308.	28158.	32575.	36485.	40007.
1.445E-05	8358.	10216.	12807.	16378.	1.445E-05	18330.	20780.	28963.	33367.	37610.	40590.
1.318E-05	8358.	10216.	12807.	16403.	1.318E-05	18504.	21179.	29699.	34360.	38281.	40861.
1.202E-05	8358.	10216.	12807.	16404.	1.202E-05	18622.	21508.	30434.	34914.	38982.	41330.
1.096E-05	8358.	10216.	12807.	16405.	1.096E-05	18748.	21904.	30948.	35517.	39513.	41695.
1.000E-05	8358.	10216.	12807.	16406.	1.000E-05	18878.	22176.	31681.	35977.	39925.	41867.
9.120E-06	8358.	10216.	12807.	16406.	9.120E-06	19218.	22833.	32161.	36487.	40421.	41991.

8.318E-06	8358.	10216.	12807.	16406.	8.318E-06	19233.	23157.	32863.	36877.	40848.	42159.
7.586E-06	8358.	10216.	12807.	16406.	7.586E-06	19254.	23760.	33404.	37413.	41059.	42171.
6.918E-06	8358.	10216.	12807.	16406.	6.918E-06	19267.	24000.	34098.	37673.	41396.	42193.
6.310E-06	8358.	10216.	12807.	16406.	6.310E-06	19281.	24178.	34512.	38058.	41590.	42278.
5.754E-06	8358.	10216.	12807.	16406.	5.754E-06	19293.	24336.	34896.	38444.	41737.	42285.
5.248E-06	8358.	10216.	12807.	16406.	5.248E-06	19296.	24616.	35207.	38718.	41887.	42289.
4.786E-06	8358.	10216.	12807.	16406.	4.786E-06	19304.	24849.	35558.	39087.	41943.	42405.
4.365E-06	8358.	10216.	12807.	16406.	4.365E-06	19304.	25449.	35919.	39348.	41966.	42409.
3.981E-06	8358.	10216.	12807.	16406.	3.981E-06	19304.	25484.	36325.	39792.	42080.	42446.
3.631E-06	8358.	10216.	12807.	16406.	3.631E-06	19304.	25504.	36902.	40150.	42159.	42478.
3.311E-06	8358.	10216.	12807.	16406.	3.311E-06	19304.	25522.	37163.	40263.	42174.	42478.
3.020E-06	8358.	10216.	12807.	16406.	3.020E-06	19304.	25527.	37223.	40344.	42225.	42478.
2.754E-06	8358.	10216.	12807.	16406.	2.754E-06	19304.	25534.	37328.	40483.	42339.	42478.
2.512E-06	8358.	10216.	12807.	16406.	2.512E-06	19304.	25539.	37490.	40681.	42374.	42478.
2.291E-06	8358.	10216.	12807.	16406.	2.291E-06	19304.	25539.	37898.	41000.	42425.	42478.
2.089E-06	8358.	10216.	12807.	16406.	2.089E-06	19304.	25539.	37997.	41172.	42487.	42478.
1.905E-06	8358.	10216.	12807.	16406.	1.905E-06	19304.	25539.	38080.	41266.	42695.	42478.
1.738E-06	8358.	10216.	12807.	16406.	1.738E-06	19304.	25539.	38211.	41269.	42695.	42478.
1.585E-06	8358.	10216.	12807.	16406.	1.585E-06	19304.	25539.	38298.	41292.	42695.	42478.
1.445E-06	8358.	10216.	12807.	16406.	1.445E-06	19304.	25539.	38448.	41303.	42730.	42478.
1.318E-06	8358.	10216.	12807.	16406.	1.318E-06	19304.	25539.	38691.	41404.	42730.	42478.
1.202E-06	8358.	10216.	12807.	16406.	1.202E-06	19304.	25539.	38745.	41408.	42730.	42478.
1.096E-06	8358.	10216.	12807.	16406.	1.096E-06	19304.	25539.	39093.	41424.	42864.	42478.
1.000E-06	8358.	10216.	12807.	16406.	1.000E-06	19304.	25539.	39093.	41466.	42872.	42478.
9.120E-07	8358.	10216.	12807.	16406.	9.120E-07	19304.	25539.	39094.	41520.	42872.	42478.
8.318E-07	8358.	10216.	12807.	16406.	8.318E-07	19304.	25539.	39135.	41600.	42872.	42478.
7.586E-07	8358.	10216.	12807.	16406.	7.586E-07	19304.	25539.	39135.	41730.	42872.	42478.
6.918E-07	8358.	10216.	12807.	16406.	6.918E-07	19304.	25539.	39135.	41732.	42872.	42478.
6.310E-07	8358.	10216.	12807.	16406.	6.310E-07	19304.	25539.	39135.	41892.	42872.	42478.
5.754E-07	8358.	10216.	12807.	16406.	5.754E-07	19304.	25539.	39135.	41892.	42872.	42478.
5.248E-07	8358.	10216.	12807.	16406.	5.248E-07	19304.	25539.	39135.	41892.	42872.	42478.
4.786E-07	8358.	10216.	12807.	16406.	4.786E-07	19304.	25539.	39135.	41892.	42872.	42478.
4.365E-07	8358.	10216.	12807.	16406.	4.365E-07	19304.	25539.	39135.	41892.	42872.	42478.
3.981E-07	8358.	10216.	12807.	16406.	3.981E-07	19304.	25539.	39135.	41892.	42872.	42478.
3.631E-07	8358.	10216.	12807.	16406.	3.631E-07	19304.	25539.	39135.	41892.	42872.	42478.
3.311E-07	8358.	10216.	12807.	16406.	3.311E-07	19304.	25539.	39135.	41892.	42872.	42478.
3.020E-07	8358.	10216.	12807.	16406.	3.020E-07	19304.	25539.	39135.	41892.	42872.	42478.
2.754E-07	8358.	10216.	12807.	16406.	2.754E-07	19304.	25539.	39135.	41892.	42872.	42478.
2.512E-07	8358.	10216.	12807.	16406.	2.512E-07	19304.	25539.	39135.	41892.	42872.	42478.
2.291E-07	8358.	10216.	12807.	16406.	2.291E-07	19304.	25539.	39135.	41892.	42872.	42478.
2.089E-07	8358.	10216.	12807.	16406.	2.089E-07	19304.	25539.	39135.	41892.	42872.	42478.
1.905E-07	8358.	10216.	12807.	16406.	1.905E-07	19304.	25539.	39135.	41892.	42872.	42478.
1.738E-07	8358.	10216.	12807.	16406.	1.738E-07	19304.	25539.	39135.	41892.	42872.	42478.
1.585E-07	8358.	10216.	12807.	16406.	1.585E-07	19304.	25539.	39135.	41892.	42872.	42478.
1.445E-07	8358.	10216.	12807.	16406.	1.445E-07	19304.	25539.	39135.	41892.	42872.	42478.
1.318E-07	8358.	10216.	12807.	16406.	1.318E-07	19304.	25539.	39135.	41892.	42872.	42478.
1.202E-07	8358.	10216.	12807.	16406.	1.202E-07	19304.	25539.	39135.	41892.	42872.	42478.
1.096E-07	8358.	10216.	12807.	16406.	1.096E-07	19304.	25539.	39135.	41892.	42872.	42478.
1.000E-07	8358.	10216.	12807.	16406.	1.000E-07	19304.	25539.	39135.	41892.	42872.	42478.
Belw. Lim.	0.	0.	0.	0.	Belw. Lim.	0.	0.	0.	0.	0.	0.

Program Title: ARCON96.

Developed For: U.S. Nuclear Regulatory Commission
Office of Nuclear Reactor Regulation
Division of Reactor Program Management

Date: June 25, 1997 11:00 a.m.

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Code Documentation: NUREG/CR-6331 Rev. 1

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Program Run 9/ 9/2004 at 11:39:05

******* ARCON INPUT **********

Number of Meteorological Data Files = 5
Meteorological Data File Names
C:\TRACI'~1\PEACHB~1\BYRON\QDC95R1A.MET
C:\TRACI'~1\PEACHB~1\BYRON\QDC96R1A.MET
C:\TRACI'~1\PEACHB~1\BYRON\QDC97R1A.MET
C:\TRACI'~1\PEACHB~1\BYRON\QDC98R1A.MET
C:\TRACI'~1\PEACHB~1\BYRON\QDC99R1A.MET

Height of lower wind instrument (m) = 10.1
Height of upper wind instrument (m) = 59.7
Wind speeds entered as miles per hour

Ground-level release
Release height (m) = .0
Building Area (m^2) = 2639.0
Effluent vertical velocity (m/s) = .00
Vent or stack flow (m^3/s) = .00
Vent or stack radius (m) = .00

Direction .. intake to source (deg) = 017
Wind direction sector width (deg) = 90
Wind direction window (deg) = 332 - 062
Distance to intake (m) = 121.5

Intake height (m) = 8.8
Terrain elevation difference (m) = .0

Output file names
4QDC.log
4QDC.cfd

Minimum Wind Speed (m/s) = .5
Surface roughness length (m) = .20
Sector averaging constant = 4.3

Initial value of sigma y = .00
Initial value of sigma z = .00

Expanded output for code testing not selected

Total number of hours of data processed = 43824
Hours of missing data = 344
Hours direction in window = 7712
Hours elevated plume w/ dir. in window = 0
Hours of calm winds = 646
Hours direction not in window or calm = 35122

DISTRIBUTION SUMMARY DATA BY AVERAGING INTERVAL

AVER. PER.	1	2	4	8	12	24	96	168	360	720
UPPER LIM.	1.00E-03	1.00E-03	1.00E-03	1.00E-03	1.00E-03	1.00E-03	1.00E-03	1.00E-03	1.00E-03	1.00E-03
LOW LIM.	1.00E-07	1.00E-07	1.00E-07	1.00E-07	1.00E-07	1.00E-07	1.00E-07	1.00E-07	1.00E-07	1.00E-07
ABOVE RANGE	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
IN RANGE	8358.	10216.	12807.	16406.	19304.	25539.	39135.	41892.	42872.	42478.
BELOW RANGE	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
ZERO	35122.	33224.	30553.	26794.	23945.	17586.	3562.	721.	0.	0.
TOTAL X/Qs	43480.	43440.	43360.	43200.	43249.	43125.	42697.	42613.	42872.	42478.
% NON ZERO	19.22	23.52	29.54	37.98	44.63	59.22	91.66	98.31	100.00	100.00

95th PERCENTILE X/Q VALUES

3.88E-04	3.77E-04	3.56E-04	3.22E-04	2.63E-04	1.90E-04	1.07E-04	8.50E-05	6.73E-05	5.65E-05

95% X/Q for standard averaging intervals

0 to 2 hours	3.88E-04
2 to 8 hours	3.00E-04
8 to 24 hours	1.24E-04
1 to 4 days	7.99E-05
4 to 30 days	4.87E-05

HOURLY VALUE RANGE

	MAX X/Q	MIN X/Q
CENTERLINE	5.36E-04	7.29E-05
SECTOR-AVERAGE	3.13E-04	4.25E-05

NORMAL PROGRAM COMPLETION

Station Chimney to Control Room Intake (No Stack Downwash)

```
5
C:\TRACI'~1\PEACHB~1\BYRON\QDC95R1B.MET
C:\TRACI'~1\PEACHB~1\BYRON\QDC96R1B.MET
C:\TRACI'~1\PEACHB~1\BYRON\QDC97R1B.MET
C:\TRACI'~1\PEACHB~1\BYRON\QDC98R1B.MET
C:\TRACI'~1\PEACHB~1\BYRON\QDC99R1B.MET
   10.06
   90.22
  2
  3
   94.60
 3000.40
   0.00
   0.00
   0.00
 344  90
  127.10
   8.80
   0.00
5QDC.log
5QDC.cfd
 .2
   0.50
   4.30
  1  2  4  8  12  24  96 168 360 720
  1  2  4  8  11  22  87 152 324 648
   0.00   0.00
n
```

X/Q CUMULATIVE FREQUENCY DISTRIBUTIONS

XOQ	1	2	4	8	XOQ	12	24	96	168	360	720
Abv. Lim.	17.	7.	1.	0.	Abv. Lim.	0.	0.	0.	0.	0.	0.
9.120E-10	18.	4.	4.	0.	9.120E-10	0.	0.	0.	0.	0.	0.
8.318E-10	35.	12.	6.	0.	8.318E-10	0.	0.	0.	0.	0.	0.
7.586E-10	51.	24.	12.	2.	7.586E-10	0.	0.	0.	0.	0.	0.
6.918E-10	81.	41.	18.	3.	6.918E-10	0.	0.	0.	0.	0.	0.
6.310E-10	117.	62.	27.	4.	6.310E-10	0.	0.	0.	0.	0.	0.
5.754E-10	156.	94.	55.	5.	5.754E-10	0.	0.	0.	0.	0.	0.
5.248E-10	234.	144.	82.	8.	5.248E-10	2.	0.	0.	0.	0.	0.
4.786E-10	303.	212.	118.	24.	4.786E-10	4.	0.	0.	0.	0.	0.
4.365E-10	348.	270.	166.	48.	4.365E-10	5.	0.	0.	0.	0.	0.
3.981E-10	419.	327.	220.	70.	3.981E-10	7.	0.	0.	0.	0.	0.
3.631E-10	468.	379.	268.	95.	3.631E-10	7.	0.	0.	0.	0.	0.
3.311E-10	511.	420.	310.	136.	3.311E-10	26.	0.	0.	0.	0.	0.
3.020E-10	539.	475.	371.	196.	3.020E-10	52.	0.	0.	0.	0.	0.
2.754E-10	555.	533.	441.	272.	2.754E-10	72.	0.	0.	0.	0.	0.
2.512E-10	566.	591.	510.	346.	2.512E-10	114.	3.	0.	0.	0.	0.
2.291E-10	570.	632.	569.	419.	2.291E-10	160.	5.	0.	0.	0.	0.
2.089E-10	571.	673.	636.	533.	2.089E-10	215.	7.	0.	0.	0.	0.
1.905E-10	571.	718.	684.	616.	1.905E-10	311.	8.	0.	0.	0.	0.
1.738E-10	571.	751.	743.	679.	1.738E-10	398.	12.	0.	0.	0.	0.
1.585E-10	571.	774.	800.	755.	1.585E-10	498.	28.	0.	0.	0.	0.
1.445E-10	571.	788.	847.	856.	1.445E-10	599.	69.	0.	0.	0.	0.
1.318E-10	571.	802.	920.	964.	1.318E-10	720.	102.	0.	0.	0.	0.
1.202E-10	571.	808.	991.	1079.	1.202E-10	827.	147.	0.	0.	0.	0.
1.096E-10	571.	810.	1020.	1151.	1.096E-10	902.	201.	0.	0.	0.	0.
1.000E-10	571.	810.	1085.	1234.	1.000E-10	1017.	310.	0.	0.	0.	0.
9.120E-11	571.	810.	1122.	1311.	9.120E-11	1172.	476.	0.	0.	0.	0.
8.318E-11	571.	810.	1160.	1376.	8.318E-11	1305.	634.	0.	0.	0.	0.
7.586E-11	571.	810.	1180.	1454.	7.586E-11	1402.	784.	7.	0.	0.	0.
6.918E-11	571.	810.	1198.	1536.	6.918E-11	1526.	978.	14.	0.	0.	0.
6.310E-11	571.	810.	1206.	1634.	6.310E-11	1603.	1212.	53.	0.	0.	0.
5.754E-11	571.	810.	1209.	1698.	5.754E-11	1712.	1394.	66.	4.	0.	0.
5.248E-11	571.	810.	1213.	1779.	5.248E-11	1815.	1640.	120.	14.	0.	0.
4.786E-11	571.	810.	1213.	1839.	4.786E-11	1920.	1880.	214.	30.	0.	0.
4.365E-11	571.	810.	1213.	1887.	4.365E-11	2007.	2091.	282.	46.	0.	0.
3.981E-11	571.	810.	1213.	1913.	3.981E-11	2127.	2414.	427.	58.	0.	0.
3.631E-11	571.	810.	1213.	1945.	3.631E-11	2194.	2631.	546.	186.	0.	0.
3.311E-11	571.	810.	1213.	1969.	3.311E-11	2311.	2780.	775.	344.	6.	0.
3.020E-11	571.	810.	1213.	1975.	3.020E-11	2379.	2962.	1077.	486.	20.	0.
2.754E-11	571.	810.	1213.	1983.	2.754E-11	2457.	3145.	1479.	715.	66.	0.
2.512E-11	571.	810.	1213.	1983.	2.512E-11	2521.	3373.	1690.	922.	229.	4.
2.291E-11	571.	810.	1213.	1983.	2.291E-11	2598.	3578.	2282.	1292.	386.	39.
2.089E-11	571.	810.	1213.	1983.	2.089E-11	2622.	3701.	2603.	1564.	567.	50.
1.905E-11	571.	810.	1213.	1983.	1.905E-11	2665.	3828.	3043.	1863.	800.	329.
1.738E-11	571.	810.	1213.	1983.	1.738E-11	2695.	3996.	3650.	2632.	1281.	552.
1.585E-11	571.	810.	1213.	1983.	1.585E-11	2709.	4111.	4327.	3395.	2133.	719.
1.445E-11	571.	810.	1213.	1983.	1.445E-11	2719.	4208.	5012.	3795.	3111.	1389.
1.318E-11	571.	810.	1213.	1983.	1.318E-11	2736.	4341.	5483.	4622.	4039.	2057.
1.202E-11	571.	810.	1213.	1983.	1.202E-11	2741.	4485.	6323.	5307.	4705.	2934.
1.096E-11	571.	810.	1213.	1983.	1.096E-11	2747.	4568.	7092.	6092.	5696.	4327.
1.000E-11	571.	810.	1213.	1983.	1.000E-11	2747.	4676.	7606.	7115.	6602.	6040.
9.120E-12	571.	810.	1213.	1983.	9.120E-12	2747.	4740.	8047.	8104.	7624.	7598.

8.318E-12	571.	810.	1213.	1983.	8.318E-12	2747.	4799.	8382.	8853.	9103.	8950.
7.586E-12	571.	810.	1213.	1983.	7.586E-12	2747.	4819.	8695.	9350.	9807.	9936.
6.918E-12	571.	810.	1213.	1983.	6.918E-12	2747.	4854.	9202.	10468.	10226.	11632.
6.310E-12	571.	810.	1213.	1983.	6.310E-12	2747.	4891.	9865.	11502.	11462.	12702.
5.754E-12	571.	810.	1213.	1983.	5.754E-12	2747.	4894.	10227.	11924.	12238.	13873.
5.248E-12	571.	810.	1213.	1983.	5.248E-12	2747.	4910.	10455.	12398.	13452.	14847.
4.786E-12	571.	810.	1213.	1983.	4.786E-12	2747.	4910.	10642.	12798.	14036.	16122.
4.365E-12	571.	810.	1213.	1983.	4.365E-12	2747.	4910.	11086.	13265.	15099.	16990.
3.981E-12	571.	810.	1213.	1983.	3.981E-12	2747.	4910.	11203.	13866.	16181.	17936.
3.631E-12	571.	810.	1213.	1983.	3.631E-12	2747.	4910.	11238.	14771.	16835.	18394.
3.311E-12	571.	810.	1213.	1983.	3.311E-12	2747.	4910.	11717.	15023.	17506.	18806.
3.020E-12	571.	810.	1213.	1983.	3.020E-12	2747.	4910.	12157.	15345.	17914.	19812.
2.754E-12	571.	810.	1213.	1983.	2.754E-12	2747.	4910.	12394.	15495.	18361.	20219.
2.512E-12	571.	810.	1213.	1983.	2.512E-12	2747.	4910.	12725.	15991.	19337.	20594.
2.291E-12	571.	810.	1213.	1983.	2.291E-12	2747.	4910.	12982.	16082.	20149.	21913.
2.089E-12	571.	810.	1213.	1983.	2.089E-12	2747.	4910.	13148.	16112.	20387.	22241.
1.905E-12	571.	810.	1213.	1983.	1.905E-12	2747.	4910.	13221.	16861.	21085.	22860.
1.738E-12	571.	810.	1213.	1983.	1.738E-12	2747.	4910.	13329.	17414.	22013.	23926.
1.585E-12	571.	810.	1213.	1983.	1.585E-12	2747.	4910.	13352.	17696.	22245.	24240.
1.445E-12	571.	810.	1213.	1983.	1.445E-12	2747.	4910.	13354.	18154.	22284.	24557.
1.318E-12	571.	810.	1213.	1983.	1.318E-12	2747.	4910.	13375.	18554.	22794.	25551.
1.202E-12	571.	810.	1213.	1983.	1.202E-12	2747.	4910.	13375.	18617.	23272.	26050.
1.096E-12	571.	810.	1213.	1983.	1.096E-12	2747.	4910.	13375.	18769.	23631.	26929.
1.000E-12	571.	810.	1213.	1983.	1.000E-12	2747.	4910.	13375.	19001.	23634.	27391.
9.120E-13	571.	810.	1213.	1983.	9.120E-13	2747.	4910.	13375.	19003.	23724.	27885.
8.318E-13	571.	810.	1213.	1983.	8.318E-13	2747.	4910.	13375.	19003.	25049.	28367.
7.586E-13	571.	810.	1213.	1983.	7.586E-13	2747.	4910.	13375.	19024.	25115.	28557.
6.918E-13	573.	810.	1213.	1983.	6.918E-13	2747.	4910.	13375.	19024.	25567.	29097.
6.310E-13	574.	811.	1213.	1983.	6.310E-13	2747.	4910.	13375.	19024.	26554.	29099.
5.754E-13	576.	811.	1213.	1983.	5.754E-13	2747.	4910.	13375.	19024.	26605.	30154.
5.248E-13	582.	812.	1213.	1983.	5.248E-13	2747.	4910.	13375.	19024.	26677.	30163.
4.786E-13	584.	813.	1213.	1983.	4.786E-13	2747.	4910.	13375.	19024.	26861.	30163.
4.365E-13	594.	816.	1213.	1983.	4.365E-13	2747.	4910.	13375.	19024.	26861.	30717.
3.981E-13	611.	820.	1214.	1983.	3.981E-13	2747.	4910.	13375.	19024.	26861.	31403.
3.631E-13	635.	835.	1216.	1983.	3.631E-13	2747.	4910.	13375.	19024.	26861.	31641.
3.311E-13	651.	841.	1220.	1983.	3.311E-13	2747.	4910.	13375.	19024.	26861.	32398.
3.020E-13	675.	849.	1223.	1983.	3.020E-13	2747.	4910.	13375.	19024.	26861.	32864.
2.754E-13	702.	862.	1233.	1983.	2.754E-13	2747.	4910.	13375.	19024.	26861.	32865.
2.512E-13	742.	876.	1234.	1983.	2.512E-13	2747.	4910.	13375.	19024.	26861.	33049.
2.291E-13	778.	899.	1239.	1987.	2.291E-13	2747.	4910.	13375.	19024.	26861.	33049.
2.089E-13	828.	924.	1245.	1987.	2.089E-13	2747.	4910.	13375.	19024.	26861.	33049.
1.905E-13	878.	961.	1261.	1989.	1.905E-13	2747.	4910.	13375.	19024.	26861.	33049.
1.738E-13	928.	997.	1287.	2000.	1.738E-13	2747.	4910.	13375.	19024.	26861.	33049.
1.585E-13	981.	1035.	1306.	2009.	1.585E-13	2751.	4910.	13375.	19024.	26861.	33049.
1.445E-13	1027.	1085.	1323.	2011.	1.445E-13	2752.	4910.	13375.	19024.	26861.	33049.
1.318E-13	1047.	1110.	1350.	2032.	1.318E-13	2753.	4910.	13375.	19024.	26861.	33049.
1.202E-13	1074.	1154.	1382.	2040.	1.202E-13	2760.	4910.	13375.	19024.	26861.	33049.
1.096E-13	1096.	1200.	1424.	2050.	1.096E-13	2768.	4910.	13375.	19024.	26861.	33049.
1.000E-13	1107.	1238.	1465.	2078.	1.000E-13	2777.	4910.	13375.	19024.	26861.	33049.
Belw. Lim.	30.	285.	733.	1364.	Belw. Lim.	1898.	3091.	6319.	7331.	6700.	4556.

Program Title: ARCON96.

Developed For: U.S. Nuclear Regulatory Commission
Office of Nuclear Reactor Regulation
Division of Reactor Program Management

Date: June 25, 1997 11:00 a.m.

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Code Documentation: NUREG/CR-6331 Rev. 1

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Program Run 9/ 9/2004 at 13:07:05

******* ARCON INPUT **********

Number of Meteorological Data Files = 5
Meteorological Data File Names
C:\TRACI'~1\PEACHB~1\BYRON\QDC95R1B.MET
C:\TRACI'~1\PEACHB~1\BYRON\QDC96R1B.MET
C:\TRACI'~1\PEACHB~1\BYRON\QDC97R1B.MET
C:\TRACI'~1\PEACHB~1\BYRON\QDC98R1B.MET
C:\TRACI'~1\PEACHB~1\BYRON\QDC99R1B.MET

Height of lower wind instrument (m) = 10.1
Height of upper wind instrument (m) = 90.2
Wind speeds entered as miles per hour

Elevated release
Release height (m) = 94.6
Building Area (m^2) = 3000.4
Effluent vertical velocity (m/s) = .00
Vent or stack flow (m^3/s) = .00
Vent or stack radius (m) = .00

Direction .. intake to source (deg) = 344
Wind direction sector width (deg) = 90
Wind direction window (deg) = 299 - 029
Distance to intake (m) = 127.1

Intake height (m) = 8.8
Terrain elevation difference (m) = .0

Output file names
5QDC.log
5QDC.cfd

Minimum Wind Speed (m/s) = .5
Surface roughness length (m) = .20
Sector averaging constant = 4.3

Initial value of sigma y = .00
Initial value of sigma z = .00

Expanded output for code testing not selected

Total number of hours of data processed = 43824
Hours of missing data = 430
Hours direction in window = 10373
Hours elevated plume w/ dir. in window = 696
Hours of calm winds = 8
Hours direction not in window or calm = 33013

DISTRIBUTION SUMMARY DATA BY AVERAGING INTERVAL

AVER. PER.	1	2	4	8	12	24	96	168	360	720
UPPER LIM.	1.00E-09	1.00E-09	1.00E-09	1.00E-09	1.00E-09	1.00E-09	1.00E-09	1.00E-09	1.00E-09	1.00E-09
LOW LIM.	1.00E-13	1.00E-13	1.00E-13	1.00E-13	1.00E-13	1.00E-13	1.00E-13	1.00E-13	1.00E-13	1.00E-13
ABOVE RANGE	17.	7.	1.	0.	0.	0.	0.	0.	0.	0.
IN RANGE	1107.	1238.	1465.	2078.	2777.	4910.	13375.	19024.	26861.	33049.
BELOW RANGE	30.	285.	733.	1364.	1898.	3091.	6319.	7331.	6700.	4556.
ZERO	42240.	41800.	41007.	39521.	38320.	34779.	22626.	16216.	9309.	4862.
TOTAL X/Qs	43394.	43330.	43206.	42963.	42995.	42780.	42320.	42571.	42870.	42467.
% NON ZERO	2.66	3.53	5.09	8.01	10.87	18.70	46.54	61.91	78.29	88.55

95th PERCENTILE X/Q VALUES

	1.00E-13	1.00E-13	1.00E-13	1.00E-13	3.86E-11	4.31E-11	2.35E-11	1.85E-11	1.58E-11	1.31E-11

95% X/Q for standard averaging intervals

0 to 2 hours	1.00E-13
2 to 8 hours	1.00E-13
8 to 24 hours	6.46E-11
1 to 4 days	1.70E-11
4 to 30 days	1.15E-11

HOURLY VALUE RANGE

	MAX X/Q	MIN X/Q
CENTERLINE	1.33E-09	6.44E-23
SECTOR-AVERAGE	7.77E-10	3.75E-23

NORMAL PROGRAM COMPLETION

Station Chimney to Control Room Intake (Including Stack Downwash)

```
5
C:\TRACI\DRESDE~1\QDC95R1B.MET
C:\TRACI\DRESDE~1\QDC96R1B.MET
C:\TRACI\DRESDE~1\QDC97R1B.MET
C:\TRACI\DRESDE~1\QDC98R1B.MET
C:\TRACI\DRESDE~1\QDC99R1B.MET
   10.06
   90.22
  2
  3
   94.60
 3000.40
    0.21
    1.89
    1.86
 344  90
  127.10
    8.80
    0.00
5QDCT1.log
5QDCT1.cfd
 .2
    0.50
    4.30
  1  2  4  8  12  24  96 168 360 720
  1  2  4  8  11  22  87 152 324 648
    0.00    0.00
n
```

X/Q CUMULATIVE FREQUENCY DISTRIBUTIONS

XOQ	1	2	4	8	XOQ	12	24	96	168	360	720
Abv. Lim.	0.	0.	0.	0.	Abv. Lim.	0.	0.	0.	0.	0.	0.
9.120E-08	0.	0.	0.	0.	9.120E-08	0.	0.	0.	0.	0.	0.
8.318E-08	0.	0.	0.	0.	8.318E-08	0.	0.	0.	0.	0.	0.
7.586E-08	0.	0.	0.	0.	7.586E-08	0.	0.	0.	0.	0.	0.
6.918E-08	0.	0.	0.	0.	6.918E-08	0.	0.	0.	0.	0.	0.
6.310E-08	0.	0.	0.	0.	6.310E-08	0.	0.	0.	0.	0.	0.
5.754E-08	0.	0.	0.	0.	5.754E-08	0.	0.	0.	0.	0.	0.
5.248E-08	0.	0.	0.	0.	5.248E-08	0.	0.	0.	0.	0.	0.
4.786E-08	0.	0.	0.	0.	4.786E-08	0.	0.	0.	0.	0.	0.
4.365E-08	0.	0.	0.	0.	4.365E-08	0.	0.	0.	0.	0.	0.
3.981E-08	0.	0.	0.	0.	3.981E-08	0.	0.	0.	0.	0.	0.
3.631E-08	0.	0.	0.	0.	3.631E-08	0.	0.	0.	0.	0.	0.
3.311E-08	0.	0.	0.	0.	3.311E-08	0.	0.	0.	0.	0.	0.
3.020E-08	0.	0.	0.	0.	3.020E-08	0.	0.	0.	0.	0.	0.
2.754E-08	0.	0.	0.	0.	2.754E-08	0.	0.	0.	0.	0.	0.
2.512E-08	0.	0.	0.	0.	2.512E-08	0.	0.	0.	0.	0.	0.
2.291E-08	0.	0.	0.	0.	2.291E-08	0.	0.	0.	0.	0.	0.
2.089E-08	4.	1.	0.	0.	2.089E-08	0.	0.	0.	0.	0.	0.
1.905E-08	5.	3.	0.	0.	1.905E-08	0.	0.	0.	0.	0.	0.
1.738E-08	17.	7.	1.	0.	1.738E-08	0.	0.	0.	0.	0.	0.
1.585E-08	39.	14.	3.	0.	1.585E-08	0.	0.	0.	0.	0.	0.
1.445E-08	59.	23.	7.	0.	1.445E-08	0.	0.	0.	0.	0.	0.
1.318E-08	81.	39.	15.	2.	1.318E-08	0.	0.	0.	0.	0.	0.
1.202E-08	115.	57.	23.	3.	1.202E-08	0.	0.	0.	0.	0.	0.
1.096E-08	158.	86.	42.	4.	1.096E-08	0.	0.	0.	0.	0.	0.
1.000E-08	227.	139.	68.	5.	1.000E-08	0.	0.	0.	0.	0.	0.
9.120E-09	308.	188.	108.	12.	9.120E-09	2.	0.	0.	0.	0.	0.
8.318E-09	360.	251.	137.	35.	8.318E-09	4.	0.	0.	0.	0.	0.
7.586E-09	430.	320.	204.	54.	7.586E-09	6.	0.	0.	0.	0.	0.
6.918E-09	485.	375.	257.	87.	6.918E-09	7.	0.	0.	0.	0.	0.
6.310E-09	532.	418.	302.	126.	6.310E-09	10.	0.	0.	0.	0.	0.
5.754E-09	557.	478.	354.	166.	5.754E-09	29.	0.	0.	0.	0.	0.
5.248E-09	574.	520.	420.	252.	5.248E-09	55.	0.	0.	0.	0.	0.
4.786E-09	584.	586.	489.	307.	4.786E-09	88.	0.	0.	0.	0.	0.
4.365E-09	588.	635.	541.	398.	4.365E-09	138.	3.	0.	0.	0.	0.
3.981E-09	588.	676.	613.	490.	3.981E-09	194.	5.	0.	0.	0.	0.
3.631E-09	588.	725.	681.	600.	3.631E-09	278.	7.	0.	0.	0.	0.
3.311E-09	588.	759.	732.	671.	3.311E-09	361.	8.	0.	0.	0.	0.
3.020E-09	588.	783.	786.	742.	3.020E-09	488.	19.	0.	0.	0.	0.
2.754E-09	588.	795.	833.	828.	2.754E-09	548.	51.	0.	0.	0.	0.
2.512E-09	588.	810.	912.	944.	2.512E-09	682.	81.	0.	0.	0.	0.
2.291E-09	588.	815.	980.	1025.	2.291E-09	791.	128.	0.	0.	0.	0.
2.089E-09	588.	817.	1020.	1111.	2.089E-09	888.	177.	0.	0.	0.	0.
1.905E-09	588.	817.	1086.	1207.	1.905E-09	991.	253.	0.	0.	0.	0.
1.738E-09	588.	817.	1123.	1297.	1.738E-09	1135.	408.	0.	0.	0.	0.
1.585E-09	588.	817.	1163.	1360.	1.585E-09	1247.	588.	0.	0.	0.	0.
1.445E-09	588.	817.	1181.	1440.	1.445E-09	1371.	707.	0.	0.	0.	0.
1.318E-09	588.	817.	1200.	1511.	1.318E-09	1481.	925.	8.	0.	0.	0.
1.202E-09	588.	817.	1207.	1595.	1.202E-09	1589.	1139.	14.	0.	0.	0.
1.096E-09	588.	817.	1214.	1692.	1.096E-09	1692.	1306.	60.	2.	0.	0.
1.000E-09	588.	817.	1214.	1769.	1.000E-09	1791.	1588.	83.	5.	0.	0.
9.120E-10	588.	817.	1214.	1839.	9.120E-10	1875.	1774.	185.	15.	0.	0.

8.318E-10	588.	817.	1214.	1889.	8.318E-10	1986.	2040.	263.	30.	0.	0.
7.586E-10	588.	817.	1214.	1914.	7.586E-10	2102.	2319.	341.	54.	0.	0.
6.918E-10	588.	817.	1214.	1945.	6.918E-10	2178.	2566.	481.	74.	0.	0.
6.310E-10	588.	817.	1214.	1969.	6.310E-10	2295.	2737.	635.	328.	0.	0.
5.754E-10	588.	817.	1214.	1975.	5.754E-10	2367.	2916.	948.	409.	7.	0.
5.248E-10	588.	817.	1214.	1983.	5.248E-10	2446.	3115.	1385.	663.	22.	0.
4.786E-10	588.	817.	1214.	1983.	4.786E-10	2515.	3336.	1642.	844.	89.	0.
4.365E-10	588.	817.	1214.	1983.	4.365E-10	2595.	3480.	1966.	1120.	278.	7.
3.981E-10	588.	817.	1214.	1983.	3.981E-10	2620.	3642.	2484.	1412.	399.	44.
3.631E-10	588.	817.	1214.	1983.	3.631E-10	2674.	3809.	2958.	1744.	669.	160.
3.311E-10	588.	817.	1214.	1983.	3.311E-10	2695.	3962.	3491.	2325.	1094.	360.
3.020E-10	588.	817.	1214.	1983.	3.020E-10	2709.	4090.	4192.	3114.	1525.	629.
2.754E-10	588.	817.	1214.	1983.	2.754E-10	2719.	4228.	4758.	3727.	2614.	975.
2.512E-10	588.	817.	1214.	1983.	2.512E-10	2737.	4298.	5435.	4242.	3624.	1748.
2.291E-10	588.	817.	1214.	1983.	2.291E-10	2743.	4468.	5910.	5055.	4558.	2523.
2.089E-10	588.	817.	1214.	1983.	2.089E-10	2747.	4568.	6893.	5861.	5344.	3751.
1.905E-10	588.	817.	1214.	1983.	1.905E-10	2747.	4675.	7511.	6772.	6228.	5644.
1.738E-10	588.	817.	1214.	1983.	1.738E-10	2747.	4741.	7951.	7790.	7499.	6757.
1.585E-10	588.	817.	1214.	1983.	1.585E-10	2747.	4799.	8323.	8627.	8881.	8748.
1.445E-10	588.	817.	1214.	1983.	1.445E-10	2747.	4835.	8687.	9270.	9645.	9748.
1.318E-10	588.	817.	1214.	1983.	1.318E-10	2747.	4872.	9116.	9870.	10210.	11322.
1.202E-10	588.	817.	1214.	1983.	1.202E-10	2747.	4891.	9760.	11291.	11086.	12402.
1.096E-10	588.	817.	1214.	1983.	1.096E-10	2747.	4894.	10091.	11898.	12083.	13713.
1.000E-10	588.	817.	1214.	1983.	1.000E-10	2747.	4910.	10311.	12378.	13239.	14542.
9.120E-11	588.	817.	1214.	1983.	9.120E-11	2747.	4910.	10606.	12790.	13904.	15886.
8.318E-11	588.	817.	1214.	1983.	8.318E-11	2747.	4910.	11005.	13262.	15119.	16943.
7.586E-11	588.	817.	1214.	1983.	7.586E-11	2747.	4910.	11196.	13712.	15890.	17916.
6.918E-11	590.	817.	1214.	1983.	6.918E-11	2747.	4910.	11239.	14612.	16848.	18371.
6.310E-11	593.	818.	1214.	1983.	6.310E-11	2747.	4910.	11464.	15016.	17143.	18778.
5.754E-11	599.	819.	1214.	1983.	5.754E-11	2747.	4910.	12000.	15069.	18076.	19699.
5.248E-11	610.	823.	1214.	1983.	5.248E-11	2747.	4910.	12303.	15420.	18357.	20199.
4.786E-11	628.	828.	1215.	1983.	4.786E-11	2747.	4910.	12724.	15896.	19171.	20548.
4.365E-11	659.	841.	1217.	1983.	4.365E-11	2747.	4910.	12982.	16075.	20148.	21464.
3.981E-11	688.	848.	1220.	1983.	3.981E-11	2747.	4910.	13148.	16112.	20317.	22236.
3.631E-11	719.	863.	1222.	1983.	3.631E-11	2747.	4910.	13221.	16437.	20837.	22808.
3.311E-11	766.	876.	1229.	1983.	3.311E-11	2747.	4910.	13329.	17143.	21877.	23214.
3.020E-11	814.	898.	1236.	1983.	3.020E-11	2747.	4910.	13352.	17533.	22235.	23524.
2.754E-11	866.	923.	1244.	1987.	2.754E-11	2747.	4910.	13354.	18154.	22283.	24554.
2.512E-11	930.	958.	1257.	1987.	2.512E-11	2747.	4910.	13375.	18554.	22794.	25181.
2.291E-11	990.	1010.	1269.	1994.	2.291E-11	2747.	4910.	13375.	18769.	23180.	26047.
2.089E-11	1040.	1041.	1302.	1995.	2.089E-11	2747.	4910.	13375.	18856.	23616.	26901.
1.905E-11	1065.	1094.	1319.	2002.	1.905E-11	2751.	4910.	13375.	19001.	23634.	27391.
1.738E-11	1096.	1125.	1355.	2012.	1.738E-11	2752.	4910.	13375.	19003.	23636.	27719.
1.585E-11	1117.	1181.	1387.	2029.	1.585E-11	2753.	4910.	13375.	19003.	25033.	28366.
1.445E-11	1132.	1232.	1414.	2046.	1.445E-11	2760.	4910.	13375.	19024.	25115.	28557.
1.318E-11	1146.	1287.	1456.	2080.	1.318E-11	2768.	4910.	13375.	19024.	25568.	29094.
1.202E-11	1150.	1345.	1510.	2104.	1.202E-11	2770.	4910.	13375.	19024.	26555.	29098.
1.096E-11	1154.	1399.	1558.	2160.	1.096E-11	2789.	4910.	13375.	19024.	26612.	30154.
1.000E-11	1154.	1437.	1616.	2191.	1.000E-11	2810.	4910.	13375.	19024.	26677.	30163.
Belw. Lim.	0.	93.	583.	1251.	Belw. Lim.	1867.	3118.	6507.	7705.	7471.	8581.

Program Title: ARCON96.

Developed For: U.S. Nuclear Regulatory Commission
Office of Nuclear Reactor Regulation
Division of Reactor Program Management

Date: June 25, 1997 11:00 a.m.

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Code Documentation: NUREG/CR-6331 Rev. 1

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Program Run 8/ 1/2005 at 13:49:40

******* ARCON INPUT **********

Number of Meteorological Data Files = 5
Meteorological Data File Names
C:\TRACI\DRESDE~1\QDC95R1B.MET
C:\TRACI\DRESDE~1\QDC96R1B.MET
C:\TRACI\DRESDE~1\QDC97R1B.MET
C:\TRACI\DRESDE~1\QDC98R1B.MET
C:\TRACI\DRESDE~1\QDC99R1B.MET

Height of lower wind instrument (m) = 10.1
Height of upper wind instrument (m) = 90.2
Wind speeds entered as miles per hour

Elevated release
Release height (m) = 94.6
Building Area (m^2) = 3000.4
Effluent vertical velocity (m/s) = .21
Vent or stack flow (m^3/s) = 1.89
Vent or stack radius (m) = 1.86

Direction .. intake to source (deg) = 344
Wind direction sector width (deg) = 90
Wind direction window (deg) = 299 - 029
Distance to intake (m) = 127.1

Intake height (m) = 8.8
Terrain elevation difference (m) = .0

Output file names
5QDCT1.log
5QDCT1.cfd

Minimum Wind Speed (m/s) = .5
Surface roughness length (m) = .20
Sector averaging constant = 4.3

Initial value of sigma y = .00
Initial value of sigma z = .00

Expanded output for code testing not selected

Total number of hours of data processed = 43824
Hours of missing data = 430
Hours direction in window = 10373
Hours elevated plume w/ dir. in window = 5861
Hours of calm winds = 8
Hours direction not in window or calm = 33013

DISTRIBUTION SUMMARY DATA BY AVERAGING INTERVAL

AVER. PER.	1	2	4	8	12	24	96	168	360	720
UPPER LIM.	1.00E-07	1.00E-07	1.00E-07	1.00E-07	1.00E-07	1.00E-07	1.00E-07	1.00E-07	1.00E-07	1.00E-07
LOW LIM.	1.00E-11	1.00E-11	1.00E-11	1.00E-11	1.00E-11	1.00E-11	1.00E-11	1.00E-11	1.00E-11	1.00E-11
ABOVE RANGE	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
IN RANGE	1154.	1437.	1616.	2191.	2810.	4910.	13375.	19024.	26677.	30163.
BELOW RANGE	0.	93.	583.	1251.	1867.	3118.	6507.	7705.	7471.	8581.
ZERO	42240.	41800.	41007.	39521.	38318.	34752.	22438.	15842.	8722.	3723.
TOTAL X/Qs	43394.	43330.	43206.	42963.	42995.	42780.	42320.	42571.	42870.	42467.
% NON ZERO	2.66	3.53	5.09	8.01	10.88	18.77	46.98	62.79	79.65	91.23

95th PERCENTILE X/Q VALUES
1.00E-11 1.00E-11 1.00E-11 1.12E-11 7.17E-10 8.06E-10 4.25E-10 3.42E-10 2.87E-10 2.40E-10

95% X/Q for standard averaging intervals

0 to 2 hours 1.00E-11
2 to 8 hours 1.16E-11
8 to 24 hours 1.20E-09
1 to 4 days 2.99E-10
4 to 30 days 2.12E-10

HOURLY VALUE RANGE

	MAX X/Q	MIN X/Q
CENTERLINE	2.22E-08	2.48E-42
SECTOR-AVERAGE	1.29E-08	1.44E-42

NORMAL PROGRAM COMPLETION

Reactor Building Vent Exhaust Stack to Control Room Intake (Turbine Building Area)

```
5
C:\TRACI'~1\PEACHB~1\BYRON\QDC95R1A.MET
C:\TRACI'~1\PEACHB~1\BYRON\QDC96R1A.MET
C:\TRACI'~1\PEACHB~1\BYRON\QDC97R1A.MET
C:\TRACI'~1\PEACHB~1\BYRON\QDC98R1A.MET
C:\TRACI'~1\PEACHB~1\BYRON\QDC99R1A.MET
   10.06
   59.74
  2
  1
   48.60
  3152.90
    0.00
    0.00
    0.00
  18  90
   94.50
    8.80
    0.00
6QDC.log
6QDC.cfd
 .2
    0.50
    4.30
  1  2  4  8  12  24  96 168 360 720
  1  2  4  8  11  22  87 152 324 648
    0.00    0.00
n
```

X/Q CUMULATIVE FREQUENCY DISTRIBUTIONS

XOQ	1	2	4	8	XOQ	12	24	96	168	360	720
Abv. Lim.	0.	0.	0.	0.	Abv. Lim.	0.	0.	0.	0.	0.	0.
9.120E-04	0.	0.	0.	0.	9.120E-04	0.	0.	0.	0.	0.	0.
8.318E-04	0.	0.	0.	0.	8.318E-04	0.	0.	0.	0.	0.	0.
7.586E-04	93.	53.	21.	0.	7.586E-04	0.	0.	0.	0.	0.	0.
6.918E-04	551.	372.	222.	48.	6.918E-04	0.	0.	0.	0.	0.	0.
6.310E-04	1440.	1049.	613.	240.	6.310E-04	0.	0.	0.	0.	0.	0.
5.754E-04	2247.	1900.	1325.	750.	5.754E-04	19.	0.	0.	0.	0.	0.
5.248E-04	3718.	2964.	2211.	1377.	5.248E-04	186.	0.	0.	0.	0.	0.
4.786E-04	4589.	3738.	2999.	2130.	4.786E-04	614.	0.	0.	0.	0.	0.
4.365E-04	5145.	4330.	3706.	2912.	4.365E-04	1200.	7.	0.	0.	0.	0.
3.981E-04	5630.	4759.	4385.	3664.	3.981E-04	1967.	68.	0.	0.	0.	0.
3.631E-04	6023.	5202.	4962.	4300.	3.631E-04	2741.	388.	0.	0.	0.	0.
3.311E-04	6327.	5575.	5447.	4965.	3.311E-04	3485.	1006.	0.	0.	0.	0.
3.020E-04	6547.	6224.	6061.	5642.	3.020E-04	4253.	1674.	12.	0.	0.	0.
2.754E-04	6779.	6774.	6562.	6269.	2.754E-04	4971.	2360.	38.	0.	0.	0.
2.512E-04	6932.	7315.	7068.	6934.	2.512E-04	5717.	3080.	77.	0.	0.	0.
2.291E-04	7709.	7908.	7536.	7515.	2.291E-04	6386.	3882.	185.	13.	0.	0.
2.089E-04	7833.	8171.	7819.	8072.	2.089E-04	7075.	4701.	382.	36.	0.	0.
1.905E-04	7969.	8445.	8108.	8594.	1.905E-04	7662.	5544.	681.	90.	0.	0.
1.738E-04	8092.	8658.	8559.	9075.	1.738E-04	8268.	6423.	1264.	323.	0.	0.
1.585E-04	8233.	8874.	8961.	9541.	1.585E-04	8812.	7225.	1841.	562.	0.	0.
1.445E-04	8352.	9074.	9404.	10060.	1.445E-04	9358.	8024.	2654.	963.	16.	0.
1.318E-04	8445.	9197.	9966.	10466.	1.318E-04	9849.	8789.	3839.	1483.	141.	0.
1.202E-04	8525.	9778.	10529.	10885.	1.202E-04	10293.	9508.	5170.	2571.	466.	0.
1.096E-04	8587.	9947.	10803.	11163.	1.096E-04	10731.	10266.	6434.	3993.	1151.	0.
1.000E-04	8611.	10018.	11018.	11384.	1.000E-04	11265.	10951.	7953.	5459.	2331.	313.
9.120E-05	8637.	10070.	11204.	11686.	9.120E-05	11694.	11677.	9499.	6926.	3869.	1032.
8.318E-05	8649.	10110.	11330.	11949.	8.318E-05	12115.	12387.	11045.	9101.	6227.	3261.
7.586E-05	8659.	10138.	11439.	12400.	7.586E-05	12561.	13087.	12506.	11583.	8554.	5531.
6.918E-05	8668.	10172.	11557.	12846.	6.918E-05	12868.	13771.	14035.	13990.	11462.	8988.
6.310E-05	8676.	10195.	11591.	13303.	6.310E-05	13177.	14410.	15819.	15905.	14765.	13427.
5.754E-05	8676.	10212.	12320.	13887.	5.754E-05	13631.	14966.	17489.	18160.	18346.	16752.
5.248E-05	8677.	10222.	12362.	14062.	5.248E-05	14022.	15571.	18951.	19957.	21805.	21173.
4.786E-05	8677.	10228.	12381.	14248.	4.786E-05	14428.	16173.	20579.	21821.	24885.	24632.
4.365E-05	8678.	10233.	12415.	14395.	4.365E-05	14878.	16660.	22014.	23323.	26840.	28329.
3.981E-05	8678.	10233.	12434.	14561.	3.981E-05	15336.	17177.	23491.	25080.	28732.	31380.
3.631E-05	8678.	10234.	12451.	14696.	3.631E-05	15537.	17679.	24680.	26818.	30639.	33814.
3.311E-05	8678.	10234.	12478.	14760.	3.311E-05	15796.	18068.	25720.	28554.	32478.	36360.
3.020E-05	8678.	10235.	12490.	15501.	3.020E-05	16120.	18604.	26738.	30128.	33970.	38306.
2.754E-05	8678.	10236.	12505.	15674.	2.754E-05	16341.	19025.	27745.	31418.	35233.	39526.
2.512E-05	8678.	10236.	12512.	15709.	2.512E-05	16670.	19527.	28570.	32710.	37026.	40346.
2.291E-05	8678.	10237.	12526.	15744.	2.291E-05	16979.	20001.	29272.	33747.	38185.	41077.
2.089E-05	8678.	10237.	12527.	15755.	2.089E-05	17076.	20290.	30195.	34663.	39061.	41250.
1.905E-05	8678.	10237.	12528.	15768.	1.905E-05	17833.	20659.	30829.	35528.	39722.	41454.
1.738E-05	8678.	10237.	12528.	15795.	1.738E-05	17908.	20969.	31522.	36097.	40181.	41747.
1.585E-05	8678.	10237.	12529.	15806.	1.585E-05	17974.	21232.	32130.	36598.	40562.	41948.
1.445E-05	8678.	10237.	12529.	15815.	1.445E-05	18047.	21644.	32591.	37107.	41005.	42058.
1.318E-05	8678.	10237.	12530.	15829.	1.318E-05	18073.	22037.	33078.	37472.	41212.	42118.
1.202E-05	8678.	10237.	12530.	15837.	1.202E-05	18100.	22364.	33698.	37926.	41448.	42185.
1.096E-05	8678.	10237.	12531.	15848.	1.096E-05	18467.	22738.	33977.	38202.	41693.	42280.
1.000E-05	8678.	10237.	12531.	15848.	1.000E-05	18481.	23316.	34259.	38568.	41727.	42471.
9.120E-06	8678.	10237.	12531.	15848.	9.120E-06	18500.	23484.	34792.	38806.	41823.	42473.

8.318E-06	8678.	10237.	12531.	15848.	8.318E-06	18512.	23606.	35068.	39019.	41898.	42476.
7.586E-06	8678.	10237.	12531.	15849.	7.586E-06	18539.	23755.	35482.	39455.	41977.	42478.
6.918E-06	8678.	10237.	12531.	15850.	6.918E-06	18545.	23815.	35708.	39795.	42039.	42478.
6.310E-06	8678.	10237.	12531.	15850.	6.310E-06	18547.	23860.	35835.	39887.	42114.	42478.
5.754E-06	8678.	10237.	12531.	15851.	5.754E-06	18555.	24631.	36127.	40057.	42199.	42478.
5.248E-06	8678.	10237.	12531.	15851.	5.248E-06	18559.	24642.	36310.	40284.	42226.	42478.
4.786E-06	8678.	10237.	12531.	15851.	4.786E-06	18565.	24652.	36476.	40343.	42382.	42478.
4.365E-06	8678.	10237.	12531.	15851.	4.365E-06	18567.	24692.	36639.	40459.	42399.	42478.
3.981E-06	8678.	10237.	12531.	15851.	3.981E-06	18567.	24698.	36860.	40669.	42403.	42478.
3.631E-06	8678.	10237.	12531.	15851.	3.631E-06	18567.	24701.	36997.	40705.	42427.	42478.
3.311E-06	8678.	10237.	12531.	15851.	3.311E-06	18567.	24720.	37231.	40837.	42475.	42478.
3.020E-06	8678.	10237.	12531.	15851.	3.020E-06	18567.	24724.	37360.	40869.	42572.	42478.
2.754E-06	8678.	10237.	12531.	15851.	2.754E-06	18567.	24741.	37690.	40902.	42581.	42478.
2.512E-06	8678.	10237.	12531.	15851.	2.512E-06	18567.	24749.	37917.	41017.	42678.	42478.
2.291E-06	8678.	10237.	12531.	15851.	2.291E-06	18567.	24751.	38111.	41087.	42704.	42478.
2.089E-06	8678.	10237.	12531.	15851.	2.089E-06	18567.	24751.	38173.	41124.	42704.	42478.
1.905E-06	8678.	10237.	12531.	15851.	1.905E-06	18567.	24751.	38240.	41219.	42736.	42478.
1.738E-06	8678.	10237.	12531.	15851.	1.738E-06	18567.	24751.	38330.	41267.	42736.	42478.
1.585E-06	8678.	10237.	12531.	15851.	1.585E-06	18567.	24751.	38368.	41269.	42736.	42478.
1.445E-06	8678.	10237.	12531.	15851.	1.445E-06	18567.	24751.	38702.	41382.	42737.	42478.
1.318E-06	8678.	10237.	12531.	15851.	1.318E-06	18567.	24751.	38704.	41436.	42737.	42478.
1.202E-06	8678.	10237.	12531.	15851.	1.202E-06	18567.	24751.	38712.	41454.	42737.	42478.
1.096E-06	8678.	10237.	12531.	15851.	1.096E-06	18567.	24751.	38807.	41454.	42737.	42478.
1.000E-06	8678.	10237.	12531.	15851.	1.000E-06	18567.	24751.	38811.	41454.	42738.	42478.
9.120E-07	8678.	10237.	12531.	15851.	9.120E-07	18567.	24751.	38811.	41492.	42738.	42478.
8.318E-07	8678.	10237.	12531.	15851.	8.318E-07	18567.	24751.	38846.	41661.	42738.	42478.
7.586E-07	8678.	10237.	12531.	15851.	7.586E-07	18567.	24751.	38847.	41662.	42738.	42478.
6.918E-07	8678.	10237.	12531.	15851.	6.918E-07	18567.	24751.	38895.	41662.	42738.	42478.
6.310E-07	8678.	10237.	12531.	15851.	6.310E-07	18567.	24751.	38896.	41678.	42738.	42478.
5.754E-07	8678.	10237.	12531.	15851.	5.754E-07	18567.	24751.	38896.	41678.	42738.	42478.
5.248E-07	8678.	10237.	12531.	15851.	5.248E-07	18567.	24751.	38896.	41678.	42738.	42478.
4.786E-07	8678.	10237.	12531.	15851.	4.786E-07	18567.	24751.	38896.	41678.	42738.	42478.
4.365E-07	8678.	10237.	12531.	15851.	4.365E-07	18567.	24751.	38896.	41678.	42738.	42478.
3.981E-07	8678.	10237.	12531.	15851.	3.981E-07	18567.	24751.	38896.	41719.	42738.	42478.
3.631E-07	8678.	10237.	12531.	15851.	3.631E-07	18567.	24751.	38896.	41720.	42738.	42478.
3.311E-07	8678.	10237.	12531.	15851.	3.311E-07	18567.	24751.	38896.	41720.	42738.	42478.
3.020E-07	8678.	10237.	12531.	15851.	3.020E-07	18567.	24751.	38896.	41720.	42738.	42478.
2.754E-07	8678.	10237.	12531.	15851.	2.754E-07	18567.	24751.	38896.	41720.	42738.	42478.
2.512E-07	8678.	10237.	12531.	15851.	2.512E-07	18567.	24751.	38896.	41720.	42738.	42478.
2.291E-07	8678.	10237.	12531.	15851.	2.291E-07	18567.	24751.	38896.	41720.	42738.	42478.
2.089E-07	8678.	10237.	12531.	15851.	2.089E-07	18567.	24751.	38896.	41720.	42738.	42478.
1.905E-07	8678.	10237.	12531.	15851.	1.905E-07	18567.	24751.	38896.	41720.	42738.	42478.
1.738E-07	8678.	10237.	12531.	15851.	1.738E-07	18567.	24751.	38896.	41720.	42738.	42478.
1.585E-07	8678.	10237.	12531.	15851.	1.585E-07	18567.	24751.	38896.	41720.	42738.	42478.
1.445E-07	8678.	10237.	12531.	15851.	1.445E-07	18567.	24751.	38896.	41720.	42738.	42478.
1.318E-07	8678.	10237.	12531.	15851.	1.318E-07	18567.	24751.	38896.	41720.	42738.	42478.
1.202E-07	8678.	10237.	12531.	15851.	1.202E-07	18567.	24751.	38896.	41720.	42738.	42478.
1.096E-07	8678.	10237.	12531.	15851.	1.096E-07	18567.	24751.	38896.	41720.	42738.	42478.
1.000E-07	8678.	10237.	12531.	15851.	1.000E-07	18567.	24751.	38896.	41720.	42738.	42478.
Belw. Lim.	0.	0.	0.	0.	Belw. Lim.	0.	0.	0.	0.	0.	0.

Program Title: ARCON96.

Developed For: U.S. Nuclear Regulatory Commission
Office of Nuclear Reactor Regulation
Division of Reactor Program Management

Date: June 25, 1997 11:00 a.m.

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Code Documentation: NUREG/CR-6331 Rev. 1

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Program Run 9/ 9/2004 at 13:06:11

******* ARCON INPUT **********

Number of Meteorological Data Files = 5
Meteorological Data File Names
C:\TRACI'~1\PEACHB~1\BYRON\QDC95R1A.MET
C:\TRACI'~1\PEACHB~1\BYRON\QDC96R1A.MET
C:\TRACI'~1\PEACHB~1\BYRON\QDC97R1A.MET
C:\TRACI'~1\PEACHB~1\BYRON\QDC98R1A.MET
C:\TRACI'~1\PEACHB~1\BYRON\QDC99R1A.MET

Height of lower wind instrument (m) = 10.1
Height of upper wind instrument (m) = 59.7
Wind speeds entered as miles per hour

Ground-level release
Release height (m) = 48.6
Building Area (m^2) = 3152.9
Effluent vertical velocity (m/s) = .00
Vent or stack flow (m^3/s) = .00
Vent or stack radius (m) = .00

Direction .. intake to source (deg) = 018
Wind direction sector width (deg) = 90
Wind direction window (deg) = 333 - 063
Distance to intake (m) = 94.5

Intake height (m) = 8.8
Terrain elevation difference (m) = .0

Output file names
6QDC.log
6QDC.cfd

Minimum Wind Speed (m/s) = .5
Surface roughness length (m) = .20
Sector averaging constant = 4.3

Initial value of sigma y = .00
Initial value of sigma z = .00

Expanded output for code testing not selected

Total number of hours of data processed = 43824
Hours of missing data = 341
Hours direction in window = 8014
Hours elevated plume w/ dir. in window = 0
Hours of calm winds = 664
Hours direction not in window or calm = 34805

DISTRIBUTION SUMMARY DATA BY AVERAGING INTERVAL

AVER. PER.	1	2	4	8	12	24	96	168	360	720
UPPER LIM.	1.00E-03	1.00E-03	1.00E-03	1.00E-03	1.00E-03	1.00E-03	1.00E-03	1.00E-03	1.00E-03	1.00E-03
LOW LIM.	1.00E-07	1.00E-07	1.00E-07	1.00E-07	1.00E-07	1.00E-07	1.00E-07	1.00E-07	1.00E-07	1.00E-07
ABOVE RANGE	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
IN RANGE	8678.	10237.	12531.	15851.	18567.	24751.	38896.	41720.	42738.	42478.
BELOW RANGE	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
ZERO	34805.	33209.	30841.	27373.	24682.	18374.	3801.	893.	134.	0.
TOTAL X/Qs	43483.	43446.	43372.	43224.	43249.	43125.	42697.	42613.	42872.	42478.
% NON ZERO	19.96	23.56	28.89	36.67	42.93	57.39	91.10	97.90	99.69	100.00

95th PERCENTILE X/Q VALUES

5.80E-04	5.62E-04	5.27E-04	4.77E-04	3.89E-04	2.83E-04	1.53E-04	1.25E-04	1.02E-04	8.73E-05

95% X/Q for standard averaging intervals

0 to 2 hours	5.80E-04
2 to 8 hours	4.42E-04
8 to 24 hours	1.86E-04
1 to 4 days	1.10E-04
4 to 30 days	7.71E-05

HOURLY VALUE RANGE

	MAX X/Q	MIN X/Q
CENTERLINE	7.95E-04	4.64E-05
SECTOR-AVERAGE	4.63E-04	2.70E-05

NORMAL PROGRAM COMPLETION

Reactor Building Vent Exhaust Stack to Control Room Intake (Reactor Building Area)

```
5
C:\TRACI'~1\PEACHB~1\BYRON\QDC95R1A.MET
C:\TRACI'~1\PEACHB~1\BYRON\QDC96R1A.MET
C:\TRACI'~1\PEACHB~1\BYRON\QDC97R1A.MET
C:\TRACI'~1\PEACHB~1\BYRON\QDC98R1A.MET
C:\TRACI'~1\PEACHB~1\BYRON\QDC99R1A.MET
   10.06
   59.74
  2
  1
   48.60
  2696.30
    0.00
    0.00
    0.00
  18  90
   94.50
    8.80
    0.00
7QDC.log
7QDC.cfd
 .2
    0.50
    4.30
  1  2  4  8  12  24  96 168 360 720
  1  2  4  8  11  22  87 152 324 648
    0.00    0.00
n
```

X/Q CUMULATIVE FREQUENCY DISTRIBUTIONS

XOQ	1	2	4	8	XOQ	12	24	96	168	360	720
Abv. Lim.	0.	0.	0.	0.	Abv. Lim.	0.	0.	0.	0.	0.	0.
9.120E-04	0.	0.	0.	0.	9.120E-04	0.	0.	0.	0.	0.	0.
8.318E-04	0.	0.	0.	0.	8.318E-04	0.	0.	0.	0.	0.	0.
7.586E-04	96.	60.	24.	0.	7.586E-04	0.	0.	0.	0.	0.	0.
6.918E-04	554.	378.	228.	49.	6.918E-04	0.	0.	0.	0.	0.	0.
6.310E-04	1465.	1057.	624.	244.	6.310E-04	0.	0.	0.	0.	0.	0.
5.754E-04	2265.	1914.	1334.	762.	5.754E-04	19.	0.	0.	0.	0.	0.
5.248E-04	3746.	2975.	2221.	1389.	5.248E-04	198.	0.	0.	0.	0.	0.
4.786E-04	4589.	3759.	3017.	2145.	4.786E-04	622.	0.	0.	0.	0.	0.
4.365E-04	5145.	4342.	3726.	2928.	4.365E-04	1207.	7.	0.	0.	0.	0.
3.981E-04	5630.	4774.	4399.	3676.	3.981E-04	1978.	71.	0.	0.	0.	0.
3.631E-04	6039.	5210.	4972.	4313.	3.631E-04	2758.	397.	0.	0.	0.	0.
3.311E-04	6328.	5583.	5455.	4976.	3.311E-04	3501.	1025.	0.	0.	0.	0.
3.020E-04	6555.	6236.	6067.	5652.	3.020E-04	4264.	1683.	12.	0.	0.	0.
2.754E-04	6779.	6789.	6570.	6280.	2.754E-04	4985.	2370.	39.	0.	0.	0.
2.512E-04	6939.	7322.	7076.	6944.	2.512E-04	5730.	3092.	77.	0.	0.	0.
2.291E-04	7715.	7918.	7541.	7527.	2.291E-04	6394.	3900.	188.	13.	0.	0.
2.089E-04	7833.	8173.	7825.	8075.	2.089E-04	7088.	4711.	386.	37.	0.	0.
1.905E-04	7969.	8447.	8110.	8597.	1.905E-04	7671.	5565.	685.	91.	0.	0.
1.738E-04	8099.	8662.	8564.	9081.	1.738E-04	8293.	6428.	1272.	328.	0.	0.
1.585E-04	8235.	8875.	8965.	9555.	1.585E-04	8827.	7243.	1852.	565.	0.	0.
1.445E-04	8353.	9080.	9413.	10066.	1.445E-04	9364.	8038.	2680.	973.	18.	0.
1.318E-04	8446.	9199.	9984.	10467.	1.318E-04	9856.	8806.	3853.	1500.	145.	0.
1.202E-04	8528.	9781.	10541.	10890.	1.202E-04	10297.	9531.	5192.	2582.	472.	0.
1.096E-04	8587.	9948.	10807.	11164.	1.096E-04	10734.	10276.	6464.	4011.	1159.	0.
1.000E-04	8612.	10019.	11023.	11386.	1.000E-04	11273.	10973.	7976.	5471.	2343.	318.
9.120E-05	8638.	10071.	11205.	11691.	9.120E-05	11702.	11699.	9516.	6945.	3897.	1043.
8.318E-05	8649.	10110.	11331.	11958.	8.318E-05	12121.	12397.	11068.	9171.	6260.	3282.
7.586E-05	8659.	10142.	11445.	12414.	7.586E-05	12566.	13098.	12534.	11627.	8573.	5570.
6.918E-05	8668.	10173.	11558.	12848.	6.918E-05	12869.	13787.	14061.	14020.	11486.	9136.
6.310E-05	8676.	10195.	11591.	13317.	6.310E-05	13179.	14414.	15857.	16013.	14800.	13593.
5.754E-05	8676.	10212.	12320.	13887.	5.754E-05	13631.	14972.	17500.	18261.	18450.	16837.
5.248E-05	8677.	10222.	12362.	14062.	5.248E-05	14025.	15574.	18963.	20002.	21897.	21207.
4.786E-05	8677.	10228.	12383.	14250.	4.786E-05	14428.	16186.	20593.	21846.	24950.	24735.
4.365E-05	8678.	10233.	12415.	14395.	4.365E-05	14880.	16664.	22049.	23332.	26860.	28366.
3.981E-05	8678.	10233.	12434.	14561.	3.981E-05	15338.	17177.	23519.	25117.	28797.	31391.
3.631E-05	8678.	10234.	12451.	14697.	3.631E-05	15540.	17684.	24688.	26891.	30712.	33863.
3.311E-05	8678.	10234.	12478.	14762.	3.311E-05	15803.	18071.	25726.	28638.	32501.	36484.
3.020E-05	8678.	10235.	12490.	15502.	3.020E-05	16121.	18613.	26748.	30158.	33977.	38347.
2.754E-05	8678.	10236.	12505.	15677.	2.754E-05	16345.	19028.	27777.	31492.	35241.	39530.
2.512E-05	8678.	10236.	12512.	15709.	2.512E-05	16681.	19543.	28580.	32717.	37028.	40351.
2.291E-05	8678.	10237.	12526.	15744.	2.291E-05	16980.	20001.	29276.	33753.	38215.	41081.
2.089E-05	8678.	10237.	12527.	15755.	2.089E-05	17076.	20293.	30197.	34708.	39064.	41252.
1.905E-05	8678.	10237.	12528.	15768.	1.905E-05	17836.	20659.	30831.	35532.	39723.	41482.
1.738E-05	8678.	10237.	12528.	15795.	1.738E-05	17908.	20970.	31527.	36101.	40186.	41747.
1.585E-05	8678.	10237.	12529.	15806.	1.585E-05	17975.	21232.	32135.	36686.	40563.	41948.
1.445E-05	8678.	10237.	12529.	15815.	1.445E-05	18047.	21656.	32592.	37108.	41006.	42060.
1.318E-05	8678.	10237.	12530.	15829.	1.318E-05	18073.	22039.	33080.	37476.	41212.	42118.
1.202E-05	8678.	10237.	12530.	15837.	1.202E-05	18100.	22365.	33702.	37926.	41449.	42185.
1.096E-05	8678.	10237.	12531.	15848.	1.096E-05	18467.	22738.	33977.	38202.	41694.	42281.
1.000E-05	8678.	10237.	12531.	15848.	1.000E-05	18481.	23316.	34260.	38568.	41729.	42471.
9.120E-06	8678.	10237.	12531.	15848.	9.120E-06	18500.	23505.	34792.	38806.	41844.	42473.

8.318E-06	8678.	10237.	12531.	15848.	8.318E-06	18513.	23606.	35069.	39019.	41899.	42476.
7.586E-06	8678.	10237.	12531.	15849.	7.586E-06	18539.	23755.	35483.	39462.	41977.	42478.
6.918E-06	8678.	10237.	12531.	15850.	6.918E-06	18545.	23816.	35709.	39796.	42039.	42478.
6.310E-06	8678.	10237.	12531.	15850.	6.310E-06	18547.	23860.	35835.	39887.	42114.	42478.
5.754E-06	8678.	10237.	12531.	15851.	5.754E-06	18555.	24631.	36127.	40058.	42199.	42478.
5.248E-06	8678.	10237.	12531.	15851.	5.248E-06	18559.	24642.	36310.	40285.	42227.	42478.
4.786E-06	8678.	10237.	12531.	15851.	4.786E-06	18565.	24653.	36476.	40343.	42382.	42478.
4.365E-06	8678.	10237.	12531.	15851.	4.365E-06	18567.	24692.	36639.	40459.	42399.	42478.
3.981E-06	8678.	10237.	12531.	15851.	3.981E-06	18567.	24699.	36860.	40669.	42403.	42478.
3.631E-06	8678.	10237.	12531.	15851.	3.631E-06	18567.	24701.	36998.	40705.	42427.	42478.
3.311E-06	8678.	10237.	12531.	15851.	3.311E-06	18567.	24720.	37233.	40837.	42475.	42478.
3.020E-06	8678.	10237.	12531.	15851.	3.020E-06	18567.	24724.	37360.	40869.	42572.	42478.
2.754E-06	8678.	10237.	12531.	15851.	2.754E-06	18567.	24741.	37690.	40902.	42581.	42478.
2.512E-06	8678.	10237.	12531.	15851.	2.512E-06	18567.	24749.	37917.	41017.	42678.	42478.
2.291E-06	8678.	10237.	12531.	15851.	2.291E-06	18567.	24751.	38111.	41087.	42704.	42478.
2.089E-06	8678.	10237.	12531.	15851.	2.089E-06	18567.	24751.	38173.	41124.	42704.	42478.
1.905E-06	8678.	10237.	12531.	15851.	1.905E-06	18567.	24751.	38240.	41219.	42736.	42478.
1.738E-06	8678.	10237.	12531.	15851.	1.738E-06	18567.	24751.	38330.	41267.	42736.	42478.
1.585E-06	8678.	10237.	12531.	15851.	1.585E-06	18567.	24751.	38368.	41269.	42736.	42478.
1.445E-06	8678.	10237.	12531.	15851.	1.445E-06	18567.	24751.	38702.	41382.	42737.	42478.
1.318E-06	8678.	10237.	12531.	15851.	1.318E-06	18567.	24751.	38704.	41436.	42737.	42478.
1.202E-06	8678.	10237.	12531.	15851.	1.202E-06	18567.	24751.	38712.	41454.	42737.	42478.
1.096E-06	8678.	10237.	12531.	15851.	1.096E-06	18567.	24751.	38807.	41454.	42737.	42478.
1.000E-06	8678.	10237.	12531.	15851.	1.000E-06	18567.	24751.	38811.	41454.	42738.	42478.
9.120E-07	8678.	10237.	12531.	15851.	9.120E-07	18567.	24751.	38811.	41492.	42738.	42478.
8.318E-07	8678.	10237.	12531.	15851.	8.318E-07	18567.	24751.	38846.	41661.	42738.	42478.
7.586E-07	8678.	10237.	12531.	15851.	7.586E-07	18567.	24751.	38847.	41662.	42738.	42478.
6.918E-07	8678.	10237.	12531.	15851.	6.918E-07	18567.	24751.	38895.	41662.	42738.	42478.
6.310E-07	8678.	10237.	12531.	15851.	6.310E-07	18567.	24751.	38896.	41678.	42738.	42478.
5.754E-07	8678.	10237.	12531.	15851.	5.754E-07	18567.	24751.	38896.	41678.	42738.	42478.
5.248E-07	8678.	10237.	12531.	15851.	5.248E-07	18567.	24751.	38896.	41678.	42738.	42478.
4.786E-07	8678.	10237.	12531.	15851.	4.786E-07	18567.	24751.	38896.	41678.	42738.	42478.
4.365E-07	8678.	10237.	12531.	15851.	4.365E-07	18567.	24751.	38896.	41678.	42738.	42478.
3.981E-07	8678.	10237.	12531.	15851.	3.981E-07	18567.	24751.	38896.	41719.	42738.	42478.
3.631E-07	8678.	10237.	12531.	15851.	3.631E-07	18567.	24751.	38896.	41720.	42738.	42478.
3.311E-07	8678.	10237.	12531.	15851.	3.311E-07	18567.	24751.	38896.	41720.	42738.	42478.
3.020E-07	8678.	10237.	12531.	15851.	3.020E-07	18567.	24751.	38896.	41720.	42738.	42478.
2.754E-07	8678.	10237.	12531.	15851.	2.754E-07	18567.	24751.	38896.	41720.	42738.	42478.
2.512E-07	8678.	10237.	12531.	15851.	2.512E-07	18567.	24751.	38896.	41720.	42738.	42478.
2.291E-07	8678.	10237.	12531.	15851.	2.291E-07	18567.	24751.	38896.	41720.	42738.	42478.
2.089E-07	8678.	10237.	12531.	15851.	2.089E-07	18567.	24751.	38896.	41720.	42738.	42478.
1.905E-07	8678.	10237.	12531.	15851.	1.905E-07	18567.	24751.	38896.	41720.	42738.	42478.
1.738E-07	8678.	10237.	12531.	15851.	1.738E-07	18567.	24751.	38896.	41720.	42738.	42478.
1.585E-07	8678.	10237.	12531.	15851.	1.585E-07	18567.	24751.	38896.	41720.	42738.	42478.
1.445E-07	8678.	10237.	12531.	15851.	1.445E-07	18567.	24751.	38896.	41720.	42738.	42478.
1.318E-07	8678.	10237.	12531.	15851.	1.318E-07	18567.	24751.	38896.	41720.	42738.	42478.
1.202E-07	8678.	10237.	12531.	15851.	1.202E-07	18567.	24751.	38896.	41720.	42738.	42478.
1.096E-07	8678.	10237.	12531.	15851.	1.096E-07	18567.	24751.	38896.	41720.	42738.	42478.
1.000E-07	8678.	10237.	12531.	15851.	1.000E-07	18567.	24751.	38896.	41720.	42738.	42478.
Belw. Lim.	0.	0.	0.	0.	Belw. Lim.	0.	0.	0.	0.	0.	0.

Program Title: ARCON96.

Developed For: U.S. Nuclear Regulatory Commission
Office of Nuclear Reactor Regulation
Division of Reactor Program Management

Date: June 25, 1997 11:00 a.m.

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Code Documentation: NUREG/CR-6331 Rev. 1

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Program Run 9/ 9/2004 at 13:08:08

******* ARCON INPUT **********

Number of Meteorological Data Files = 5
Meteorological Data File Names
C:\TRACI'~1\PEACHB~1\BYRON\QDC95R1A.MET
C:\TRACI'~1\PEACHB~1\BYRON\QDC96R1A.MET
C:\TRACI'~1\PEACHB~1\BYRON\QDC97R1A.MET
C:\TRACI'~1\PEACHB~1\BYRON\QDC98R1A.MET
C:\TRACI'~1\PEACHB~1\BYRON\QDC99R1A.MET

Height of lower wind instrument (m) = 10.1
Height of upper wind instrument (m) = 59.7
Wind speeds entered as miles per hour

Ground-level release
Release height (m) = 48.6
Building Area (m^2) = 2696.3
Effluent vertical velocity (m/s) = .00
Vent or stack flow (m^3/s) = .00
Vent or stack radius (m) = .00

Direction .. intake to source (deg) = 018
Wind direction sector width (deg) = 90
Wind direction window (deg) = 333 - 063
Distance to intake (m) = 94.5

Intake height (m) = 8.8
Terrain elevation difference (m) = .0

Output file names
7QDC.log
7QDC.cfd

Minimum Wind Speed (m/s) = .5
Surface roughness length (m) = .20
Sector averaging constant = 4.3

Initial value of sigma y = .00
Initial value of sigma z = .00

Expanded output for code testing not selected

Total number of hours of data processed = 43824
Hours of missing data = 341
Hours direction in window = 8014
Hours elevated plume w/ dir. in window = 0
Hours of calm winds = 664
Hours direction not in window or calm = 34805

DISTRIBUTION SUMMARY DATA BY AVERAGING INTERVAL

AVER. PER.	1	2	4	8	12	24	96	168	360	720
UPPER LIM.	1.00E-03	1.00E-03	1.00E-03	1.00E-03	1.00E-03	1.00E-03	1.00E-03	1.00E-03	1.00E-03	1.00E-03
LOW LIM.	1.00E-07	1.00E-07	1.00E-07	1.00E-07	1.00E-07	1.00E-07	1.00E-07	1.00E-07	1.00E-07	1.00E-07
ABOVE RANGE	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
IN RANGE	8678.	10237.	12531.	15851.	18567.	24751.	38896.	41720.	42738.	42478.
BELOW RANGE	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
ZERO	34805.	33209.	30841.	27373.	24682.	18374.	3801.	893.	134.	0.
TOTAL X/Qs	43483.	43446.	43372.	43224.	43249.	43125.	42697.	42613.	42872.	42478.
% NON ZERO	19.96	23.56	28.89	36.67	42.93	57.39	91.10	97.90	99.69	100.00

95th PERCENTILE X/Q VALUES

5.82E-04	5.63E-04	5.28E-04	4.78E-04	3.90E-04	2.84E-04	1.54E-04	1.25E-04	1.02E-04	8.73E-05

95% X/Q for standard averaging intervals

0 to 2 hours	5.82E-04
2 to 8 hours	4.43E-04
8 to 24 hours	1.87E-04
1 to 4 days	1.10E-04
4 to 30 days	7.71E-05

HOURLY VALUE RANGE

	MAX X/Q	MIN X/Q
CENTERLINE	7.96E-04	4.66E-05
SECTOR-AVERAGE	4.64E-04	2.71E-05

NORMAL PROGRAM COMPLETION

PAVAN Input and Output

(Output has been shortened to include only the input cards and X/Q summary)

Unit 1 and 2 MSIV to EAB and LPZ

```
   1  1111
Quad Cities                                  Ground Release
10.1 meters          10.1-59.7 meters

QDC, Ground Release, EAB and LPZ, Units 1 & 2 MSIV, Revision 1 met data
    7    0
1564. 43.7 10.0 10.1
    0    0    0    0    0    0    0
   0.   0.   1.   0.   0.   0.   0.   3.   0.   0.   0.   1.   1.   2.   1.   1.
  78.  68.  48.  50.  27.  24.  52. 134.  99. 255. 192. 170. 261. 211. 186. 111.
  71.  63.  72.  47.  26.  67.  63.  95.  70. 158. 111.  55. 204. 226. 237. 156.
   6.   4.   6.  12.   2.  17.   7.   4.   7.   3.   1.   1.  16.  39.  18.   8.
   0.   0.   0.   1.   0.   1.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.
   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.
   0.   2.   0.   0.   1.   0.   0.   0.   1.   0.   1.   1.   3.   3.   5.   0.
  29.  26.  32.  30.  19.  28.  33.  55.  33.  55.  58.  56.  58.  57.  45.  47.
  16.  12.  23.  22.  23.  19.  16.   8.   5.  16.  20.  17.  39.  37.  27.  23.
   3.   5.   0.   1.   3.   4.   0.   0.   0.   0.   0.   3.   6.  13.   3.   2.
   0.   0.   0.   1.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.
   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.
   1.   2.   3.   6.   6.   7.   1.   2.   5.   7.  10.  11.  14.  12.   6.   4.
  63.  60.  62.  52.  54.  75.  78. 108.  64. 142. 154. 116. 125. 122. 112.  69.
  44.  20.  37.  38.  33.  39.  24.  18.  16.  30.  29.  33. 100.  67.  75.  34.
   3.   5.   1.   3.   6.   6.   4.   1.   1.   0.   5.   1.  29.  29.   5.   3.
   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.
   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.
  95.  65.  86. 115. 118. 102. 115. 114.  97. 100. 154. 166. 176. 142. 146.  75.
 409. 293. 460. 561. 586. 449. 416. 405. 272. 365. 485. 454. 754. 889. 687. 367.
 322. 213. 375. 440. 341. 260. 160.  77.  73. 142. 217. 244. 643. 891. 473. 205.
  61.  50.  84.  87.  35.  66.  27.  13.   2.   7.  17.  33. 170. 229.  83.  17.
   1.   0.   1.   2.   1.   2.   0.   0.   0.   1.  16.  10.  11.   7.   0.   0.
   0.   0.   0.   0.   0.   1.   0.   0.   0.   0.   0.   1.   0.   0.   0.   0.
 148. 144. 190. 227. 275. 216. 258. 256. 211. 184. 251. 302. 297. 314. 243. 170.
 325. 167. 324. 398. 373. 429. 411. 381. 394. 498. 665. 471. 654. 560. 552. 368.
  52.  38.  68. 133.  98. 144.  99.  96. 121. 190. 193.  77.  63. 101.  76.  38.
   1.   1.   6.   7.  11.  18.  10.   9.   7.   3.   7.   1.   4.   5.   3.   2.
   0.   0.   0.   0.   1.   3.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.
   0.   0.   0.   0.   0.   3.   0.   0.   0.   0.   0.   0.   1.   0.   0.   0.
 131. 143. 177. 184. 319. 391. 311. 313. 231. 180. 137. 131. 213. 281. 172. 129.
  23.  21.  40.  48.  69. 201. 132. 103.  79.  94.  40.  14.  49.  38.  38.  25.
   0.   1.   0.  51.   0.   4.   1.   1.   3.   7.   1.   0.   0.   1.   0.   0.
   0.   0.   0.   0.   0.   1.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.
   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.
   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.
  72. 101. 108. 155. 480. 552. 278. 198. 129.  85.  77.  81. 128. 181.  78.  67.
   1.   8.   2.   2.  36. 155.  28.  11.   7.   3.   1.   0.   6.  18.   4.   2.
   0.   0.   0. 234.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.
   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.
   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.
   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.
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 101. 0.75 3.50 7.50 12.5 18.5 24.0 55.0
 380. 380. 380. 380. 380. 380. 380. 380. 380. 380. 380. 380. 380. 380. 380. 380.
4828.4828.4828.4828.4828.4828.4828.4828.4828.4828.4828.4828.4828.4828.4828.4828.
   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.
   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.
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USNRC COMPUTER CODE-PAVAN, VERSION 2.0 RUN DATE: 09/13/04

PRINTOUT OF INPUT CARDS

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   1     00010 01111 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000   2     Quad Cities
Ground Release
   3     10.1 meters         10.1-59.7 meters
   4
   5     QDC, Ground Release, EAB and LPZ, Units 1 & 2 MSIV, Revision 1 met data            6          7 43178     0
   7          0.500  1564.000    43.700    10.000    10.100
   8       0.000  0.000  0.000  0.000  0.000  0.000  0.000
   9       0.000  0.000  1.000  0.000  0.000  0.000  0.000  3.000  0.000  0.000  0.000  1.000  1.000  2.000  1.000  1.000
   9      78.000 68.000 48.000 50.000 27.000 24.000 52.000134.000 99.000255.000192.000170.000261.000211.000186.000111.000
   9      71.000 63.000 72.000 47.000 26.000 67.000 63.000 95.000 70.000158.000111.000 55.000204.000226.000237.000156.000
   9       6.000  4.000  6.000 12.000  2.000 17.000  7.000  4.000  7.000  3.000  1.000  1.000 16.000 39.000 18.000  8.000
   9       0.000  0.000  0.000  1.000  0.000  1.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000
   9       0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000
   9       0.000  2.000  0.000  0.000  1.000  0.000  0.000  0.000  1.000  0.000  1.000  1.000  3.000  3.000  5.000  0.000
   9      29.000 26.000 32.000 30.000 19.000 28.000 33.000 55.000 33.000 55.000 58.000 56.000 58.000 57.000 45.000 47.000
   9      16.000 12.000 23.000 22.000 23.000 19.000 16.000  8.000  5.000 16.000 20.000 17.000 39.000 37.000 27.000 23.000
   9       3.000  5.000  0.000  1.000  3.000  4.000  0.000  0.000  0.000  0.000  0.000  3.000  6.000 13.000  3.000  2.000
   9       0.000  0.000  0.000  1.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000
   9       0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000
   9       1.000  2.000  3.000  6.000  6.000  7.000  1.000  2.000  5.000  7.000 10.000 11.000 14.000 12.000  6.000  4.000
   9      63.000 60.000 62.000 52.000 54.000 75.000 78.000108.000 64.000142.000154.000116.000125.000122.000112.000 69.000
   9      44.000 20.000 37.000 38.000 33.000 39.000 24.000 18.000 16.000 30.000 29.000 33.000100.000 67.000 75.000 34.000
   9       3.000  5.000  1.000  3.000  6.000  6.000  4.000  1.000  1.000  0.000  5.000  1.000 29.000 29.000  5.000  3.000
   9       0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000
   9       0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000
   9      95.000 65.000 86.000115.000118.000102.000115.000114.000 97.000100.000154.000166.000176.000142.000146.000 75.000
   9     409.000293.000460.000561.000586.000449.000416.000405.000272.000365.000485.000454.000754.000889.000687.000367.000
   9     322.000213.000375.000440.000341.000260.000160.000 77.000 73.000142.000217.000244.000643.000891.000473.000205.000
   9      61.000 50.000 84.000 87.000 35.000 66.000 27.000 13.000  2.000  7.000 17.000 33.000170.000229.000 83.000 17.000
   9       1.000  0.000  1.000  2.000  1.000  2.000  0.000  0.000  0.000  1.000 16.000 10.000 11.000  7.000  0.000  0.000
   9       0.000  0.000  0.000  0.000  0.000  1.000  0.000  0.000  0.000  0.000  0.000  1.000  0.000  0.000  0.000  0.000
   9     148.000144.000190.000227.000275.000216.000258.000256.000211.000184.000251.000302.000297.000314.000243.000170.000
   9     325.000167.000324.000398.000373.000429.000411.000381.000394.000498.000665.000471.000654.000560.000552.000368.000
   9      52.000 38.000 68.000133.000 98.000144.000 99.000 96.000121.000190.000193.000 77.000 63.000101.000 76.000 38.000
   9       1.000  1.000  6.000  7.000 11.000 18.000 10.000  9.000  7.000  3.000  7.000  1.000  4.000  5.000  3.000  2.000
   9       0.000  0.000  0.000  0.000  1.000  3.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000
   9       0.000  0.000  0.000  0.000  0.000  3.000  0.000  0.000  0.000  0.000  0.000  0.000  1.000  0.000  0.000  0.000
   9     131.000143.000177.000184.000319.000391.000311.000313.000231.000180.000137.000131.000213.000281.000172.000129.000
   9      23.000 21.000 40.000 48.000 69.000201.000132.000103.000 79.000 94.000 40.000 14.000 49.000 38.000 38.000 25.000
   9       0.000  1.000  0.000 51.000  0.000  4.000  1.000  1.000  3.000  7.000  1.000  0.000  0.000  1.000  0.000  0.000
   9       0.000  0.000  0.000  0.000  0.000  1.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000
   9       0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000
   9       0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000
   9      72.000101.000108.000155.000480.000552.000278.000198.000129.000 85.000 77.000 81.000128.000181.000 78.000 67.000
   9       1.000  8.000  2.000  2.000 36.000155.000 28.000 11.000  7.000  3.000  1.000  0.000  6.000 18.000  4.000  2.000
   9       0.000  0.000  0.000234.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000
   9       0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000
   9       0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000
   9       0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  10        101.  0.750  3.500
7.500 12.500 18.500 24.000 55.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  11        380.   380.   380.   380.   380.   380.   380.   380.   380.
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380.   380.   380.   380.   380.   380.   380.  11        4828.  4828.  4828.  4828.  4828.  4828.  4828.  4828.  4828.  4828.  4828.  4828.  4828.  4828.
4828.  4828.  12          1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0
 12          1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0
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USNRC COMPUTER CODE-PAVAN, VERSION 2.0 RUN DATE: 09/13/04

PLANT NAME: Quad Cities METEOROLOGICAL INSTRUMENTATION
DATA PERIOD: WIND SENSORS HEIGHT: 10.1 meters
TYPE OF RELEASE: Ground Release DELTA-T HEIGHTS: 10.1-59.7 meters
SOURCE OF DATA:
COMMENTS: QDC, Ground Release, EAB and LPZ, Units 1 & 2 MSIV, Revision 1 met data
PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145

RELATIVE CONCENTRATION (X/Q) VALUES (SEC/CUBIC METER)
VERSUS
AVERAGING TIME

DOWNWIND SECTOR	DISTANCE (METERS)	0-2 HOURS	0-8 HOURS	8-24 HOURS	1-4 DAYS	4-30 DAYS	ANNUAL AVERAGE	HOURS PER YEAR MAX 0-2 HR X/Q IS EXCEEDED IN SECTOR	DOWNWIND SECTOR
S	380.	4.82E-04	2.40E-04	1.70E-04	7.96E-05	2.69E-05	7.12E-06	3.1	S
SSW	380.	5.39E-04	2.61E-04	1.82E-04	8.29E-05	2.68E-05	6.73E-06	5.3	SSW
SW	380.	5.69E-04	2.86E-04	2.03E-04	9.60E-05	3.28E-05	8.84E-06	5.1	SW
WSW	380.	6.69E-04	3.44E-04	2.46E-04	1.19E-04	4.23E-05	1.19E-05	7.1	WSW
W	380.	1.36E-03	6.68E-04	4.69E-04	2.18E-04	7.22E-05	1.87E-05	43.7	W
WNW	380.	9.80E-04	5.22E-04	3.81E-04	1.92E-04	7.21E-05	2.17E-05	10.5	WNW
NW	380.	8.73E-04	4.44E-04	3.17E-04	1.52E-04	5.30E-05	1.46E-05	17.3	NW
NNW	380.	7.41E-04	3.79E-04	2.71E-04	1.31E-04	4.60E-05	1.28E-05	9.4	NNW
N	380.	6.26E-04	3.14E-04	2.23E-04	1.05E-04	3.61E-05	9.71E-06	5.4	N
NNE	380.	5.44E-04	2.77E-04	1.98E-04	9.51E-05	3.33E-05	9.19E-06	3.1	NNE
NE	380.	4.99E-04	2.61E-04	1.89E-04	9.35E-05	3.41E-05	9.91E-06	3.4	NE
ENE	380.	4.96E-04	2.57E-04	1.85E-04	9.10E-05	3.27E-05	9.38E-06	4.0	ENE
E	380.	6.17E-04	3.28E-04	2.39E-04	1.20E-04	4.47E-05	1.34E-05	5.9	E
ESE	380.	7.14E-04	3.79E-04	2.76E-04	1.39E-04	5.17E-05	1.55E-05	8.5	ESE
SE	380.	5.32E-04	2.78E-04	2.01E-04	9.96E-05	3.63E-05	1.05E-05	2.7	SE
SSE	380.	4.75E-04	2.36E-04	1.67E-04	7.82E-05	2.64E-05	6.98E-06	2.7	SSE
MAX X/Q		1.36E-03				TOTAL HOURS AROUND SITE:		137.3	
SRP 2.3.4	380.	1.83E-03	8.80E-04	6.10E-04	2.75E-04	8.78E-05	2.17E-05		
SITE LIMIT		8.57E-04	4.67E-04	3.44E-04	1.78E-04	6.91E-05	2.17E-05		

0.5 PERCENT X/Q TO AN INDIVIDUAL IS LIMITING.

NOTE: VALUES ON THIS PAGE ARE APPROXIMATIONS ONLY.
CHECK THE REASONABLENESS OF THE ENVELOPES
COMPUTED FOR THE 0-2 HOUR VALUES. FOR ANY
FAULTY ENVELOPES, ADJUST THE ABOVE VALUES.

USNRC COMPUTER CODE-PAVAN, VERSION 2.0 RUN DATE: 09/13/04

PLANT NAME: Quad Cities
DATA PERIOD:
TYPE OF RELEASE: Ground Release
SOURCE OF DATA:
COMMENTS: QDC, Ground Release, EAB and LPZ, Units 1 & 2 MSIV, Revision 1 met data
PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145

METEOROLOGICAL INSTRUMENTATION
WIND SENSORS HEIGHT: 10.1 meters
DELTA-T HEIGHTS: 10.1-59.7 meters

RELATIVE CONCENTRATION (X/Q) VALUES (SEC/CUBIC METER)
VERSUS
AVERAGING TIME

DOWNWIND SECTOR	DISTANCE (METERS)	0-2 HOURS	0-8 HOURS	8-24 HOURS	1-4 DAYS	4-30 DAYS	ANNUAL AVERAGE	HOURS PER YEAR MAX 0-2 HR X/Q IS EXCEEDED IN SECTOR	DOWNWIND SECTOR
S	4828.	2.31E-05	1.01E-05	6.67E-06	2.72E-06	7.50E-07	1.55E-07	3.1	S
SSW	4828.	2.71E-05	1.14E-05	7.43E-06	2.91E-06	7.58E-07	1.46E-07	5.3	SSW
SW	4828.	2.93E-05	1.28E-05	8.45E-06	3.43E-06	9.42E-07	1.94E-07	5.1	SW
WSW	4828.	3.85E-05	1.68E-05	1.11E-05	4.54E-06	1.25E-06	2.59E-07	5.0	WSW
W	4828.	1.04E-04	4.14E-05	2.62E-05	9.69E-06	2.32E-06	4.05E-07	43.7	W
WNW	4828.	9.74E-05	4.03E-05	2.59E-05	9.96E-06	2.52E-06	4.69E-07	40.4	WNW
NW	4828.	5.46E-05	2.34E-05	1.53E-05	6.08E-06	1.62E-06	3.21E-07	17.3	NW
NNW	4828.	4.30E-05	1.87E-05	1.24E-05	5.01E-06	1.37E-06	2.81E-07	9.4	NNW
N	4828.	3.37E-05	1.46E-05	9.62E-06	3.89E-06	1.06E-06	2.16E-07	5.4	N
NNE	4828.	2.75E-05	1.22E-05	8.11E-06	3.35E-06	9.44E-07	2.00E-07	3.1	NNE
NE	4828.	2.42E-05	1.11E-05	7.53E-06	3.23E-06	9.59E-07	2.17E-07	3.4	NE
ENE	4828.	2.40E-05	1.09E-05	7.37E-06	3.14E-06	9.20E-07	2.05E-07	4.0	ENE
E	4828.	3.30E-05	1.51E-05	1.02E-05	4.35E-06	1.28E-06	2.89E-07	5.9	E
ESE	4828.	4.07E-05	1.84E-05	1.24E-05	5.23E-06	1.52E-06	3.34E-07	8.5	ESE
SE	4828.	2.66E-05	1.21E-05	8.18E-06	3.48E-06	1.02E-06	2.28E-07	2.7	SE
SSE	4828.	2.25E-05	9.87E-06	6.53E-06	2.66E-06	7.35E-07	1.52E-07	2.7	SSE
MAX X/Q		1.04E-04				TOTAL HOURS AROUND SITE:		165.1	
SRP 2.3.4	4828.	9.92E-05	4.09E-05	2.63E-05	1.01E-05	2.53E-06	4.69E-07		
SITE LIMIT		5.32E-05	2.43E-05	1.65E-05	7.04E-06	2.08E-06	4.69E-07		

0.5 PERCENT X/Q TO AN INDIVIDUAL IS LIMITING.

NOTE: VALUES ON THIS PAGE ARE APPROXIMATIONS ONLY.
CHECK THE REASONABLENESS OF THE ENVELOPES
COMPUTED FOR THE 0-2 HOUR VALUES. FOR ANY
FAULTY ENVELOPES, ADJUST THE ABOVE VALUES.

Station Chimney to EAB and LPZ (No Terrain)

```
  1  1111
Quad Cities                                  Elevated Release
90.2 meters          10.1-90.2 meters

QDC, Elevated Release, EAB and LPZ, Station Chimney, Revision 1 met data
    7    0
1564. 43.7 94.6 90.2
    0    0    0    0    0    0    0
   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.
   4.   5.   4.   8.   2.   1.   3.   6.   5.   9.  10.  20.  18.  29.  23.  12.
  33.  45.  30.  25.  12.   9.  28.  57.  28.  90.  49.  47.  78.  59.  72.  73.
  20.  23.  28.  11.   5.  11.  28.  62.  69. 120.  24.  32.  47.  87. 102.  60.
   1.   3.   4.   5.   0.   5.   9.  21.  29.  35.   5.   3.  11.  44.  37.   9.
   1.   0.   2.   2.   0.   1.   0.   4.   3.  16.   0.   0.   2.   6.   8.   0.
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  22.  21.  22.  29.  17.  20.  16.  23.  18.  42.  46.  37.  48.  42.  31.  31.
  46.  53.  54.  29.  24.  41.  44.  69.  45.  99.  57.  64.  70.  65.  72.  53.
  15.  15.  25.  11.  12.  18.  29.  39.  26.  64.  39.  34.  72.  65.  58.  57.
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  43.  54.  50.  31.  37.  39.  53.  69.  41.  93.  49.  60.  76.  69.  59.  61.
  23.  15.  33.  26.  20.  34.  33.  37.  32.  50.  43.  49.  78.  73.  76.  40.
   9.   6.   5.  13.   9.  12.   7.  12.  12.  28.  12.  12.  38.  47.  29.   9.
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 337. 258. 353. 384. 330. 225. 251. 204. 236. 274. 244. 291. 578. 914. 678. 329.
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 209. 131. 158. 194. 162. 282. 301. 329. 408. 468. 438. 287. 348. 397. 308. 243.
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  14.  19.  13.  17.  12.   6.   7.   9.  11.   9.   8.  14.  13.  15.   8.   8.
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 104.  75.  99.  80.  95. 113. 122. 205. 166. 179. 104.  72.  61.  60.  80. 108.
  54.  38.  47.  44.  40. 154. 234. 243. 255. 259.  92.  45.  63.  78.  57.  50.
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  10.  11.   9.  14.  14.  10.   7.  11.   8.  11.   5.   1.   9.   7.   2.   8.
  23.  27.  26.  31.  24.  33.  45.  20.  39.  40.  44.  26.  28.  15.  12.  23.
  30.  23.  29.  28.  24.  48.  76.  99.  89.  88.  64.  23.  39.  27.  25.  16.
  15.  10.  10.   0.   5.  22.  74. 115.  91. 119.  30.   8.   9.  12.   9.  13.
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USNRC COMPUTER CODE-PAVAN, VERSION 2.0 RUN DATE: 09/13/04

PRINTOUT OF INPUT CARDS

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   1     00010 01111 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000   2     Quad Cities
Elevated Releas
   3     90.2 meters         10.1-90.2 meters
   4
   5     QDC, Elevated Release, EAB and LPZ, Station Chimney, Revision 1 met data          6          7 42727     0
   7          0.500  1564.000    43.700    94.600    90.200
   8       0.000  0.000  0.000  0.000  0.000  0.000  0.000
   9       0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000
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   9      33.000 45.000 30.000 25.000 12.000  9.000 28.000 57.000 28.000 90.000 49.000 47.000 78.000 59.000 72.000 73.000
   9      20.000 23.000 28.000 11.000  5.000 11.000 28.000 62.000 69.000120.000 24.000 32.000 47.000 87.000102.000 60.000
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   9      22.000 21.000 22.000 29.000 17.000 20.000 16.000 23.000 18.000 42.000 46.000 37.000 48.000 42.000 31.000 31.000
   9      46.000 53.000 54.000 29.000 24.000 41.000 44.000 69.000 45.000 99.000 57.000 64.000 70.000 65.000 72.000 53.000
   9      15.000 15.000 25.000 11.000 12.000 18.000 29.000 39.000 26.000 64.000 39.000 34.000 72.000 65.000 58.000 57.000
   9       6.000  4.000  2.000 11.000  5.000 12.000  6.000  9.000 11.000 27.000 14.000  3.000 26.000 32.000 25.000  5.000
   9       0.000  1.000  1.000  3.000  0.000  2.000  1.000  3.000  3.000  6.000  4.000  1.000  7.000 11.000  8.000  2.000
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   9      42.000 28.000 34.000 33.000 38.000 28.000 30.000 42.000 30.000 64.000 65.000 40.000 56.000 63.000 65.000 53.000
   9      43.000 54.000 50.000 31.000 37.000 39.000 53.000 69.000 41.000 93.000 49.000 60.000 76.000 69.000 59.000 61.000
   9      23.000 15.000 33.000 26.000 20.000 34.000 33.000 37.000 32.000 50.000 43.000 49.000 78.000 73.000 76.000 40.000
   9       9.000  6.000  5.000 13.000  9.000 12.000  7.000 12.000 12.000 28.000 12.000 12.000 38.000 47.000 29.000  9.000
   9       1.000  1.000  0.000  4.000  2.000  5.000  0.000  0.000  5.000 16.000  3.000  1.000 17.000 22.000  8.000  3.000
   9      36.000 19.000 25.000 30.000 29.000 31.000 29.000 34.000 26.000 29.000 38.000 28.000 41.000 29.000 36.000 24.000
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   9     337.000258.000353.000384.000330.000225.000251.000204.000236.000274.000244.000291.000578.000914.000678.000329.000
   9      73.000107.000215.000234.000 99.000152.000103.000 98.000116.000164.000131.000112.000338.000485.000325.000109.000
   9      25.000 26.000 71.000 78.000 16.000 62.000 43.000 59.000 71.000 64.000 51.000 48.000233.000307.000113.000 19.000
   9      20.000 14.000  5.000 17.000 23.000 22.000 12.000  5.000 18.000 12.000 15.000 16.000  6.000  5.000 13.000 16.000
   9      77.000 75.000 88.000 88.000149.000 76.000 78.000 78.000 69.000 76.000 81.000 59.000 67.000 70.000 74.000 90.000
   9     187.000159.000169.000182.000255.000211.000198.000219.000205.000264.000201.000168.000208.000204.000236.000247.000
   9     209.000131.000158.000194.000162.000282.000301.000329.000408.000468.000438.000287.000348.000397.000308.000243.000
   9      13.000  8.000 27.000 46.000 20.000 89.000 95.000145.000237.000310.000173.000 49.000 69.000 51.000 25.000 10.000
   9       1.000  0.000  4.000  6.000  4.000 24.000 14.000 61.000 85.000 99.000 24.000  5.000  4.000  3.000  0.000  1.000
   9      14.000 19.000 13.000 17.000 12.000  6.000  7.000  9.000 11.000  9.000  8.000 14.000 13.000 15.000  8.000  8.000
   9      46.000 48.000 52.000 62.000 72.000 57.000 46.000 50.000 46.000 22.000 48.000 33.000 45.000 20.000 41.000 52.000
   9     104.000 75.000 99.000 80.000 95.000113.000122.000205.000166.000179.000104.000 72.000 61.000 60.000 80.000108.000
   9      54.000 38.000 47.000 44.000 40.000154.000234.000243.000255.000259.000 92.000 45.000 63.000 78.000 57.000 50.000
   9       1.000  0.000  3.000  2.000  0.000 26.000 38.000 29.000 28.000 31.000 15.000  2.000  3.000  7.000  2.000  2.000
   9       0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  2.000  0.000  0.000  0.000  0.000  0.000  0.000
   9      10.000 11.000  9.000 14.000 14.000 10.000  7.000 11.000  8.000 11.000  5.000  1.000  9.000  7.000  2.000  8.000
   9      23.000 27.000 26.000 31.000 24.000 33.000 45.000 20.000 39.000 40.000 44.000 26.000 28.000 15.000 12.000 23.000
   9      30.000 23.000 29.000 28.000 24.000 48.000 76.000 99.000 89.000 88.000 64.000 23.000 39.000 27.000 25.000 16.000
   9      15.000 10.000 10.000  0.000  5.000 22.000 74.000115.000 91.000119.000 30.000  8.000  9.000 12.000  9.000 13.000
   9       1.000  0.000  0.000  0.000  1.000  6.000 12.000  6.000  3.000  6.000  1.000  1.000  0.000  1.000  0.000  0.000
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4828.  4828.  12          1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0
  12          1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0
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USNRC COMPUTER CODE-PAVAN, VERSION 2.0 RUN DATE: 09/13/04

PLANT NAME: Quad Cities
DATA PERIOD:
TYPE OF RELEASE: Elevated Releas
SOURCE OF DATA:
COMMENTS: QDC, Elevated Release, EAB and LPZ, Station Chimney, Revision 1 met data
PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145

METEOROLOGICAL INSTRUMENTATION
WIND SENSORS HEIGHT: 90.2 meters
DELTA-T HEIGHTS: 10.1-90.2 meters

RELATIVE CONCENTRATION (X/Q) VALUES (SEC/CUBIC METER)
VERSUS
AVERAGING TIME

DOWNWIND SECTOR	DISTANCE (METERS)	0-2 HOURS	0-8 HOURS	8-24 HOURS	1-4 DAYS	4-30 DAYS	ANNUAL AVERAGE	HOURS PER YEAR MAX 0-2 HR X/Q IS EXCEEDED IN SECTOR	DOWNWIND SECTOR
S	380.	3.51E-06	1.38E-06	8.69E-07	3.17E-07	7.45E-08	1.27E-08	24.3	S
SSW	380.	3.32E-06	1.37E-06	8.77E-07	3.35E-07	8.43E-08	1.56E-08	20.3	SSW
SW	380.	3.33E-06	1.34E-06	8.54E-07	3.19E-07	7.75E-08	1.37E-08	20.3	SW
WSW	380.	3.35E-06	1.31E-06	8.24E-07	2.99E-07	6.98E-08	1.18E-08	22.9	WSW
W	380.	3.36E-06	1.18E-06	6.96E-07	2.23E-07	4.35E-08	5.88E-09	18.8	W
WNW	380.	3.28E-06	1.20E-06	7.22E-07	2.42E-07	5.01E-08	7.33E-09	19.2	WNW
NW	380.	3.51E-06	1.41E-06	8.97E-07	3.34E-07	8.10E-08	1.43E-08	23.4	NW
NNW	380.	4.14E-06	1.82E-06	1.20E-06	4.91E-07	1.36E-07	2.81E-08	36.4	NNW
N	380.	3.30E-06	1.42E-06	9.29E-07	3.71E-07	9.94E-08	1.98E-08	19.2	N
NNE	380.	4.43E-06	2.06E-06	1.40E-06	6.10E-07	1.85E-07	4.27E-08	41.0	NNE
NE	380.	4.30E-06	1.78E-06	1.14E-06	4.39E-07	1.11E-07	2.06E-08	37.6	NE
ENE	380.	3.96E-06	1.70E-06	1.11E-06	4.44E-07	1.19E-07	2.37E-08	32.3	ENE
E	380.	4.50E-06	1.99E-06	1.33E-06	5.49E-07	1.54E-07	3.27E-08	43.7	E
ESE	380.	4.40E-06	2.02E-06	1.37E-06	5.87E-07	1.74E-07	3.95E-08	40.7	ESE
SE	380.	4.42E-06	2.03E-06	1.38E-06	5.94E-07	1.77E-07	4.04E-08	40.8	SE
SSE	380.	4.13E-06	1.81E-06	1.20E-06	4.93E-07	1.37E-07	2.86E-08	33.3	SSE
MAX X/Q		4.50E-06				TOTAL HOURS AROUND SITE:		474.4	
SRP 2.3.4	380.	4.73E-06	2.17E-06	1.47E-06	6.33E-07	1.88E-07	4.27E-08		
SITE LIMIT		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.27E-08		

THE FIVE-PERCENT-FOR-THE-ENTIRE-SITE X/Q IS LIMITING.

X/Q VALUES (SEC/CUBIC METER) FOR FUMIGATION AT THE BOUNDARY:

DOWNWIND SECTOR	DISTANCE (METERS)	FUMIGATION X/Q
S	380.	1.37E-04
SSW	380.	1.37E-04
SW	380.	1.37E-04
WSW	380.	1.37E-04
W	380.	1.38E-04
WNW	380.	1.39E-04
NW	380.	1.41E-04
NNW	380.	1.43E-04
N	380.	1.37E-04
NNE	380.	1.37E-04
NE	380.	1.37E-04
ENE	380.	1.37E-04
E	380.	1.37E-04
ESE	380.	1.37E-04
SE	380.	1.37E-04
SSE	380.	1.37E-04

NOTE: VALUES ON THIS PAGE ARE APPROXIMATIONS ONLY.
CHECK THE REASONABLENESS OF THE ENVELOPES
COMPUTED FOR THE 0-2 HOUR VALUES. FOR ANY
FAULTY ENVELOPES, ADJUST THE ABOVE VALUES.

USNRC COMPUTER CODE-PAVAN, VERSION 2.0 RUN DATE: 09/13/04

PLANT NAME: Quad Cities
DATA PERIOD:
TYPE OF RELEASE: Elevated Releas
SOURCE OF DATA:
COMMENTS: QDC, Elevated Release, EAB and LPZ, Station Chimney, Revision 1 met data
PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145

METEOROLOGICAL INSTRUMENTATION
WIND SENSORS HEIGHT: 90.2 meters
DELTA-T HEIGHTS: 10.1-90.2 meters

RELATIVE CONCENTRATION (X/Q) VALUES (SEC/CUBIC METER)
VERSUS
AVERAGING TIME

DOWNWIND SECTOR	DISTANCE (METERS)	0-2 HOURS	0-8 HOURS	8-24 HOURS	1-4 DAYS	4-30 DAYS	ANNUAL AVERAGE	HOURS PER YEAR MAX 0-2 HR X/Q IS EXCEEDED IN SECTOR	DOWNWIND SECTOR
S	4828.	2.08E-06	9.75E-07	6.67E-07	2.92E-07	8.95E-08	2.10E-08	31.8	S
SSW	4828.	1.89E-06	8.68E-07	5.88E-07	2.53E-07	7.53E-08	1.71E-08	23.3	SSW
SW	4828.	1.97E-06	9.31E-07	6.40E-07	2.84E-07	8.85E-08	2.13E-08	25.1	SW
WSW	4828.	2.09E-06	9.96E-07	6.86E-07	3.06E-07	9.61E-08	2.33E-08	30.9	WSW
W	4828.	2.42E-06	1.15E-06	7.89E-07	3.51E-07	1.10E-07	2.65E-08	43.7	W
WNW	4828.	2.21E-06	1.04E-06	7.09E-07	3.12E-07	9.60E-08	2.27E-08	35.6	WNW
NW	4828.	2.20E-06	1.02E-06	6.99E-07	3.04E-07	9.24E-08	2.15E-08	34.9	NW
NNW	4828.	2.22E-06	1.04E-06	7.15E-07	3.16E-07	9.75E-08	2.32E-08	35.5	NNW
N	4828.	1.93E-06	9.09E-07	6.24E-07	2.76E-07	8.54E-08	2.04E-08	26.4	N
NNE	4828.	2.04E-06	9.88E-07	6.88E-07	3.14E-07	1.02E-07	2.56E-08	28.4	NNE
NE	4828.	2.10E-06	1.00E-06	6.90E-07	3.08E-07	9.69E-08	2.35E-08	31.9	NE
ENE	4828.	2.01E-06	9.48E-07	6.51E-07	2.88E-07	8.91E-08	2.12E-08	28.3	ENE
E	4828.	2.11E-06	1.04E-06	7.34E-07	3.41E-07	1.14E-07	2.97E-08	32.0	E
ESE	4828.	2.06E-06	1.05E-06	7.50E-07	3.62E-07	1.27E-07	3.52E-08	28.4	ESE
SE	4828.	2.18E-06	1.09E-06	7.70E-07	3.63E-07	1.23E-07	3.29E-08	33.7	SE
SSE	4828.	2.05E-06	9.73E-07	6.70E-07	2.98E-07	9.35E-08	2.26E-08	28.6	SSE
MAX X/Q		2.42E-06				TOTAL HOURS AROUND SITE:		498.3	
SRP 2.3.4	4828.	2.72E-06	1.32E-06	9.25E-07	4.24E-07	1.38E-07	3.52E-08		
SITE LIMIT		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.52E-08		

THE FIVE-PERCENT-FOR-THE-ENTIRE-SITE X/Q IS LIMITING.

X/Q VALUES (SEC/CUBIC METER) FOR FUMIGATION AT THE BOUNDARY:

DOWNWIND SECTOR	DISTANCE (METERS)	FUMIGATION X/Q
S	4828.	1.38E-05
SSW	4828.	1.38E-05
SW	4828.	1.38E-05
WSW	4828.	1.38E-05
W	4828.	1.39E-05
WNW	4828.	1.40E-05
NW	4828.	1.42E-05
NNW	4828.	1.44E-05
N	4828.	1.38E-05
NNE	4828.	1.38E-05
NE	4828.	1.38E-05
ENE	4828.	1.38E-05
E	4828.	1.38E-05
ESE	4828.	1.38E-05
SE	4828.	1.38E-05
SSE	4828.	1.38E-05

NOTE: VALUES ON THIS PAGE ARE APPROXIMATIONS ONLY.
CHECK THE REASONABLENESS OF THE ENVELOPES
COMPUTED FOR THE 0-2 HOUR VALUES. FOR ANY
FAULTY ENVELOPES, ADJUST THE ABOVE VALUES.

Station Chimney to EAB (Including Terrain)

```
   1  1111
Quad Cities                                   Elevated Release
90.2 meters          10.1-90.2 meters

QDC, Elevated Release, EAB and LPZ, Station Chimney, Revision 1 met data
    7    1
1564. 43.7 94.6 90.2
    0    0    0    0    0    0    0
   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.
   4.   5.   4.   8.   2.   1.   3.   6.   5.   9.  10.  20.  18.  29.  23.  12.
  33.  45.  30.  25.  12.   9.  28.  57.  28.  90.  49.  47.  78.  59.  72.  73.
  20.  23.  28.  11.   5.  11.  28.  62.  69. 120.  24.  32.  47.  87. 102.  60.
   1.   3.   4.   5.   0.   5.   9.  21.  29.  35.   5.   3.  11.  44.  37.   9.
   1.   0.   2.   2.   0.   1.   0.   4.   3.  16.   0.   0.   2.   6.   8.   0.
   0.   0.   0.   0.   1.   0.   1.   1.   0.   0.   0.   2.   1.   1.   2.   0.
  22.  21.  22.  29.  17.  20.  16.  23.  18.  42.  46.  37.  48.  42.  31.  31.
  46.  53.  54.  29.  24.  41.  44.  69.  45.  99.  57.  64.  70.  65.  72.  53.
  15.  15.  25.  11.  12.  18.  29.  39.  26.  64.  39.  34.  72.  65.  58.  57.
   6.   4.   2.  11.   5.  12.   6.   9.  11.  27.  14.   3.  26.  32.  25.   5.
   0.   1.   1.   3.   0.   2.   1.   3.   3.   6.   4.   1.   7.  11.   8.   2.
   0.   0.   0.   0.   0.   2.   1.   1.   0.   4.   3.   4.   4.   3.   1.   1.
  42.  28.  34.  33.  38.  28.  30.  42.  30.  64.  65.  40.  56.  63.  65.  53.
  43.  54.  50.  31.  37.  39.  53.  69.  41.  93.  49.  60.  76.  69.  59.  61.
  23.  15.  33.  26.  20.  34.  33.  37.  32.  50.  43.  49.  78.  73.  76.  40.
   9.   6.   5.  13.   9.  12.   7.  12.  12.  28.  12.  12.  38.  47.  29.   9.
   1.   1.   0.   4.   2.   5.   0.   0.   5.  16.   3.   1.  17.  22.   8.   3.
  36.  19.  25.  30.  29.  31.  29.  34.  26.  29.  38.  28.  41.  29.  36.  24.
 157. 128. 156. 170. 268. 186. 167. 153. 135. 180. 173. 174. 196. 172. 227. 175.
 295. 260. 334. 351. 391. 296. 229. 264. 182. 208. 246. 275. 340. 519. 505. 308.
 337. 258. 353. 384. 330. 225. 251. 204. 236. 274. 244. 291. 578. 914. 678. 329.
  73. 107. 215. 234.  99. 152. 103.  98. 116. 164. 131. 112. 338. 485. 325. 109.
  25.  26.  71.  78.  16.  62.  43.  59.  71.  64.  51.  48. 233. 307. 113.  19.
  20.  14.   5.  17.  23.  22.  12.   5.  18.  12.  15.  16.   6.   5.  13.  16.
  77.  75.  88.  88. 149.  76.  78.  78.  69.  76.  81.  59.  67.  70.  74.  90.
 187. 159. 169. 182. 255. 211. 198. 219. 205. 264. 201. 168. 208. 204. 236. 247.
 209. 131. 158. 194. 162. 282. 301. 329. 408. 468. 438. 287. 348. 397. 308. 243.
  13.   8.  27.  46.  20.  89.  95. 145. 237. 310. 173.  49.  69.  51.  25.  10.
   1.   0.   4.   6.   4.  24.  14.  61.  85.  99.  24.   5.   4.   3.   0.   1.
  14.  19.  13.  17.  12.   6.   7.   9.  11.   9.   8.  14.  13.  15.   8.   8.
  46.  48.  52.  62.  72.  57.  46.  50.  46.  22.  48.  33.  45.  20.  41.  52.
 104.  75.  99.  80.  95. 113. 122. 205. 166. 179. 104.  72.  61.  60.  80. 108.
  54.  38.  47.  44.  40. 154. 234. 243. 255. 259.  92.  45.  63.  78.  57.  50.
   1.   0.   3.   2.   0.  26.  38.  29.  28.  31.  15.   2.   3.   7.   2.   2.
   0.   0.   0.   0.   0.   0.   0.   0.   0.   2.   0.   0.   0.   0.   0.   0.
  10.  11.   9.  14.  14.  10.   7.  11.   8.  11.   5.   1.   9.   7.   2.   8.
  23.  27.  26.  31.  24.  33.  45.  20.  39.  40.  44.  26.  28.  15.  12.  23.
  30.  23.  29.  28.  24.  48.  76.  99.  89.  88.  64.  23.  39.  27.  25.  16.
  15.  10.  10.   0.   5.  22.  74. 115.  91. 119.  30.   8.   9.  12.   9.  13.
   1.   0.   0.   0.   1.   6.  12.   6.   3.   6.   1.   1.   0.   1.   0.   0.
   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.
 101. 0.75 3.50 7.50 12.5 18.5 24.0 55.0
 380. 380. 380. 380. 380. 380. 380. 380. 380. 380. 380. 380. 380. 380. 380. 380.
 -1.4828.4828.4828.4828.4828.4828.4828.4828.4828.4828.4828.4828.4828.4828.4828.
   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.
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   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.
0530.0380.0380.0380.0380.0380.0380.0380.0380.0380.0380.0380.0380.0380.0380.0740.
0017.0005.0000.0000.0000.0000.0002.0003.0003.0003.0003.0005.0005.0005.0005.0017.
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USNRC COMPUTER CODE-PAVAN, VERSION 2.0 RUN DATE: 07/28/05

PRINTOUT OF INPUT CARDS

```
   1     00010 01111 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000   2     Quad Cities
Elevated Releas
   3     90.2 meters         10.1-90.2 meters
   4
   5     QDC, Elevated Release, EAB and LPZ, Station Chimney, Revision 1 met data          6          7 42727     1
   7          0.500  1564.000    43.700    94.600    90.200
   8       0.000  0.000  0.000  0.000  0.000  0.000  0.000
   9       0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000
   9       4.000  5.000  4.000  8.000  2.000  1.000  3.000  6.000  5.000  9.000 10.000 20.000 18.000 29.000 23.000 12.000
   9      33.000 45.000 30.000 25.000 12.000  9.000 28.000 57.000 28.000 90.000 49.000 47.000 78.000 59.000 72.000 73.000
   9      20.000 23.000 28.000 11.000  5.000 11.000 28.000 62.000 69.000120.000 24.000 32.000 47.000 87.000102.000 60.000
   9       1.000  3.000  4.000  5.000  0.000  5.000  9.000 21.000 29.000 35.000  5.000  3.000 11.000 44.000 37.000  9.000
   9       1.000  0.000  2.000  2.000  0.000  1.000  0.000  4.000  3.000 16.000  0.000  0.000  2.000  6.000  8.000  0.000
   9       0.000  0.000  0.000  0.000  1.000  0.000  1.000  1.000  0.000  0.000  0.000  2.000  1.000  1.000  2.000  0.000
   9      22.000 21.000 22.000 29.000 17.000 20.000 16.000 23.000 18.000 42.000 46.000 37.000 48.000 42.000 31.000 31.000
   9      46.000 53.000 54.000 29.000 24.000 41.000 44.000 69.000 45.000 99.000 57.000 64.000 70.000 65.000 72.000 53.000
   9      15.000 15.000 25.000 11.000 12.000 18.000 29.000 39.000 26.000 64.000 39.000 34.000 72.000 65.000 58.000 57.000
   9       6.000  4.000  2.000 11.000  5.000 12.000  6.000  9.000 11.000 27.000 14.000  3.000 26.000 32.000 25.000  5.000
   9       0.000  1.000  1.000  3.000  0.000  2.000  1.000  3.000  3.000  6.000  4.000  1.000  7.000 11.000  8.000  2.000
   9       0.000  0.000  0.000  0.000  0.000  2.000  1.000  1.000  0.000  4.000  3.000  4.000  4.000  3.000  1.000  1.000
   9      42.000 28.000 34.000 33.000 38.000 28.000 30.000 42.000 30.000 64.000 65.000 40.000 56.000 63.000 65.000 53.000
   9      43.000 54.000 50.000 31.000 37.000 39.000 53.000 69.000 41.000 93.000 49.000 60.000 76.000 69.000 59.000 61.000
   9      23.000 15.000 33.000 26.000 20.000 34.000 33.000 37.000 32.000 50.000 43.000 49.000 78.000 73.000 76.000 40.000
   9       9.000  6.000  5.000 13.000  9.000 12.000  7.000 12.000 12.000 28.000 12.000 12.000 38.000 47.000 29.000  9.000
   9       1.000  1.000  0.000  4.000  2.000  5.000  0.000  0.000  5.000 16.000  3.000  1.000 17.000 22.000  8.000  3.000
   9      36.000 19.000 25.000 30.000 29.000 31.000 29.000 34.000 26.000 29.000 38.000 28.000 41.000 29.000 36.000 24.000
   9     157.000128.000156.000170.000268.000186.000167.000153.000135.000180.000173.000174.000196.000172.000227.000175.000
   9     295.000260.000334.000351.000391.000296.000229.000264.000182.000208.000246.000275.000340.000519.000505.000308.000
   9     337.000258.000353.000384.000330.000225.000251.000204.000236.000274.000244.000291.000578.000914.000678.000329.000
   9      73.000107.000215.000234.000 99.000152.000103.000 98.000116.000164.000131.000112.000338.000485.000325.000109.000
   9      25.000 26.000 71.000 78.000 16.000 62.000 43.000 59.000 71.000 64.000 51.000 48.000233.000307.000113.000 19.000
   9      20.000 14.000  5.000 17.000 23.000 22.000 12.000  5.000 18.000 12.000 15.000 16.000  6.000  5.000 13.000 16.000
   9      77.000 75.000 88.000 88.000149.000 76.000 78.000 78.000 69.000 76.000 81.000 59.000 67.000 70.000 74.000 90.000
   9     187.000159.000169.000182.000255.000211.000198.000219.000205.000264.000201.000168.000208.000204.000236.000247.000
   9     209.000131.000158.000194.000162.000282.000301.000329.000408.000468.000438.000287.000348.000397.000308.000243.000
   9      13.000  8.000 27.000 46.000 20.000 89.000 95.000145.000237.000310.000173.000 49.000 69.000 51.000 25.000 10.000
   9       1.000  0.000  4.000  6.000  4.000 24.000 14.000 61.000 85.000 99.000 24.000  5.000  4.000  3.000  0.000  1.000
   9      14.000 19.000 13.000 17.000 12.000  6.000  7.000  9.000 11.000  9.000  8.000 14.000 13.000 15.000  8.000  8.000
   9      46.000 48.000 52.000 62.000 72.000 57.000 46.000 50.000 46.000 22.000 48.000 33.000 45.000 20.000 41.000 52.000
   9     104.000 75.000 99.000 80.000 95.000113.000122.000205.000166.000179.000104.000 72.000 61.000 60.000 80.000108.000
   9      54.000 38.000 47.000 44.000 40.000154.000234.000243.000255.000259.000 92.000 45.000 63.000 78.000 57.000 50.000
   9       1.000  0.000  3.000  2.000  0.000 26.000 38.000 29.000 28.000 31.000 15.000  2.000  3.000  7.000  2.000  2.000
   9       0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  2.000  0.000  0.000  0.000  0.000  0.000  0.000
   9      10.000 11.000  9.000 14.000 14.000 10.000  7.000 11.000  8.000 11.000  5.000  1.000  9.000  7.000  2.000  8.000
   9      23.000 27.000 26.000 31.000 24.000 33.000 45.000 20.000 39.000 40.000 44.000 26.000 28.000 15.000 12.000 23.000
   9      30.000 23.000 29.000 28.000 24.000 48.000 76.000 99.000 89.000 88.000 64.000 23.000 39.000 27.000 25.000 16.000
   9      15.000 10.000 10.000  0.000  5.000 22.000 74.000115.000 91.000119.000 30.000  8.000  9.000 12.000  9.000 13.000
   9       1.000  0.000  0.000  0.000  1.000  6.000 12.000  6.000  3.000  6.000  1.000  1.000  0.000  1.000  0.000  0.000
   9       0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  10          101.  0.750  3.500
7.500 12.500 18.500 24.000 55.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  11          380.   380.   380.   380.   380.   380.   380.   380.   380.
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380.   380.   380.   380.   380.   380.   380.  11        -1.  4828.  4828.  4828.  4828.  4828.  4828.  4828.  4828.  4828.  4828.  4828.  4828.
4828.  4828.  12         1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0
  12         1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0  13        530.   380.-  380.
380.   380.   380.   380.   380.   380.   380.   380.   380.   380.   380.   380.   740.
  14         17.    5.     0.     0.     0.     0.     2.     3.     3.     3.     3.     5.     5.     5.     5.     17.
```

USNRC COMPUTER CODE-PAVAN, VERSION 2.0 RUN DATE: 07/28/05

PLANT NAME: Quad Cities
DATA PERIOD:
TYPE OF RELEASE: Elevated Releas
SOURCE OF DATA:
COMMENTS: QDC, Elevated Release, EAB and LPZ, Station Chimney, Revision 1 met data
PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145

METEOROLOGICAL INSTRUMENTATION
WIND SENSORS HEIGHT: 90.2 meters
DELTA-T HEIGHTS: 10.1-90.2 meters

RELATIVE CONCENTRATION (X/Q) VALUES (SEC/CUBIC METER)
VERSUS
AVERAGING TIME

DOWNWIND SECTOR	DISTANCE (METERS)	0-2 HOURS	0-8 HOURS	8-24 HOURS	1-4 DAYS	4-30 DAYS	ANNUAL AVERAGE	HOURS PER YEAR MAX 0-2 HR X/Q IS EXCEEDED IN SECTOR	DOWNWIND SECTOR
S	380.	5.17E-06	2.04E-06	1.28E-06	4.69E-07	1.10E-07	1.88E-08	38.0	S
SSW	380.	3.66E-06	1.52E-06	9.79E-07	3.77E-07	9.59E-08	1.80E-08	13.0	SSW
SW	380.	3.33E-06	1.34E-06	8.54E-07	3.19E-07	7.75E-08	1.37E-08	8.4	SW
WSW	380.	3.35E-06	1.31E-06	8.24E-07	2.99E-07	6.98E-08	1.18E-08	11.4	WSW
W	380.	3.31E-06	1.16E-06	6.84E-07	2.19E-07	4.25E-08	5.74E-09	8.9	W
WNW	380.	3.18E-06	1.16E-06	6.96E-07	2.32E-07	4.77E-08	6.91E-09	9.5	WNW
NW	380.	3.44E-06	1.38E-06	8.76E-07	3.26E-07	7.86E-08	1.38E-08	10.8	NW
NNW	380.	4.08E-06	1.78E-06	1.18E-06	4.81E-07	1.33E-07	2.74E-08	15.7	NNW
N	380.	3.50E-06	1.51E-06	9.90E-07	3.96E-07	1.07E-07	2.14E-08	11.5	N
NNE	380.	4.71E-06	2.19E-06	1.50E-06	6.53E-07	1.98E-07	4.62E-08	21.7	NNE
NE	380.	4.56E-06	1.90E-06	1.22E-06	4.73E-07	1.21E-07	2.27E-08	22.8	NE
ENE	380.	4.35E-06	1.88E-06	1.24E-06	4.99E-07	1.35E-07	2.74E-08	23.7	ENE
E	380.	4.94E-06	2.21E-06	1.48E-06	6.16E-07	1.76E-07	3.79E-08	30.4	E
ESE	380.	4.82E-06	2.23E-06	1.51E-06	6.54E-07	1.96E-07	4.50E-08	28.2	ESE
SE	380.	4.83E-06	2.24E-06	1.52E-06	6.60E-07	1.99E-07	4.58E-08	26.5	SE
SSE	380.	5.48E-06	2.39E-06	1.58E-06	6.40E-07	1.76E-07	3.61E-08	43.7	SSE
MAX X/Q		5.48E-06				TOTAL HOURS AROUND SITE:		324.3	
SRP 2.3.4	380.	6.38E-06	2.82E-06	1.88E-06	7.77E-07	2.18E-07	4.62E-08		
SITE LIMIT		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.62E-08		

0.5 PERCENT X/Q TO AN INDIVIDUAL IS LIMITING.

X/Q VALUES (SEC/CUBIC METER) FOR FUMIGATION AT THE BOUNDARY:

DOWNWIND SECTOR	DISTANCE (METERS)	FUMIGATION X/Q
S	380.	1.57E-04
SSW	380.	1.44E-04
SW	380.	1.37E-04
WSW	380.	1.37E-04
W	380.	1.37E-04
WNW	380.	1.37E-04
NW	380.	1.40E-04
NNW	380.	1.41E-04
N	380.	1.41E-04
NNE	380.	1.41E-04
NE	380.	1.41E-04
ENE	380.	1.44E-04
E	380.	1.44E-04
ESE	380.	1.44E-04
SE	380.	1.44E-04
SSE	380.	1.51E-04

NOTE: VALUES ON THIS PAGE ARE APPROXIMATIONS ONLY.
CHECK THE REASONABLENESS OF THE ENVELOPES
COMPUTED FOR THE 0-2 HOUR VALUES. FOR ANY
FAULTY ENVELOPES, ADJUST THE ABOVE VALUES.

Station Chimney to Control Room Intake (127 m)

```
  1 . 1111
Quad Cities                                   Elevated Release
90.2 meters          10.1-90.2 meters

QDC, Elevated Release, Control Room Intake, Station Chimney, Rev 1 met data
    7    0
1564. 43.7 85.8 90.2
   0    0    0    0    0    0    0
   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.
   4.   5.   4.   8.   2.   1.   3.   6.   5.   9.  10.  20.  18.  29.  23.  12.
  33.  45.  30.  25.  12.   9.  28.  57.  28.  90.  49.  47.  78.  59.  72.  73.
  20.  23.  28.  11.   5.  11.  28.  62.  69. 120.  24.  32.  47.  87. 102.  60.
   1.   3.   4.   5.   0.   5.   9.  21.  29.  35.   5.   3.  11.  44.  37.   9.
   1.   0.   2.   2.   0.   1.   0.   4.   3.  16.   0.   0.   2.   6.   8.   0.
   0.   0.   0.   0.   1.   0.   1.   1.   0.   0.   0.   2.   1.   1.   2.   0.
  22.  21.  22.  29.  17.  20.  16.  23.  18.  42.  46.  37.  48.  42.  31.  31.
  46.  53.  54.  29.  24.  41.  44.  69.  45.  99.  57.  64.  70.  65.  72.  53.
  15.  15.  25.  11.  12.  18.  29.  39.  26.  64.  39.  34.  72.  65.  58.  57.
   6.   4.   2.  11.   5.  12.   6.   9.  11.  27.  14.   3.  26.  32.  25.   5.
   0.   1.   1.   3.   0.   2.   1.   3.   3.   6.   4.   1.   7.  11.   8.   2.
   0.   0.   0.   0.   0.   2.   1.   1.   0.   4.   3.   4.   4.   3.   1.   1.
  42.  28.  34.  33.  38.  28.  30.  42.  30.  64.  65.  40.  56.  63.  65.  53.
  43.  54.  50.  31.  37.  39.  53.  69.  41.  93.  49.  60.  76.  69.  59.  61.
  23.  15.  33.  26.  20.  34.  33.  37.  32.  50.  43.  49.  78.  73.  76.  40.
   9.   6.   5.  13.   9.  12.   7.  12.  12.  28.  12.  12.  38.  47.  29.   9.
   1.   1.   0.   4.   2.   5.   0.   0.   5.  16.   3.   1.  17.  22.   8.   3.
  36.  19.  25.  30.  29.  31.  29.  34.  26.  29.  38.  28.  41.  29.  36.  24.
 157. 128. 156. 170. 268. 186. 167. 153. 135. 180. 173. 174. 196. 172. 227. 175.
 295. 260. 334. 351. 391. 296. 229. 264. 182. 208. 246. 275. 340. 519. 505. 308.
 337. 258. 353. 384. 330. 225. 251. 204. 236. 274. 244. 291. 578. 914. 678. 329.
  73. 107. 215. 234.  99. 152. 103.  98. 116. 164. 131. 112. 338. 485. 325. 109.
  25.  26.  71.  78.  16.  62.  43.  59.  71.  64.  51.  48. 233. 307. 113.  19.
  20.  14.   5.  17.  23.  22.  12.   5.  18.  12.  15.  16.   6.   5.  13.  16.
  77.  75.  88.  88. 149.  76.  78.  78.  69.  76.  81.  59.  67.  70.  74.  90.
 187. 159. 169. 182. 255. 211. 198. 219. 205. 264. 201. 168. 208. 204. 236. 247.
 209. 131. 158. 194. 162. 282. 301. 329. 408. 468. 438. 287. 348. 397. 308. 243.
  13.   8.  27.  46.  20.  89.  95. 145. 237. 310. 173.  49.  69.  51.  25.  10.
   1.   0.   4.   6.   4.  24.  14.  61.  85.  99.  24.   5.   4.   3.   0.   1.
  14.  19.  13.  17.  12.   6.   7.   9.  11.   9.   8.  14.  13.  15.   8.   8.
  46.  48.  52.  62.  72.  57.  46.  50.  46.  22.  48.  33.  45.  20.  41.  52.
 104.  75.  99.  80.  95. 113. 122. 205. 166. 179. 104.  72.  61.  60.  80. 108.
  54.  38.  47.  44.  40. 154. 234. 243. 255. 259.  92.  45.  63.  78.  57.  50.
   1.   0.   3.   2.   0.  26.  38.  29.  28.  31.  15.   2.   3.   7.   2.   2.
   0.   0.   0.   0.   0.   0.   0.   0.   0.   2.   0.   0.   0.   0.   0.   0.
  10.  11.   9.  14.  14.  10.   7.  11.   8.  11.   5.   1.   9.   7.   2.   8.
  23.  27.  26.  31.  24.  33.  45.  20.  39.  40.  44.  26.  28.  15.  12.  23.
  30.  23.  29.  28.  24.  48.  76.  99.  89.  88.  64.  23.  39.  27.  25.  16.
  15.  10.  10.   0.   5.  22.  74. 115.  91. 119.  30.   8.   9.  12.   9.  13.
   1.   0.   0.   0.   1.   6.  12.   6.   3.   6.   1.   1.   0.   1.   0.   0.
   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.
 101. 0.75 3.50 7.50 12.5 18.5 24.0 55.0
 127. 127. 127. 127. 127. 127. 127. 127. 127. 127. 127. 127. 127. 127. 127. 127.
  -1.4828.4828.4828.4828.4828.4828.4828.4828.4828.4828.4828.4828.4828.4828.4828.
   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.
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   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.
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USNRC COMPUTER CODE-PAVAN, VERSION 2.0          RUN DATE: 09/13/04


PRINTOUT OF INPUT CARDS

   1     00010 01111 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000   2     Quad Cities
Elevated Release
   3     90.2 meters          10.1-90.2 meters
   4
   5     QDC, Elevated Release, Control Room Intake, Station Chimney, Rev 1 met data        6          7 42727     0
   7          0.500  1564.000    43.700    85.800    90.200
   8       0.000  0.000  0.000  0.000  0.000  0.000  0.000
   9       0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000
   9       4.000  5.000  4.000  8.000  2.000  1.000  3.000  6.000  5.000  9.000 10.000 20.000 18.000 29.000 23.000 12.000
   9      33.000 45.000 30.000 25.000 12.000  9.000 28.000 57.000 28.000 90.000 49.000 47.000 78.000 59.000 72.000 73.000
   9      20.000 23.000 28.000 11.000  5.000 11.000 28.000 62.000 69.000120.000 24.000 32.000 47.000 87.000102.000 60.000
   9       1.000  3.000  4.000  5.000  0.000  5.000  9.000 21.000 29.000 35.000  5.000  3.000 11.000 44.000 37.000  9.000
   9       1.000  0.000  2.000  2.000  0.000  1.000  0.000  4.000  3.000 16.000  0.000  0.000  2.000  6.000  8.000  0.000
   9       0.000  0.000  0.000  0.000  1.000  0.000  1.000  1.000  0.000  0.000  0.000  2.000  1.000  1.000  2.000  0.000
   9      22.000 21.000 22.000 29.000 17.000 20.000 16.000 23.000 18.000 42.000 46.000 37.000 48.000 42.000 31.000 31.000
   9      46.000 53.000 54.000 29.000 24.000 41.000 44.000 69.000 45.000 99.000 57.000 64.000 70.000 65.000 72.000 53.000
   9      15.000 15.000 25.000 11.000 12.000 18.000 29.000 39.000 26.000 64.000 39.000 34.000 72.000 65.000 58.000 57.000
   9       6.000  4.000  2.000 11.000  5.000 12.000  6.000  9.000 11.000 27.000 14.000  3.000 26.000 32.000 25.000  5.000
   9       0.000  1.000  1.000  3.000  0.000  2.000  1.000  3.000  3.000  6.000  4.000  1.000  7.000 11.000  8.000  2.000
   9       0.000  0.000  0.000  0.000  0.000  2.000  1.000  1.000  0.000  4.000  3.000  4.000  4.000  3.000  1.000  1.000
   9      42.000 28.000 34.000 33.000 38.000 28.000 30.000 42.000 30.000 64.000 65.000 40.000 56.000 63.000 65.000 53.000
   9      43.000 54.000 50.000 31.000 37.000 39.000 53.000 69.000 41.000 93.000 49.000 60.000 76.000 69.000 59.000 61.000
   9      23.000 15.000 33.000 26.000 20.000 34.000 33.000 37.000 32.000 50.000 43.000 49.000 78.000 73.000 76.000 40.000
   9       9.000  6.000  5.000 13.000  9.000 12.000  7.000 12.000 12.000 28.000 12.000 12.000 38.000 47.000 29.000  9.000
   9       1.000  1.000  0.000  4.000  2.000  5.000  0.000  0.000  5.000 16.000  3.000  1.000 17.000 22.000  8.000  3.000
   9      36.000 19.000 25.000 30.000 29.000 31.000 29.000 34.000 26.000 29.000 38.000 28.000 41.000 29.000 36.000 24.000
   9     157.000128.000156.000170.000268.000186.000167.000153.000135.000180.000173.000174.000196.000172.000227.000175.000
   9     295.000260.000334.000351.000391.000296.000229.000264.000182.000208.000246.000275.000340.000519.000505.000308.000
   9     337.000258.000353.000384.000330.000225.000251.000204.000236.000274.000244.000291.000578.000914.000678.000329.000
   9      73.000107.000215.000234.000 99.000152.000103.000 98.000116.000164.000131.000112.000338.000485.000325.000109.000
   9      25.000 26.000 71.000 78.000 16.000 62.000 43.000 59.000 71.000 64.000 51.000 48.000233.000307.000113.000 19.000
   9      20.000 14.000  5.000 17.000 23.000 22.000 12.000  5.000 18.000 12.000 15.000 16.000  6.000  5.000 13.000 16.000
   9      77.000 75.000 88.000 88.000149.000 76.000 78.000 78.000 69.000 76.000 81.000 59.000 67.000 70.000 74.000 90.000
   9     187.000159.000169.000182.000255.000211.000198.000219.000205.000264.000201.000168.000208.000204.000236.000247.000
   9     209.000131.000158.000194.000162.000282.000301.000329.000408.000468.000438.000287.000348.000397.000308.000243.000
   9      13.000  8.000 27.000 46.000 20.000 89.000 95.000145.000237.000310.000173.000 49.000 69.000 51.000 25.000 10.000
   9       1.000  0.000  4.000  6.000  4.000 24.000 14.000 61.000 85.000 99.000 24.000  5.000  4.000  3.000  0.000  1.000
   9      14.000 19.000 13.000 17.000 12.000  6.000  7.000  9.000 11.000  9.000  8.000 14.000 13.000 15.000  8.000  8.000
   9      46.000 48.000 52.000 62.000 72.000 57.000 46.000 50.000 46.000 22.000 48.000 33.000 45.000 20.000 41.000 52.000
   9     104.000 75.000 99.000 80.000 95.000113.000122.000205.000166.000179.000104.000 72.000 61.000 60.000 80.000108.000
   9      54.000 38.000 47.000 44.000 40.000154.000234.000243.000255.000259.000 92.000 45.000 63.000 78.000 57.000 50.000
   9       1.000  0.000  3.000  2.000  0.000 26.000 38.000 29.000 28.000 31.000 15.000  2.000  3.000  7.000  2.000  2.000
   9       0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  2.000  0.000  0.000  0.000  0.000  0.000  0.000
   9      10.000 11.000  9.000 14.000 14.000 10.000  7.000 11.000  8.000 11.000  5.000  1.000  9.000  7.000  2.000  8.000
   9      23.000 27.000 26.000 31.000 24.000 33.000 45.000 20.000 39.000 40.000 44.000 26.000 28.000 15.000 12.000 23.000
   9      30.000 23.000 29.000 28.000 24.000 48.000 76.000 99.000 89.000 88.000 64.000 23.000 39.000 27.000 25.000 16.000
   9      15.000 10.000 10.000  0.000  5.000 22.000 74.000115.000 91.000119.000 30.000  8.000  9.000 12.000  9.000 13.000
   9       1.000  0.000  0.000  0.000  1.000  6.000 12.000  6.000  3.000  6.000  1.000  1.000  0.000  1.000  0.000  0.000
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  9       0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  10        101.  0.750  3.500
7.500 12.500 18.500 24.000 55.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  11        127.   127.   127.   127.   127.   127.   127.   127.   127.
127.   127.   127.   127.   127.   127.   127.  11        -1.  4828.  4828.  4828.  4828.  4828.  4828.  4828.  4828.  4828.  4828.  4828.  4828.  4828.
4828.  4828.  12         1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0
  12       1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0
```

USNRC COMPUTER CODE-PAVAN, VERSION 2.0 RUN DATE: 09/13/04

PLANT NAME: Quad Cities
DATA PERIOD:
TYPE OF RELEASE: Elevated Release
SOURCE OF DATA:
COMMENTS: QDC, Elevated Release, Control Room Intake, Station Chimney, Rev 1 met data
PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145

METEOROLOGICAL INSTRUMENTATION
WIND SENSORS HEIGHT: 90.2 meters
DELTA-T HEIGHTS: 10.1-90.2 meters

RELATIVE CONCENTRATION (X/Q) VALUES (SEC/CUBIC METER)
VERSUS
AVERAGING TIME

DOWNWIND SECTOR	DISTANCE (METERS)	0-2 HOURS	0-8 HOURS	8-24 HOURS	1-4 DAYS	4-30 DAYS	ANNUAL AVERAGE	HOURS PER YEAR MAX 0-2 HR X/Q IS EXCEEDED IN SECTOR	DOWNWIND SECTOR
S	127.	4.36E-06	3.57E-07	1.02E-07	6.74E-09	1.36E-10	1.15E-12	26.6	S
SSW	127.	4.12E-06	3.55E-07	1.04E-07	7.31E-09	1.61E-10	1.51E-12	21.7	SSW
SW	127.	4.12E-06	3.44E-07	9.94E-08	6.72E-09	1.40E-10	1.24E-12	21.6	SW
WSW	127.	4.18E-06	3.40E-07	9.68E-08	6.35E-09	1.27E-10	1.06E-12	25.1	WSW
W	127.	4.30E-06	3.05E-07	8.13E-08	4.61E-09	7.49E-11	4.85E-13	23.1	W
WNW	127.	4.27E-06	3.19E-07	8.71E-08	5.22E-09	9.19E-11	6.55E-13	24.3	WNW
NW	127.	4.46E-06	4.22E-07	1.30E-07	1.00E-08	2.55E-10	2.85E-12	26.5	NW
NNW	127.	4.94E-06	5.42E-07	1.80E-07	1.64E-08	5.24E-10	7.79E-12	35.6	NNW
N	127.	4.13E-06	3.77E-07	1.14E-07	8.47E-09	2.03E-10	2.12E-12	21.4	N
NNE	127.	5.21E-06	5.16E-07	1.62E-07	1.32E-08	3.59E-10	4.38E-12	41.1	NNE
NE	127.	5.08E-06	4.37E-07	1.28E-07	8.94E-09	1.96E-10	1.82E-12	39.0	NE
ENE	127.	4.79E-06	4.31E-07	1.29E-07	9.48E-09	2.22E-10	2.26E-12	34.2	ENE
E	127.	5.31E-06	4.96E-07	1.52E-07	1.16E-08	2.88E-10	3.14E-12	43.7	E
ESE	127.	5.13E-06	5.03E-07	1.58E-07	1.27E-08	3.40E-10	4.07E-12	40.2	ESE
SE	127.	5.20E-06	5.12E-07	1.61E-07	1.30E-08	3.53E-10	4.26E-12	41.0	SE
SSE	127.	4.94E-06	4.62E-07	1.41E-07	1.08E-08	2.70E-10	2.95E-12	34.3	SSE
MAX X/Q		5.31E-06				TOTAL HOURS AROUND SITE:		499.3	
SRP 2.3.4	127.	5.77E-06	6.17E-07	2.02E-07	1.79E-08	5.51E-10	7.79E-12		
SITE LIMIT		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.79E-12		

THE FIVE-PERCENT-FOR-THE-ENTIRE-SITE X/Q IS LIMITING.

X/Q VALUES (SEC/CUBIC METER) FOR FUMIGATION AT THE BOUNDARY:

DOWNWIND SECTOR	DISTANCE (METERS)	FUMIGATION X/Q
S	127.	4.05E-04
SSW	127.	4.05E-04
SW	127.	4.05E-04
WSW	127.	4.05E-04
W	127.	4.08E-04
WNW	127.	4.12E-04
NW	127.	4.21E-04
NNW	127.	4.25E-04
N	127.	4.06E-04
NNE	127.	4.05E-04
NE	127.	4.05E-04
ENE	127.	4.05E-04
E	127.	4.05E-04
ESE	127.	4.05E-04
SE	127.	4.05E-04
SSE	127.	4.05E-04

NOTE: VALUES ON THIS PAGE ARE APPROXIMATIONS ONLY.
CHECK THE REASONABLENESS OF THE ENVELOPES
COMPUTED FOR THE 0-2 HOUR VALUES. FOR ANY
FAULTY ENVELOPES, ADJUST THE ABOVE VALUES.

Station Chimney to Control Room Intake (75 and 100m)

```
   1  1111
Quad Cities                                   Elevated Release
90.2 meters          10.1-90.2 meters

QDC, Elevated Release, Control Room Intake, Station Chimney, Rev 1 met data
    7    0
1564. 43.7 85.8 90.2
    0    0    0    0    0    0    0
   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.
   4.   5.   4.   8.   2.   1.   3.   6.   5.   9.  10.  20.  18.  29.  23.  12.
  33.  45.  30.  25.  12.   9.  28.  57.  28.  90.  49.  47.  78.  59.  72.  73.
  20.  23.  28.  11.   5.  11.  28.  62.  69. 120.  24.  32.  47.  87. 102.  60.
   1.   3.   4.   5.   0.   5.   9.  21.  29.  35.   5.   3.  11.  44.  37.   9.
   1.   0.   2.   2.   0.   1.   0.   4.   3.  16.   0.   0.   2.   6.   8.   0.
   0.   0.   0.   0.   1.   0.   1.   1.   0.   0.   0.   2.   1.   1.   2.   0.
  22.  21.  22.  29.  17.  20.  16.  23.  18.  42.  46.  37.  48.  42.  31.  31.
  46.  53.  54.  29.  24.  41.  44.  69.  45.  99.  57.  64.  70.  65.  72.  53.
  15.  15.  25.  11.  12.  18.  29.  39.  26.  64.  39.  34.  72.  65.  58.  57.
   6.   4.   2.  11.   5.  12.   6.   9.  11.  27.  14.   3.  26.  32.  25.   5.
   0.   1.   1.   3.   0.   2.   1.   3.   3.   6.   4.   1.   7.  11.   8.   2.
   0.   0.   0.   0.   0.   2.   1.   1.   0.   4.   3.   4.   4.   3.   1.   1.
  42.  28.  34.  33.  38.  28.  30.  42.  30.  64.  65.  40.  56.  63.  65.  53.
  43.  54.  50.  31.  37.  39.  53.  69.  41.  93.  49.  60.  76.  69.  59.  61.
  23.  15.  33.  26.  20.  34.  33.  37.  32.  50.  43.  49.  78.  73.  76.  40.
   9.   6.   5.  13.   9.  12.   7.  12.  12.  28.  12.  12.  38.  47.  29.   9.
   1.   1.   0.   4.   2.   5.   0.   0.   5.  16.   3.   1.  17.  22.   8.   3.
  36.  19.  25.  30.  29.  31.  29.  34.  26.  29.  38.  28.  41.  29.  36.  24.
 157. 128. 156. 170. 268. 186. 167. 153. 135. 180. 173. 174. 196. 172. 227. 175.
 295. 260. 334. 351. 391. 296. 229. 264. 182. 208. 246. 275. 340. 519. 505. 308.
 337. 258. 353. 384. 330. 225. 251. 204. 236. 274. 244. 291. 578. 914. 678. 329.
  73. 107. 215. 234.  99. 152. 103.  98. 116. 164. 131. 112. 338. 485. 325. 109.
  25.  26.  71.  78.  16.  62.  43.  59.  71.  64.  51.  48. 233. 307. 113.  19.
  20.  14.   5.  17.  23.  22.  12.   5.  18.  12.  15.  16.   6.   5.  13.  16.
  77.  75.  88.  88. 149.  76.  78.  78.  69.  76.  81.  59.  67.  70.  74.  90.
 187. 159. 169. 182. 255. 211. 198. 219. 205. 264. 201. 168. 208. 204. 236. 247.
 209. 131. 158. 194. 162. 282. 301. 329. 408. 468. 438. 287. 348. 397. 308. 243.
  13.   8.  27.  46.  20.  89.  95. 145. 237. 310. 173.  49.  69.  51.  25.  10.
   1.   0.   4.   6.   4.  24.  14.  61.  85.  99.  24.   5.   4.   3.   0.   1.
  14.  19.  13.  17.  12.   6.   7.   9.  11.   9.   8.  14.  13.  15.   8.   8.
  46.  48.  52.  62.  72.  57.  46.  50.  46.  22.  48.  33.  45.  20.  41.  52.
 104.  75.  99.  80.  95. 113. 122. 205. 166. 179. 104.  72.  61.  60.  80. 108.
  54.  38.  47.  44.  40. 154. 234. 243. 255. 259.  92.  45.  63.  78.  57.  50.
   1.   0.   3.   2.   0.  26.  38.  29.  28.  31.  15.   2.   3.   7.   2.   2.
   0.   0.   0.   0.   0.   0.   0.   0.   0.   2.   0.   0.   0.   0.   0.   0.
  10.  11.   9.  14.  14.  10.   7.  11.   8.  11.   5.   1.   9.   7.   2.   8.
  23.  27.  26.  31.  24.  33.  45.  20.  39.  40.  44.  26.  28.  15.  12.  23.
  30.  23.  29.  28.  24.  48.  76.  99.  89.  88.  64.  23.  39.  27.  25.  16.
  15.  10.  10.   0.   5.  22.  74. 115.  91. 119.  30.   8.   9.  12.   9.  13.
   1.   0.   0.   0.   1.   6.  12.   6.   3.   6.   1.   1.   0.   1.   0.   0.
   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.
 101. 0.75 3.50 7.50 12.5 18.5 24.0 55.0
  75.  75.  75.  75.  75.  75.  75.  75.  75.  75.  75.  75.  75.  75.  75.  75.
 100. 100. 100. 100. 100. 100. 100. 100. 100. 100. 100. 100. 100. 100. 100. 100.
   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.
   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.
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USNRC COMPUTER CODE-PAVAN, VERSION 2.0 RUN DATE: 09/13/04

PRINTOUT OF INPUT CARDS

```
   1     00010 01111 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000   2     Quad Cities
Elevated Release
   3     90.2 meters         10.1-90.2 meters
   4
   5     QDC, Elevated Release, Control Room Intake, Station Chimney, Rev 1 met data        6          7 42727     0
   7          0.500  1564.000    43.700    85.800    90.200
   8       0.000  0.000  0.000  0.000  0.000  0.000  0.000
   9       0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000
   9       4.000  5.000  4.000  8.000  2.000  1.000  3.000  6.000  5.000  9.000 10.000 20.000 18.000 29.000 23.000 12.000
   9      33.000 45.000 30.000 25.000 12.000  9.000 28.000 57.000 28.000 90.000 49.000 47.000 78.000 59.000 72.000 73.000
   9      20.000 23.000 28.000 11.000  5.000 11.000 28.000 62.000 69.000120.000 24.000 32.000 47.000 87.000102.000 60.000
   9       1.000  3.000  4.000  5.000  0.000  5.000  9.000 21.000 29.000 35.000  5.000  3.000 11.000 44.000 37.000  9.000
   9       1.000  0.000  2.000  2.000  0.000  1.000  0.000  4.000  3.000 16.000  0.000  0.000  2.000  6.000  8.000  0.000
   9       0.000  0.000  0.000  0.000  1.000  0.000  1.000  1.000  0.000  0.000  0.000  2.000  1.000  1.000  2.000  0.000
   9      22.000 21.000 22.000 29.000 17.000 20.000 16.000 23.000 18.000 42.000 46.000 37.000 48.000 42.000 31.000 31.000
   9      46.000 53.000 54.000 29.000 24.000 41.000 44.000 69.000 45.000 99.000 57.000 64.000 70.000 65.000 72.000 53.000
   9      15.000 15.000 25.000 11.000 12.000 18.000 29.000 39.000 26.000 64.000 39.000 34.000 72.000 65.000 58.000 57.000
   9       6.000  4.000  2.000 11.000  5.000 12.000  6.000  9.000 11.000 27.000 14.000  3.000 26.000 32.000 25.000  5.000
   9       0.000  1.000  1.000  3.000  0.000  2.000  1.000  3.000  3.000  6.000  4.000  1.000  7.000 11.000  8.000  2.000
   9       0.000  0.000  0.000  0.000  0.000  2.000  1.000  1.000  0.000  4.000  3.000  4.000  4.000  3.000  1.000  1.000
   9      42.000 28.000 34.000 33.000 38.000 28.000 30.000 42.000 30.000 64.000 65.000 40.000 56.000 63.000 65.000 53.000
   9      43.000 54.000 50.000 31.000 37.000 39.000 53.000 69.000 41.000 93.000 49.000 60.000 76.000 69.000 59.000 61.000
   9      23.000 15.000 33.000 26.000 20.000 34.000 33.000 37.000 32.000 50.000 43.000 49.000 78.000 73.000 76.000 40.000
   9       9.000  6.000  5.000 13.000  9.000 12.000  7.000 12.000 12.000 28.000 12.000 12.000 38.000 47.000 29.000  9.000
   9       1.000  1.000  0.000  4.000  2.000  5.000  0.000  0.000  5.000 16.000  3.000  1.000 17.000 22.000  8.000  3.000
   9      36.000 19.000 25.000 30.000 29.000 31.000 29.000 34.000 26.000 29.000 38.000 28.000 41.000 29.000 36.000 24.000
   9     157.000128.000156.000170.000268.000186.000167.000153.000135.000180.000173.000174.000196.000172.000227.000175.000
   9     295.000260.000334.000351.000391.000296.000229.000264.000182.000208.000246.000275.000340.000519.000505.000308.000
   9     337.000258.000353.000384.000330.000225.000251.000204.000236.000274.000244.000291.000578.000914.000678.000329.000
   9      73.000107.000215.000234.000 99.000152.000103.000 98.000116.000164.000131.000112.000338.000485.000325.000109.000
   9      25.000 26.000 71.000 78.000 16.000 62.000 43.000 59.000 71.000 64.000 51.000 48.000233.000307.000113.000 19.000
   9      20.000 14.000  5.000 17.000 23.000 22.000 12.000  5.000 18.000 12.000 15.000 16.000  6.000  5.000 13.000 16.000
   9      77.000 75.000 88.000 88.000149.000 76.000 78.000 78.000 69.000 76.000 81.000 59.000 67.000 70.000 74.000 90.000
   9     187.000159.000169.000182.000255.000211.000198.000219.000205.000264.000201.000168.000208.000204.000236.000247.000
   9     209.000131.000158.000194.000162.000282.000301.000329.000408.000468.000438.000287.000348.000397.000308.000243.000
   9      13.000  8.000 27.000 46.000 20.000 89.000 95.000145.000237.000310.000173.000 49.000 69.000 51.000 25.000 10.000
   9       1.000  0.000  4.000  6.000  4.000 24.000 14.000 61.000 85.000 99.000 24.000  5.000  4.000  3.000  0.000  1.000
   9      14.000 19.000 13.000 17.000 12.000  6.000  7.000  9.000 11.000  9.000  8.000 14.000 13.000 15.000  8.000  8.000
   9      46.000 48.000 52.000 62.000 72.000 57.000 46.000 50.000 46.000 22.000 48.000 33.000 45.000 20.000 41.000 52.000
   9     104.000 75.000 99.000 80.000 95.000113.000122.000205.000166.000179.000104.000 72.000 61.000 60.000 80.000108.000
   9      54.000 38.000 47.000 44.000 40.000154.000234.000243.000255.000259.000 92.000 45.000 63.000 78.000 57.000 50.000
   9       1.000  0.000  3.000  2.000  0.000 26.000 38.000 29.000 28.000 31.000 15.000  2.000  3.000  7.000  2.000  2.000
   9       0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  2.000  0.000  0.000  0.000  0.000  0.000  0.000
   9      10.000 11.000  9.000 14.000 14.000 10.000  7.000 11.000  8.000 11.000  5.000  1.000  9.000  7.000  2.000  8.000
   9      23.000 27.000 26.000 31.000 24.000 33.000 45.000 20.000 39.000 40.000 44.000 26.000 28.000 15.000 12.000 23.000
   9      30.000 23.000 29.000 28.000 24.000 48.000 76.000 99.000 89.000 88.000 64.000 23.000 39.000 27.000 25.000 16.000
   9      15.000 10.000 10.000  0.000  5.000 22.000 74.000115.000 91.000119.000 30.000  8.000  9.000 12.000  9.000 13.000
   9       1.000  0.000  0.000  0.000  1.000  6.000 12.000  6.000  3.000  6.000  1.000  1.000  0.000  1.000  0.000  0.000
   9       0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  10        101.  0.750  3.500
7.500 12.500 18.500 24.000 55.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  11         75.    75.    75.    75.    75.    75.    75.    75.    75.
75.    75.    75.    75.    75.    75.    75.  11        100.   100.   100.   100.   100.   100.   100.   100.   100.   100.   100.   100.   100.   100.
100.   100.  12         1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0
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12	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0

USNRC COMPUTER CODE-PAVAN, VERSION 2.0 RUN DATE: 09/13/04

PLANT NAME: Quad Cities
DATA PERIOD:
TYPE OF RELEASE: Elevated Release
SOURCE OF DATA:
COMMENTS: QDC, Elevated Release, Control Room Intake, Station Chimney, Rev 1 met data
PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145

METEOROLOGICAL INSTRUMENTATION
WIND SENSORS HEIGHT: 90.2 meters
DELTA-T HEIGHTS: 10.1-90.2 meters

RELATIVE CONCENTRATION (X/Q) VALUES (SEC/CUBIC METER)
VERSUS
AVERAGING TIME

DOWNWIND SECTOR	DISTANCE (METERS)	0-2 HOURS	0-8 HOURS	8-24 HOURS	1-4 DAYS	4-30 DAYS	ANNUAL AVERAGE	HOURS PER YEAR MAX 0-2 HR X/Q IS EXCEEDED IN SECTOR	DOWNWIND SECTOR
S	75.	4.36E-06	1.97E-08	1.32E-09	3.78E-12	8.38E-16	2.84E-20	26.6	S
SSW	75.	4.12E-06	1.96E-08	1.35E-09	4.09E-12	9.88E-16	3.71E-20	21.7	SSW
SW	75.	4.12E-06	1.90E-08	1.29E-09	3.76E-12	8.63E-16	3.04E-20	21.6	SW
WSW	75.	4.18E-06	1.88E-08	1.26E-09	3.55E-12	7.80E-16	2.61E-20	25.1	WSW
W	75.	4.30E-06	1.76E-08	1.13E-09	2.90E-12	5.54E-16	1.56E-20	23.1	W
WNW	75.	4.27E-06	1.94E-08	1.31E-09	3.77E-12	8.48E-16	2.92E-20	24.3	WNW
NW	75.	4.46E-06	2.89E-08	2.32E-09	9.81E-12	3.82E-15	2.58E-19	26.5	NW
NNW	75.	4.94E-06	3.95E-08	3.53E-09	1.88E-11	1.02E-14	1.02E-18	35.6	NNW
N	75.	4.13E-06	2.10E-08	1.49E-09	4.84E-12	1.29E-15	5.45E-20	21.4	N
NNE	75.	5.21E-06	2.85E-08	2.11E-09	7.39E-12	2.21E-15	1.08E-19	41.1	NNE
NE	75.	5.08E-06	2.41E-08	1.66E-09	5.01E-12	1.20E-15	4.48E-20	39.0	NE
ENE	75.	4.79E-06	2.38E-08	1.68E-09	5.31E-12	1.37E-15	5.55E-20	34.2	ENE
E	75.	5.31E-06	2.74E-08	1.97E-09	6.48E-12	1.77E-15	7.73E-20	43.7	E
ESE	75.	5.13E-06	2.78E-08	2.04E-09	7.10E-12	2.09E-15	1.00E-19	40.2	ESE
SE	75.	5.20E-06	2.83E-08	2.09E-09	7.29E-12	2.17E-15	1.05E-19	41.0	SE
SSE	75.	4.94E-06	2.55E-08	1.83E-09	6.05E-12	1.66E-15	7.26E-20	34.3	SSE
MAX X/Q		5.31E-06				TOTAL HOURS AROUND SITE:		499.3	
SRP 2.3.4	75.	5.77E-06	4.50E-08	3.97E-09	2.05E-11	1.07E-14	1.02E-18		
SITE LIMIT	,	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.02E-18		

THE FIVE-PERCENT-FOR-THE-ENTIRE-SITE X/Q IS LIMITING.

X/Q VALUES (SEC/CUBIC METER) FOR FUMIGATION AT THE BOUNDARY:

DOWNWIND SECTOR	DISTANCE (METERS)	FUMIGATION X/Q
S	75.	6.52E-04
SSW	75.	6.52E-04
SW	75.	6.52E-04
WSW	75.	6.52E-04
W	75.	6.57E-04
WNW	75.	6.63E-04
NW	75.	6.77E-04
NNW	75.	6.84E-04
N	75.	6.53E-04
NNE	75.	6.52E-04
NE	75.	6.52E-04
ENE	75.	6.52E-04
E	75.	6.52E-04
ESE	75.	6.52E-04
SE	75.	6.52E-04
SSE	75.	6.52E-04

NOTE: VALUES ON THIS PAGE ARE APPROXIMATIONS ONLY.
CHECK THE REASONABLENESS OF THE ENVELOPES
COMPUTED FOR THE 0-2 HOUR VALUES. FOR ANY
FAULTY ENVELOPES, ADJUST THE ABOVE VALUES.

USNRC COMPUTER CODE-PAVAN, VERSION 2.0 RUN DATE: 09/13/04

PLANT NAME: Quad Cities METEOROLOGICAL INSTRUMENTATION
DATA PERIOD: WIND SENSORS HEIGHT: 90.2 meters
TYPE OF RELEASE: Elevated Release DELTA-T HEIGHTS: 10.1-90.2 meters
SOURCE OF DATA:
COMMENTS: QDC, Elevated Release, Control Room Intake, Station Chimney, Rev 1 met data
PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145

RELATIVE CONCENTRATION (X/Q) VALUES (SEC/CUBIC METER)
VERSUS
AVERAGING TIME

DOWNWIND SECTOR	DISTANCE (METERS)	0-2 HOURS	0-8 HOURS	8-24 HOURS	1-4 DAYS	4-30 DAYS	ANNUAL AVERAGE	HOURS PER YEAR MAX 0-2 HR X/Q IS EXCEEDED IN SECTOR	DOWNWIND SECTOR
S	100.	4.36E-06	1.50E-07	2.79E-08	7.21E-10	3.79E-12	6.18E-15	26.6	S
SSW	100.	4.12E-06	1.50E-07	2.85E-08	7.82E-10	4.47E-12	8.06E-15	21.7	SSW
SW	100.	4.12E-06	1.45E-07	2.72E-08	7.19E-10	3.91E-12	6.62E-15	21.6	SW
WSW	100.	4.18E-06	1.43E-07	2.65E-08	6.79E-10	3.53E-12	5.68E-15	25.1	WSW
W	100.	4.30E-06	1.30E-07	2.27E-08	5.11E-10	2.20E-12	2.82E-15	23.1	W
WNW	100.	4.27E-06	1.38E-07	2.49E-08	6.04E-10	2.89E-12	4.20E-15	24.3	WNW
NW	100.	4.46E-06	1.90E-07	3.91E-08	1.27E-09	9.32E-12	2.27E-14	26.5	NW
NNW	100.	4.94E-06	2.49E-07	5.58E-08	2.18E-09	2.07E-11	6.95E-14	35.6	NNW
N	100.	4.13E-06	1.59E-07	3.12E-08	9.12E-10	5.71E-12	1.15E-14	21.4	N
NNE	100.	5.21E-06	2.17E-07	4.44E-08	1.41E-09	1.00E-11	2.34E-14	41.1	NNE
NE	100.	5.08E-06	1.84E-07	3.50E-08	9.56E-10	5.44E-12	9.75E-15	39.0	NE
ENE	100.	4.79E-06	1.82E-07	3.53E-08	1.01E-09	6.19E-12	1.21E-14	34.2	ENE
E	100.	5.31E-06	2.09E-07	4.14E-08	1.24E-09	8.02E-12	1.68E-14	43.7	E
ESE	100.	5.13E-06	2.12E-07	4.31E-08	1.36E-09	9.47E-12	2.18E-14	40.2	ESE
SE	100.	5.20E-06	2.16E-07	4.40E-08	1.39E-09	9.81E-12	2.28E-14	41.0	SE
SSE	100.	4.94E-06	1.95E-07	3.86E-08	1.16E-09	7.50E-12	1.58E-14	34.3	SSE
MAX X/Q		5.31E-06				TOTAL HOURS AROUND SITE:		499.3	
SRP 2.3.4	100.	5.77E-06	2.83E-07	6.27E-08	2.38E-09	2.17E-11	6.95E-14		
SITE LIMIT		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.95E-14		

THE FIVE-PERCENT-FOR-THE-ENTIRE-SITE X/Q IS LIMITING.

X/Q VALUES (SEC/CUBIC METER) FOR FUMIGATION AT THE BOUNDARY:

DOWNWIND SECTOR	DISTANCE (METERS)	FUMIGATION X/Q
S	100.	5.03E-04
SSW	100.	5.03E-04
SW	100.	5.03E-04
WSW	100.	5.03E-04
W	100.	5.07E-04
WNW	100.	5.11E-04
NW	100.	5.22E-04
NNW	100.	5.28E-04
N	100.	5.04E-04
NNE	100.	5.03E-04
NE	100.	5.03E-04
ENE	100.	5.03E-04
E	100.	5.03E-04
ESE	100.	5.03E-04
SE	100.	5.03E-04
SSE	100.	5.03E-04

NOTE: VALUES ON THIS PAGE ARE APPROXIMATIONS ONLY.
CHECK THE REASONABLENESS OF THE ENVELOPES
COMPUTED FOR THE 0-2 HOUR VALUES. FOR ANY
FAULTY ENVELOPES, ADJUST THE ABOVE VALUES.

Station Chimney to Control Room Intake (150 and 200 m)

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  1  1111
Quad Cities                                   Elevated Release
90.2 meters          10.1-90.2 meters

QDC, Elevated Release, Control Room Intake, Station Chimney, Rev 1 met data
    7    0
1564. 43.7 85.8 90.2
    0    0    0    0    0    0    0
   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.
   4.   5.   4.   8.   2.   1.   3.   6.   5.   9.  10.  20.  18.  29.  23.  12.
  33.  45.  30.  25.  12.   9.  28.  57.  28.  90.  49.  47.  78.  59.  72.  73.
  20.  23.  28.  11.   5.  11.  28.  62.  69. 120.  24.  32.  47.  87. 102.  60.
   1.   3.   4.   5.   0.   5.   9.  21.  29.  35.   5.   3.  11.  44.  37.   9.
   1.   0.   2.   2.   0.   1.   0.   4.   3.  16.   0.   0.   2.   6.   8.   0.
   0.   0.   0.   0.   1.   0.   1.   1.   0.   0.   0.   2.   1.   1.   2.   0.
  22.  21.  22.  29.  17.  20.  16.  23.  18.  42.  46.  37.  48.  42.  31.  31.
  46.  53.  54.  29.  24.  41.  44.  69.  45.  99.  57.  64.  70.  65.  72.  53.
  15.  15.  25.  11.  12.  18.  29.  39.  26.  64.  39.  34.  72.  65.  58.  57.
   6.   4.   2.  11.   5.  12.   6.   9.  11.  27.  14.   3.  26.  32.  25.   5.
   0.   1.   1.   3.   0.   2.   1.   3.   3.   6.   4.   1.   7.  11.   8.   2.
   0.   0.   0.   0.   0.   2.   1.   1.   0.   4.   3.   4.   4.   3.   1.   1.
  42.  28.  34.  33.  38.  28.  30.  42.  30.  64.  65.  40.  56.  63.  65.  53.
  43.  54.  50.  31.  37.  39.  53.  69.  41.  93.  49.  60.  76.  69.  59.  61.
  23.  15.  33.  26.  20.  34.  33.  37.  32.  50.  43.  49.  78.  73.  76.  40.
   9.   6.   5.  13.   9.  12.   7.  12.  12.  28.  12.  12.  38.  47.  29.   9.
   1.   1.   0.   4.   2.   5.   0.   0.   5.  16.   3.   1.  17.  22.   8.   3.
  36.  19.  25.  30.  29.  31.  29.  34.  26.  29.  38.  28.  41.  29.  36.  24.
 157. 128. 156. 170. 268. 186. 167. 153. 135. 180. 173. 174. 196. 172. 227. 175.
 295. 260. 334. 351. 391. 296. 229. 264. 182. 208. 246. 275. 340. 519. 505. 308.
 337. 258. 353. 384. 330. 225. 251. 204. 236. 274. 244. 291. 578. 914. 678. 329.
  73. 107. 215. 234.  99. 152. 103.  98. 116. 164. 131. 112. 338. 485. 325. 109.
  25.  26.  71.  78.  16.  62.  43.  59.  71.  64.  51.  48. 233. 307. 113.  19.
  20.  14.   5.  17.  23.  22.  12.   5.  18.  12.  15.  16.   6.   5.  13.  16.
  77.  75.  88.  88. 149.  76.  78.  78.  69.  76.  81.  59.  67.  70.  74.  90.
 187. 159. 169. 182. 255. 211. 198. 219. 205. 264. 201. 168. 208. 204. 236. 247.
 209. 131. 158. 194. 162. 282. 301. 329. 408. 468. 438. 287. 348. 397. 308. 243.
  13.   8.  27.  46.  20.  89.  95. 145. 237. 310. 173.  49.  69.  51.  25.  10.
   1.   0.   4.   6.   4.  24.  14.  61.  85.  99.  24.   5.   4.   3.   0.   1.
  14.  19.  13.  17.  12.   6.   7.   9.  11.   9.   8.  14.  13.  15.   8.   8.
  46.  48.  52.  62.  72.  57.  46.  50.  46.  22.  48.  33.  45.  20.  41.  52.
 104.  75.  99.  80.  95. 113. 122. 205. 166. 179. 104.  72.  61.  60.  80. 108.
  54.  38.  47.  44.  40. 154. 234. 243. 255. 259.  92.  45.  63.  78.  57.  50.
   1.   0.   3.   2.   0.  26.  38.  29.  28.  31.  15.   2.   3.   7.   2.   2.
   0.   0.   0.   0.   0.   0.   0.   0.   0.   2.   0.   0.   0.   0.   0.   0.
  10.  11.   9.  14.  14.  10.   7.  11.   8.  11.   5.   1.   9.   7.   2.   8.
  23.  27.  26.  31.  24.  33.  45.  20.  39.  40.  44.  26.  28.  15.  12.  23.
  30.  23.  29.  28.  24.  48.  76.  99.  89.  88.  64.  23.  39.  27.  25.  16.
  15.  10.  10.   0.   5.  22.  74. 115.  91. 119.  30.   8.   9.  12.   9.  13.
   1.   0.   0.   0.   1.   6.  12.   6.   3.   6.   1.   1.   0.   1.   0.   0.
   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.
 101. 0.75 3.50 7.50 12.5 18.5 24.0 55.0
 150. 150. 150. 150. 150. 150. 150. 150. 150. 150. 150. 150. 150. 150. 150. 150.
 200. 200. 200. 200. 200. 200. 200. 200. 200. 200. 200. 200. 200. 200. 200. 200.
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USNRC COMPUTER CODE-PAVAN, VERSION 2.0 RUN DATE: 09/13/04

PRINTOUT OF INPUT CARDS

```
   1     00010 01111 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000   2     Quad Cities
Elevated Release
   3     90.2 meters         10.1-90.2 meters
   4
   5     QDC, Elevated Release, Control Room Intake, Station Chimney, Rev 1 met data        6          7 42727     0
   7          0.500  1564.000    43.700    85.800    90.200
   8       0.000  0.000  0.000  0.000  0.000  0.000  0.000
   9       0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000
   9       4.000  5.000  4.000  8.000  2.000  1.000  3.000  6.000  5.000  9.000 10.000 20.000 18.000 29.000 23.000 12.000
   9      33.000 45.000 30.000 25.000 12.000  9.000 28.000 57.000 28.000 90.000 49.000 47.000 78.000 59.000 72.000 73.000
   9      20.000 23.000 28.000 11.000  5.000 11.000 28.000 62.000 69.000120.000 24.000 32.000 47.000 87.000102.000 60.000
   9       1.000  3.000  4.000  5.000  0.000  5.000  9.000 21.000 29.000 35.000  5.000  3.000 11.000 44.000 37.000  9.000
   9       1.000  0.000  2.000  2.000  0.000  1.000  0.000  4.000  3.000 16.000  0.000  0.000  2.000  6.000  8.000  0.000
   9       0.000  0.000  0.000  0.000  1.000  0.000  1.000  1.000  0.000  0.000  0.000  2.000  1.000  1.000  2.000  0.000
   9      22.000 21.000 22.000 29.000 17.000 20.000 16.000 23.000 18.000 42.000 46.000 37.000 48.000 42.000 31.000 31.000
   9      46.000 53.000 54.000 29.000 24.000 41.000 44.000 69.000 45.000 99.000 57.000 64.000 70.000 65.000 72.000 53.000
   9      15.000 15.000 25.000 11.000 12.000 18.000 29.000 39.000 26.000 64.000 39.000 34.000 72.000 65.000 58.000 57.000
   9       6.000  4.000  2.000 11.000  5.000 12.000  6.000  9.000 11.000 27.000 14.000  3.000 26.000 32.000 25.000  5.000
   9       0.000  1.000  1.000  3.000  0.000  2.000  1.000  3.000  3.000  6.000  4.000  1.000  7.000 11.000  8.000  2.000
   9       0.000  0.000  0.000  0.000  0.000  2.000  1.000  1.000  0.000  4.000  3.000  4.000  4.000  3.000  1.000  1.000
   9      42.000 28.000 34.000 33.000 38.000 28.000 30.000 42.000 30.000 64.000 65.000 40.000 56.000 63.000 65.000 53.000
   9      43.000 54.000 50.000 31.000 37.000 39.000 53.000 69.000 41.000 93.000 49.000 60.000 76.000 69.000 59.000 61.000
   9      23.000 15.000 33.000 26.000 20.000 34.000 33.000 37.000 32.000 50.000 43.000 49.000 78.000 73.000 76.000 40.000
   9       9.000  6.000  5.000 13.000  9.000 12.000  7.000 12.000 12.000 28.000 12.000 12.000 38.000 47.000 29.000  9.000
   9       1.000  1.000  0.000  4.000  2.000  5.000  0.000  0.000  5.000 16.000  3.000  1.000 17.000 22.000  8.000  3.000
   9      36.000 19.000 25.000 30.000 29.000 31.000 29.000 34.000 26.000 29.000 38.000 28.000 41.000 29.000 36.000 24.000
   9     157.000128.000156.000170.000268.000186.000167.000153.000135.000180.000173.000174.000196.000172.000227.000175.000
   9     295.000260.000334.000351.000391.000296.000229.000264.000182.000208.000246.000275.000340.000519.000505.000308.000
   9     337.000258.000353.000384.000330.000225.000251.000204.000236.000274.000244.000291.000578.000914.000678.000329.000
   9      73.000107.000215.000234.000 99.000152.000103.000 98.000116.000164.000131.000112.000338.000485.000325.000109.000
   9      25.000 26.000 71.000 78.000 16.000 62.000 43.000 59.000 71.000 64.000 51.000 48.000233.000307.000113.000 19.000
   9      20.000 14.000  5.000 17.000 23.000 22.000 12.000  5.000 18.000 12.000 15.000 16.000  6.000  5.000 13.000 16.000
   9      77.000 75.000 88.000 88.000149.000 76.000 78.000 78.000 69.000 76.000 81.000 59.000 67.000 70.000 74.000 90.000
   9     187.000159.000169.000182.000255.000211.000198.000219.000205.000264.000201.000168.000208.000204.000236.000247.000
   9     209.000131.000158.000194.000162.000282.000301.000329.000408.000468.000438.000287.000348.000397.000308.000243.000
   9      13.000  8.000 27.000 46.000 20.000 89.000 95.000145.000237.000310.000173.000 49.000 69.000 51.000 25.000 10.000
   9       1.000  0.000  4.000  6.000  4.000 24.000 14.000 61.000 85.000 99.000 24.000  5.000  4.000  3.000  0.000  1.000
   9      14.000 19.000 13.000 17.000 12.000  6.000  7.000  9.000 11.000  9.000  8.000 14.000 13.000 15.000  8.000  8.000
   9      46.000 48.000 52.000 62.000 72.000 57.000 46.000 50.000 46.000 22.000 48.000 33.000 45.000 20.000 41.000 52.000
   9     104.000 75.000 99.000 80.000 95.000113.000122.000205.000166.000179.000104.000 72.000 61.000 60.000 80.000108.000
   9      54.000 38.000 47.000 44.000 40.000154.000234.000243.000255.000259.000 92.000 45.000 63.000 78.000 57.000 50.000
   9       1.000  0.000  3.000  2.000  0.000 26.000 38.000 29.000 28.000 31.000 15.000  2.000  3.000  7.000  2.000  2.000
   9       0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  2.000  0.000  0.000  0.000  0.000  0.000  0.000
   9      10.000 11.000  9.000 14.000 14.000 10.000  7.000 11.000  8.000 11.000  5.000  1.000  9.000  7.000  2.000  8.000
   9      23.000 27.000 26.000 31.000 24.000 33.000 45.000 20.000 39.000 40.000 44.000 26.000 28.000 15.000 12.000 23.000
   9      30.000 23.000 29.000 28.000 24.000 48.000 76.000 99.000 89.000 88.000 64.000 23.000 39.000 27.000 25.000 16.000
   9      15.000 10.000 10.000  0.000  5.000 22.000 74.000115.000 91.000119.000 30.000  8.000  9.000 12.000  9.000 13.000
   9       1.000  0.000  0.000  0.000  1.000  6.000 12.000  6.000  3.000  6.000  1.000  1.000  0.000  1.000  0.000  0.000
   9       0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  10          101.  0.750  3.500
7.500 12.500 18.500 24.000 55.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  11          150.   150.   150.   150.   150.   150.   150.   150.   150.
150.   150.   150.   150.   150.   150.   150.  11          200.   200.   200.   200.   200.   200.   200.   200.   200.   200.   200.   200.   200.   200.
200.   200.  12          1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0
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12	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0

USNRC COMPUTER CODE-PAVAN, VERSION 2.0 RUN DATE: 09/13/04

PLANT NAME: Quad Cities
DATA PERIOD:
TYPE OF RELEASE: Elevated Release
SOURCE OF DATA:
COMMENTS: QDC, Elevated Release, Control Room Intake, Station Chimney, Rev 1 met data
PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145

METEOROLOGICAL INSTRUMENTATION
WIND SENSORS HEIGHT: 90.2 meters
DELTA-T HEIGHTS: 10.1-90.2 meters

RELATIVE CONCENTRATION (X/Q) VALUES (SEC/CUBIC METER)
VERSUS
AVERAGING TIME

DOWNWIND SECTOR	DISTANCE (METERS)	0-2 HOURS	0-8 HOURS	8-24 HOURS	1-4 DAYS	4-30 DAYS	ANNUAL AVERAGE	HOURS PER YEAR MAX 0-2 HR X/Q IS EXCEEDED IN SECTOR	DOWNWIND SECTOR
S	150.	4.36E-06	5.96E-07	2.20E-07	2.54E-08	1.14E-09	2.57E-11	26.6	S
SSW	150.	4.12E-06	5.93E-07	2.25E-07	2.75E-08	1.34E-09	3.35E-11	21.7	SSW
SW	150.	4.12E-06	5.74E-07	2.14E-07	2.53E-08	1.18E-09	2.75E-11	21.6	SW
WSW	150.	4.18E-06	5.67E-07	2.09E-07	2.39E-08	1.06E-09	2.36E-11	25.1	WSW
W	150.	4.30E-06	5.06E-07	1.73E-07	1.70E-08	6.07E-10	1.03E-11	23.1	W
WNW	150.	4.27E-06	5.23E-07	1.83E-07	1.88E-08	7.15E-10	1.31E-11	24.3	WNW
NW	150.	4.46E-06	6.77E-07	2.64E-07	3.41E-08	1.81E-09	4.99E-11	26.5	NW
NNW	150.	4.94E-06	8.61E-07	3.59E-07	5.40E-08	3.55E-09	1.27E-10	35.6	NNW
N	150.	4.13E-06	6.29E-07	2.45E-07	3.18E-08	1.69E-09	4.67E-11	21.4	N
NNE	150.	5.21E-06	8.61E-07	3.50E-07	4.96E-08	3.01E-09	9.72E-11	41.1	NNE
NE	150.	5.08E-06	7.30E-07	2.77E-07	3.37E-08	1.64E-09	4.05E-11	39.0	NE
ENE	150.	4.79E-06	7.20E-07	2.79E-07	3.57E-08	1.86E-09	5.02E-11	34.2	ENE
E	150.	5.31E-06	8.28E-07	3.27E-07	4.36E-08	2.41E-09	6.99E-11	43.7	E
ESE	150.	5.13E-06	8.40E-07	3.40E-07	4.77E-08	2.85E-09	9.04E-11	40.2	ESE
SE	150.	5.20E-06	8.55E-07	3.47E-07	4.90E-08	2.95E-09	9.47E-11	41.0	SE
SSE	150.	4.94E-06	7.72E-07	3.05E-07	4.07E-08	2.26E-09	6.55E-11	34.3	SSE
MAX X/Q		5.31E-06				TOTAL HOURS AROUND SITE:		499.3	
SRP 2.3.4	150.	5.77E-06	9.79E-07	4.04E-07	5.90E-08	3.73E-09	1.27E-10		
SITE LIMIT		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.27E-10		

THE FIVE-PERCENT-FOR-THE-ENTIRE-SITE X/Q IS LIMITING.

X/Q VALUES (SEC/CUBIC METER) FOR FUMIGATION AT THE BOUNDARY:

DOWNWIND SECTOR	DISTANCE (METERS)	FUMIGATION X/Q
S	150.	3.49E-04
SSW	150.	3.49E-04
SW	150.	3.49E-04
WSW	150.	3.49E-04
W	150.	3.51E-04
WNW	150.	3.55E-04
NW	150.	3.62E-04
NNW	150.	3.66E-04
N	150.	3.49E-04
NNE	150.	3.49E-04
NE	150.	3.49E-04
ENE	150.	3.49E-04
E	150.	3.49E-04
ESE	150.	3.49E-04
SE	150.	3.49E-04
SSE	150.	3.49E-04

NOTE: VALUES ON THIS PAGE ARE APPROXIMATIONS ONLY.
CHECK THE REASONABLENESS OF THE ENVELOPES
COMPUTED FOR THE 0-2 HOUR VALUES. FOR ANY
FAULTY ENVELOPES, ADJUST THE ABOVE VALUES.

USNRC COMPUTER CODE-PAVAN, VERSION 2.0 RUN DATE: 09/13/04

PLANT NAME: Quad Cities
DATA PERIOD:
TYPE OF RELEASE: Elevated Release
SOURCE OF DATA:
COMMENTS: QDC, Elevated Release, Control Room Intake, Station Chimney, Rev 1 met data
PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145

METEOROLOGICAL INSTRUMENTATION
WIND SENSORS HEIGHT: 90.2 meters
DELTA-T HEIGHTS: 10.1-90.2 meters

RELATIVE CONCENTRATION (X/Q) VALUES (SEC/CUBIC METER)
VERSUS
AVERAGING TIME

DOWNWIND SECTOR	DISTANCE (METERS)	0-2 HOURS	0-8 HOURS	8-24 HOURS	1-4 DAYS	4-30 DAYS	ANNUAL AVERAGE	HOURS PER YEAR MAX 0-2 HR X/Q IS EXCEEDED IN SECTOR	DOWNWIND SECTOR
S	200.	4.36E-06	1.12E-06	5.66E-07	1.29E-07	1.55E-08	1.15E-09	26.6	S
SSW	200.	4.12E-06	1.11E-06	5.78E-07	1.40E-07	1.81E-08	1.50E-09	21.7	SSW
SW	200.	4.12E-06	1.08E-06	5.51E-07	1.29E-07	1.59E-08	1.24E-09	21.6	SW
WSW	200.	4.18E-06	1.06E-06	5.37E-07	1.21E-07	1.44E-08	1.06E-09	25.1	WSW
W	200.	4.30E-06	9.42E-07	4.41E-07	8.50E-08	8.00E-09	4.44E-10	23.1	W
WNW	200.	4.27E-06	9.65E-07	4.59E-07	9.16E-08	9.04E-09	5.32E-10	24.3	WNW
NW	200.	4.46E-06	1.21E-06	6.28E-07	1.52E-07	1.99E-08	1.65E-09	26.5	NW
NNW	200.	4.94E-06	1.51E-06	8.36E-07	2.31E-07	3.65E-08	3.82E-09	35.6	NNW
N	200.	4.13E-06	1.17E-06	6.26E-07	1.60E-07	2.26E-08	2.05E-09	21.4	N
NNE	200.	5.21E-06	1.61E-06	8.97E-07	2.51E-07	4.04E-08	4.32E-09	41.1	NNE
NE	200.	5.08E-06	1.37E-06	7.11E-07	1.71E-07	2.22E-08	1.82E-09	39.0	NE
ENE	200.	4.79E-06	1.35E-06	7.16E-07	1.81E-07	2.51E-08	2.24E-09	34.2	ENE
E	200.	5.31E-06	1.55E-06	8.39E-07	2.21E-07	3.25E-08	3.12E-09	43.7	E
ESE	200.	5.13E-06	1.57E-06	8.71E-07	2.42E-07	3.83E-08	4.02E-09	40.2	ESE
SE	200.	5.20E-06	1.60E-06	8.89E-07	2.48E-07	3.96E-08	4.20E-09	41.0	SE
SSE	200.	4.94E-06	1.44E-06	7.81E-07	2.06E-07	3.03E-08	2.91E-09	34.3	SSE
MAX X/Q		5.31E-06				TOTAL HOURS AROUND SITE:		499.3	
SRP 2.3.4	200.	5.77E-06	1.75E-06	9.68E-07	2.66E-07	4.17E-08	4.32E-09		
SITE LIMIT		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.32E-09		

THE FIVE-PERCENT-FOR-THE-ENTIRE-SITE X/Q IS LIMITING.

X/Q VALUES (SEC/CUBIC METER) FOR FUMIGATION AT THE BOUNDARY:

DOWNWIND SECTOR	DISTANCE (METERS)	FUMIGATION X/Q
S	200.	2.69E-04
SSW	200.	2.69E-04
SW	200.	2.69E-04
WSW	200.	2.69E-04
W	200.	2.71E-04
WNW	200.	2.73E-04
NW	200.	2.79E-04
NNW	200.	2.82E-04
N	200.	2.69E-04
NNE	200.	2.69E-04
NE	200.	2.69E-04
ENE	200.	2.69E-04
E	200.	2.69E-04
ESE	200.	2.69E-04
SE	200.	2.69E-04
SSE	200.	2.69E-04

NOTE: VALUES ON THIS PAGE ARE APPROXIMATIONS ONLY.
CHECK THE REASONABLENESS OF THE ENVELOPES
COMPUTED FOR THE 0-2 HOUR VALUES. FOR ANY
FAULTY ENVELOPES, ADJUST THE ABOVE VALUES.

Station Chimney to Control Room Intake (400 and 600 m)

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   1  1111
Quad Cities                                   Elevated Release
90.2 meters          10.1-90.2 meters

QDC, Elevated Release, Control Room Intake, Station Chimney, Rev 1 met data
    7    0
1564. 43.7 85.8 90.2
    0    0    0    0    0    0    0
   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.
   4.   5.   4.   8.   2.   1.   3.   6.   5.   9.  10.  20.  18.  29.  23.  12.
  33.  45.  30.  25.  12.   9.  28.  57.  28.  90.  49.  47.  78.  59.  72.  73.
  20.  23.  28.  11.   5.  11.  28.  62.  69. 120.  24.  32.  47.  87. 102.  60.
   1.   3.   4.   5.   0.   5.   9.  21.  29.  35.   5.   3.  11.  44.  37.   9.
   1.   0.   2.   2.   0.   1.   0.   4.   3.  16.   0.   0.   2.   6.   8.   0.
   0.   0.   0.   0.   1.   0.   1.   1.   0.   0.   0.   2.   1.   1.   2.   0.
  22.  21.  22.  29.  17.  20.  16.  23.  18.  42.  46.  37.  48.  42.  31.  31.
  46.  53.  54.  29.  24.  41.  44.  69.  45.  99.  57.  64.  70.  65.  72.  53.
  15.  15.  25.  11.  12.  18.  29.  39.  26.  64.  39.  34.  72.  65.  58.  57.
   6.   4.   2.  11.   5.  12.   6.   9.  11.  27.  14.   3.  26.  32.  25.   5.
   0.   1.   1.   3.   0.   2.   1.   3.   3.   6.   4.   1.   7.  11.   8.   2.
   0.   0.   0.   0.   0.   2.   1.   1.   0.   4.   3.   4.   4.   3.   1.   1.
  42.  28.  34.  33.  38.  28.  30.  42.  30.  64.  65.  40.  56.  63.  65.  53.
  43.  54.  50.  31.  37.  39.  53.  69.  41.  93.  49.  60.  76.  69.  59.  61.
  23.  15.  33.  26.  20.  34.  33.  37.  32.  50.  43.  49.  78.  73.  76.  40.
   9.   6.   5.  13.   9.  12.   7.  12.  12.  28.  12.  12.  38.  47.  29.   9.
   1.   1.   0.   4.   2.   5.   0.   0.   5.  16.   3.   1.  17.  22.   8.   3.
  36.  19.  25.  30.  29.  31.  29.  34.  26.  29.  38.  28.  41.  29.  36.  24.
 157. 128. 156. 170. 268. 186. 167. 153. 135. 180. 173. 174. 196. 172. 227. 175.
 295. 260. 334. 351. 391. 296. 229. 264. 182. 208. 246. 275. 340. 519. 505. 308.
 337. 258. 353. 384. 330. 225. 251. 204. 236. 274. 244. 291. 578. 914. 678. 329.
  73. 107. 215. 234.  99. 152. 103.  98. 116. 164. 131. 112. 338. 485. 325. 109.
  25.  26.  71.  78.  16.  62.  43.  59.  71.  64.  51.  48. 233. 307. 113.  19.
  20.  14.   5.  17.  23.  22.  12.   5.  18.  12.  15.  16.   6.   5.  13.  16.
  77.  75.  88.  88. 149.  76.  78.  78.  69.  76.  81.  59.  67.  70.  74.  90.
 187. 159. 169. 182. 255. 211. 198. 219. 205. 264. 201. 168. 208. 204. 236. 247.
 209. 131. 158. 194. 162. 282. 301. 329. 408. 468. 438. 287. 348. 397. 308. 243.
  13.   8.  27.  46.  20.  89.  95. 145. 237. 310. 173.  49.  69.  51.  25.  10.
   1.   0.   4.   6.   4.  24.  14.  61.  85.  99.  24.   5.   4.   3.   0.   1.
  14.  19.  13.  17.  12.   6.   7.   9.  11.   9.   8.  14.  13.  15.   8.   8.
  46.  48.  52.  62.  72.  57.  46.  50.  46.  22.  48.  33.  45.  20.  41.  52.
 104.  75.  99.  80.  95. 113. 122. 205. 166. 179. 104.  72.  61.  60.  80. 108.
  54.  38.  47.  44.  40. 154. 234. 243. 255. 259.  92.  45.  63.  78.  57.  50.
   1.   0.   3.   2.   0.  26.  38.  29.  28.  31.  15.   2.   3.   7.   2.   2.
   0.   0.   0.   0.   0.   0.   0.   0.   0.   2.   0.   0.   0.   0.   0.   0.
  10.  11.   9.  14.  14.  10.   7.  11.   8.  11.   5.   1.   9.   7.   2.   8.
  23.  27.  26.  31.  24.  33.  45.  20.  39.  40.  44.  26.  28.  15.  12.  23.
  30.  23.  29.  28.  24.  48.  76.  99.  89.  88.  64.  23.  39.  27.  25.  16.
  15.  10.  10.   0.   5.  22.  74. 115.  91. 119.  30.   8.   9.  12.   9.  13.
   1.   0.   0.   0.   1.   6.  12.   6.   3.   6.   1.   1.   0.   1.   0.   0.
   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.
 101. 0.75 3.50 7.50 12.5 18.5 24.0 55.0
 400. 400. 400. 400. 400. 400. 400. 400. 400. 400. 400. 400. 400. 400. 400. 400.
 600. 600. 600. 600. 600. 600. 600. 600. 600. 600. 600. 600. 600. 600. 600. 600.
   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.
   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.
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USNRC COMPUTER CODE-PAVAN, VERSION 2.0 RUN DATE: 09/13/04

PRINTOUT OF INPUT CARDS

```
   1     00010 01111 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000   2     Quad Cities
Elevated Release
   3     90.2 meters         10.1-90.2 meters
   4
   5     QDC, Elevated Release, Control Room Intake, Station Chimney, Rev 1 met data        6          7 42727     0.
   7          0.500  1564.000    43.700    85.800    90.200
   8       0.000  0.000  0.000  0.000  0.000  0.000  0.000
   9       0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000
   9       4.000  5.000  4.000  8.000  2.000  1.000  3.000  6.000  5.000  9.000 10.000 20.000 18.000 29.000 23.000 12.000
   9      33.000 45.000 30.000 25.000 12.000  9.000 28.000 57.000 28.000 90.000 49.000 47.000 78.000 59.000 72.000 73.000
   9      20.000 23.000 28.000 11.000  5.000 11.000 28.000 62.000 69.000120.000 24.000 32.000 47.000 87.000102.000 60.000
   9       1.000  3.000  4.000  5.000  0.000  5.000  9.000 21.000 29.000 35.000  5.000  3.000 11.000 44.000 37.000  9.000
   9       1.000  0.000  2.000  2.000  0.000  1.000  0.000  4.000  3.000 16.000  0.000  0.000  2.000  6.000  8.000  0.000
   9       0.000  0.000  0.000  0.000  1.000  0.000  1.000  1.000  0.000  0.000  0.000  2.000  1.000  1.000  2.000  0.000
   9      22.000 21.000 22.000 29.000 17.000 20.000 16.000 23.000 18.000 42.000 46.000 37.000 48.000 42.000 31.000 31.000
   9      46.000 53.000 54.000 29.000 24.000 41.000 44.000 69.000 45.000 99.000 57.000 64.000 70.000 65.000 72.000 53.000
   9      15.000 15.000 25.000 11.000 12.000 18.000 29.000 39.000 26.000 64.000 39.000 34.000 72.000 65.000 58.000 57.000
   9       6.000  4.000  2.000 11.000  5.000 12.000  6.000  9.000 11.000 27.000 14.000  3.000 26.000 32.000 25.000  5.000
   9       0.000  1.000  1.000  3.000  0.000  2.000  1.000  3.000  3.000  6.000  4.000  1.000  7.000 11.000  8.000  2.000
   9       0.000  0.000  0.000  0.000  0.000  2.000  1.000  1.000  0.000  4.000  3.000  4.000  4.000  3.000  1.000  1.000
   9      42.000 28.000 34.000 33.000 38.000 28.000 30.000 42.000 30.000 64.000 65.000 40.000 56.000 63.000 65.000 53.000
   9      43.000 54.000 50.000 31.000 37.000 39.000 53.000 69.000 41.000 93.000 49.000 60.000 76.000 69.000 59.000 61.000
   9      23.000 15.000 33.000 26.000 20.000 34.000 33.000 37.000 32.000 50.000 43.000 49.000 78.000 73.000 76.000 40.000
   9       9.000  6.000  5.000 13.000  9.000 12.000  7.000 12.000 12.000 28.000 12.000 12.000 38.000 47.000 29.000  9.000
   9       1.000  1.000  0.000  4.000  2.000  5.000  0.000  0.000  5.000 16.000  3.000  1.000 17.000 22.000  8.000  3.000
   9      36.000 19.000 25.000 30.000 29.000 31.000 29.000 34.000 26.000 29.000 38.000 28.000 41.000 29.000 36.000 24.000
   9     157.000128.000156.000170.000268.000186.000167.000153.000135.000180.000173.000174.000196.000172.000227.000175.000
   9     295.000260.000334.000351.000391.000296.000229.000264.000182.000208.000246.000275.000340.000519.000505.000308.000
   9     337.000258.000353.000384.000330.000225.000251.000204.000236.000274.000244.000291.000578.000914.000678.000329.000
   9      73.000107.000215.000234.000 99.000152.000103.000 98.000116.000164.000131.000112.000338.000485.000325.000109.000
   9      25.000 26.000 71.000 78.000 16.000 62.000 43.000 59.000 71.000 64.000 51.000 48.000233.000307.000113.000 19.000
   9      20.000 14.000  5.000 17.000 23.000 22.000 12.000  5.000 18.000 12.000 15.000 16.000  6.000  5.000 13.000 16.000
   9      77.000 75.000 88.000 88.000149.000 76.000 78.000 78.000 69.000 76.000 81.000 59.000 67.000 70.000 74.000 90.000
   9     187.000159.000169.000182.000255.000211.000198.000219.000205.000264.000201.000168.000208.000204.000236.000247.000
   9     209.000131.000158.000194.000162.000282.000301.000329.000408.000468.000438.000287.000348.000397.000308.000243.000
   9      13.000  8.000 27.000 46.000 20.000 89.000 95.000145.000237.000310.000173.000 49.000 69.000 51.000 25.000 10.000
   9       1.000  0.000  4.000  6.000  4.000 24.000 14.000 61.000 85.000 99.000 24.000  5.000  4.000  3.000  0.000  1.000
   9      14.000 19.000 13.000 17.000 12.000  6.000  7.000  9.000 11.000  9.000  8.000 14.000 13.000 15.000  8.000  8.000
   9      46.000 48.000 52.000 62.000 72.000 57.000 46.000 50.000 46.000 22.000 48.000 33.000 45.000 20.000 41.000 52.000
   9     104.000 75.000 99.000 80.000 95.000113.000122.000205.000166.000179.000104.000 72.000 61.000 60.000 80.000108.000
   9      54.000 38.000 47.000 44.000 40.000154.000234.000243.000255.000259.000 92.000 45.000 63.000 78.000 57.000 50.000
   9       1.000  0.000  3.000  2.000  0.000 26.000 38.000 29.000 28.000 31.000 15.000  2.000  3.000  7.000  2.000  2.000
   9       0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  2.000  0.000  0.000  0.000  0.000  0.000  0.000
   9      10.000 11.000  9.000 14.000 14.000 10.000  7.000 11.000  8.000 11.000  5.000  1.000  9.000  7.000  2.000  8.000
   9      23.000 27.000 26.000 31.000 24.000 33.000 45.000 20.000 39.000 40.000 44.000 26.000 28.000 15.000 12.000 23.000
   9      30.000 23.000 29.000 28.000 24.000 48.000 76.000 99.000 89.000 88.000 64.000 23.000 39.000 27.000 25.000 16.000
   9      15.000 10.000 10.000  0.000  5.000 22.000 74.000115.000 91.000119.000 30.000  8.000  9.000 12.000  9.000 13.000
   9       1.000  0.000  0.000  0.000  1.000  6.000 12.000  6.000  3.000  6.000  1.000  1.000  0.000  1.000  0.000  0.000
   9       0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  10        101.  0.750  3.500
7.500 12.500 18.500 24.000 55.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  11        400.   400.   400.   400.   400.   400.   400.   400.   400.
400.   400.   400.   400.   400.   400.   400.  11        600.   600.   600.   600.   600.   600.   600.   600.   600.   600.   600.   600.   600.   600.
600.   600.  12         1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0
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12	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0

USNRC COMPUTER CODE-PAVAN, VERSION 2.0 RUN DATE: 09/13/04

PLANT NAME: Quad Cities METEOROLOGICAL INSTRUMENTATION
DATA PERIOD: WIND SENSORS HEIGHT: 90.2 meters
TYPE OF RELEASE: Elevated Release DELTA-T HEIGHTS: 10.1-90.2 meters
SOURCE OF DATA:
COMMENTS: QDC, Elevated Release, Control Room Intake, Station Chimney, Rev 1 met data
PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145

RELATIVE CONCENTRATION (X/Q) VALUES (SEC/CUBIC METER)
VERSUS
AVERAGING TIME

DOWNWIND SECTOR	DISTANCE (METERS)	0-2 HOURS	0-8 HOURS	8-24 HOURS	1-4 DAYS	4-30 DAYS	ANNUAL AVERAGE	HOURS PER YEAR MAX 0-2 HR X/Q IS EXCEEDED IN SECTOR	DOWNWIND SECTOR
S	400.	4.36E-06	1.76E-06	1.12E-06	4.18E-07	1.02E-07	1.80E-08	26.6	S
SSW	400.	4.12E-06	1.73E-06	1.12E-06	4.35E-07	1.12E-07	2.13E-08	21.7	SSW
SW	400.	4.12E-06	1.70E-06	1.09E-06	4.19E-07	1.06E-07	1.96E-08	21.6	SW
WSW	400.	4.18E-06	1.68E-06	1.06E-06	3.96E-07	9.55E-08	1.68E-08	25.1	WSW
W	400.	4.30E-06	1.56E-06	9.42E-07	3.15E-07	6.51E-08	9.47E-09	23.1	W
WNW	400.	4.27E-06	1.62E-06	9.95E-07	3.47E-07	7.67E-08	1.21E-08	24.3	WNW
NW	400.	4.46E-06	1.83E-06	1.17E-06	4.46E-07	1.11E-07	2.04E-08	26.5	NW
NNW	400.	4.94E-06	2.21E-06	1.48E-06	6.17E-07	1.76E-07	3.80E-08	35.6	NNW
N	400.	4.13E-06	1.79E-06	1.18E-06	4.75E-07	1.29E-07	2.62E-08	21.4	N
NNE	400.	5.21E-06	2.47E-06	1.70E-06	7.56E-07	2.36E-07	5.68E-08	41.1	NNE
NE	400.	5.08E-06	2.17E-06	1.42E-06	5.64E-07	1.50E-07	2.97E-08	39.0	NE
ENE	400.	4.79E-06	2.10E-06	1.39E-06	5.69E-07	1.58E-07	3.28E-08	34.2	ENE
E	400.	5.31E-06	2.41E-06	1.63E-06	6.93E-07	2.03E-07	4.52E-08	43.7	E
ESE	400.	5.13E-06	2.41E-06	1.65E-06	7.23E-07	2.22E-07	5.23E-08	40.2	ESE
SE	400.	5.20E-06	2.43E-06	1.66E-06	7.30E-07	2.24E-07	5.27E-08	41.0	SE
SSE	400.	4.94E-06	2.21E-06	1.48E-06	6.16E-07	1.76E-07	3.79E-08	34.3	SSE
MAX X/Q		5.31E-06				TOTAL HOURS AROUND SITE:		499.3	
SRP 2.3.4	400.	5.77E-06	2.69E-06	1.83E-06	8.00E-07	2.44E-07	5.68E-08		
SITE LIMIT		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.68E-08		

THE FIVE-PERCENT-FOR-THE-ENTIRE-SITE X/Q IS LIMITING.

X/Q VALUES (SEC/CUBIC METER) FOR FUMIGATION AT THE BOUNDARY:

DOWNWIND SECTOR	DISTANCE (METERS)	FUMIGATION X/Q
S	400.	1.44E-04
SSW	400.	1.44E-04
SW	400.	1.44E-04
WSW	400.	1.44E-04
W	400.	1.45E-04
WNW	400.	1.46E-04
NW	400.	1.49E-04
NNW	400.	1.51E-04
N	400.	1.44E-04
NNE	400.	1.44E-04
NE	400.	1.44E-04
ENE	400.	1.44E-04
E	400.	1.44E-04
ESE	400.	1.44E-04
SE	400.	1.44E-04
SSE	400.	1.44E-04

NOTE: VALUES ON THIS PAGE ARE APPROXIMATIONS ONLY.
CHECK THE REASONABLENESS OF THE ENVELOPES
COMPUTED FOR THE 0-2 HOUR VALUES. FOR ANY
FAULTY ENVELOPES, ADJUST THE ABOVE VALUES.

USNRC COMPUTER CODE-PAVAN, VERSION 2.0 RUN DATE: 09/13/04

PLANT NAME: Quad Cities METEOROLOGICAL INSTRUMENTATION
DATA PERIOD: WIND SENSORS HEIGHT: 90.2 meters
TYPE OF RELEASE: Elevated Release DELTA-T HEIGHTS: 10.1-90.2 meters
SOURCE OF DATA:
COMMENTS: QDC, Elevated Release, Control Room Intake, Station Chimney, Rev 1 met data
PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145

RELATIVE CONCENTRATION (X/Q) VALUES (SEC/CUBIC METER)
VERSUS
AVERAGING TIME

DOWNWIND SECTOR	DISTANCE (METERS)	0-2 HOURS	0-8 HOURS	8-24 HOURS	1-4 DAYS	4-30 DAYS	ANNUAL AVERAGE	HOURS PER YEAR MAX 0-2 HR X/Q IS EXCEEDED IN SECTOR	DOWNWIND SECTOR
S	600.	4.09E-06	1.72E-06	1.11E-06	4.35E-07	1.13E-07	2.16E-08	29.8	S
SSW	600.	3.76E-06	1.62E-06	1.06E-06	4.24E-07	1.14E-07	2.28E-08	22.5	SSW
SW	600.	3.91E-06	1.68E-06	1.10E-06	4.38E-07	1.17E-07	2.33E-08	25.4	SW
WSW	600.	3.99E-06	1.66E-06	1.07E-06	4.14E-07	1.06E-07	1.99E-08	28.3	WSW
W	600.	4.24E-06	1.67E-06	1.04E-06	3.79E-07	8.86E-08	1.50E-08	30.1	W
WNW	600.	4.19E-06	1.71E-06	1.09E-06	4.14E-07	1.02E-07	1.86E-08	30.7	WNW
NW	600.	4.29E-06	1.82E-06	1.18E-06	4.66E-07	1.22E-07	2.38E-08	32.1	NW
NNW	600.	4.64E-06	2.10E-06	1.41E-06	5.95E-07	1.73E-07	3.80E-08	39.9	NNW
N	600.	3.79E-06	1.65E-06	1.09E-06	4.44E-07	1.22E-07	2.51E-08	23.6	N
NNE	600.	4.66E-06	2.24E-06	1.55E-06	7.03E-07	2.25E-07	5.56E-08	40.4	NNE
NE	600.	4.68E-06	2.09E-06	1.40E-06	5.83E-07	1.66E-07	3.58E-08	41.3	NE
ENE	600.	4.40E-06	1.99E-06	1.33E-06	5.62E-07	1.63E-07	3.57E-08	35.3	ENE
E	600.	4.81E-06	2.25E-06	1.54E-06	6.78E-07	2.08E-07	4.92E-08	43.7	E
ESE	600.	4.58E-06	2.18E-06	1.51E-06	6.73E-07	2.12E-07	5.15E-08	39.0	ESE
SE	600.	4.62E-06	2.18E-06	1.50E-06	6.65E-07	2.07E-07	4.94E-08	39.5	SE
SSE	600.	4.25E-06	1.94E-06	1.31E-06	5.60E-07	1.65E-07	3.71E-08	31.8	SSE
MAX X/Q		4.81E-06				TOTAL HOURS AROUND SITE:		533.4	
SRP 2.3.4	600.	5.42E-06	2.54E-06	1.74E-06	7.66E-07	2.36E-07	5.56E-08		
SITE LIMIT		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.56E-08		

THE FIVE-PERCENT-FOR-THE-ENTIRE-SITE X/Q IS LIMITING.

X/Q VALUES (SEC/CUBIC METER) FOR FUMIGATION AT THE BOUNDARY:

DOWNWIND SECTOR	DISTANCE (METERS)	FUMIGATION X/Q
S	600.	9.97E-05
SSW	600.	9.97E-05
SW	600.	9.97E-05
WSW	600.	9.97E-05
W	600.	1.00E-04
WNW	600.	1.01E-04
NW	600.	1.03E-04
NNW	600.	1.05E-04
N	600.	9.99E-05
NNE	600.	9.97E-05
NE	600.	9.97E-05
ENE	600.	9.97E-05
E	600.	9.97E-05
ESE	600.	9.97E-05
SE	600.	9.97E-05
SSE	600.	9.97E-05

NOTE: VALUES ON THIS PAGE ARE APPROXIMATIONS ONLY.
CHECK THE REASONABLENESS OF THE ENVELOPES
COMPUTED FOR THE 0-2 HOUR VALUES. FOR ANY
FAULTY ENVELOPES, ADJUST THE ABOVE VALUES.

Station Chimney to Control Room Intake (800 and 1000 m)

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   1  1111
Quad Cities                                  Elevated Release
90.2 meters          10.1-90.2 meters

QDC, Elevated Release, Control Room Intake, Station Chimney, Rev 1 met data
    7    0
1564. 43.7 85.8 90.2
    0    0    0    0    0    0    0
   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.
   4.   5.   4.   8.   2.   1.   3.   6.   5.   9.  10.  20.  18.  29.  23.  12.
  33.  45.  30.  25.  12.   9.  28.  57.  28.  90.  49.  47.  78.  59.  72.  73.
  20.  23.  28.  11.   5.  11.  28.  62.  69. 120.  24.  32.  47.  87. 102.  60.
   1.   3.   4.   5.   0.   5.   9.  21.  29.  35.   5.   3.  11.  44.  37.   9.
   1.   0.   2.   2.   0.   1.   0.   4.   3.  16.   0.   0.   2.   6.   8.   0.
   0.   0.   0.   0.   1.   0.   1.   1.   0.   0.   0.   2.   1.   1.   2.   0.
  22.  21.  22.  29.  17.  20.  16.  23.  18.  42.  46.  37.  48.  42.  31.  31.
  46.  53.  54.  29.  24.  41.  44.  69.  45.  99.  57.  64.  70.  65.  72.  53.
  15.  15.  25.  11.  12.  18.  29.  39.  26.  64.  39.  34.  72.  65.  58.  57.
   6.   4.   2.  11.   5.  12.   6.   9.  11.  27.  14.   3.  26.  32.  25.   5.
   0.   1.   1.   3.   0.   2.   1.   3.   3.   6.   4.   1.   7.  11.   8.   2.
   0.   0.   0.   0.   0.   2.   1.   1.   0.   4.   3.   4.   4.   3.   1.   1.
  42.  28.  34.  33.  38.  28.  30.  42.  30.  64.  65.  40.  56.  63.  65.  53.
  43.  54.  50.  31.  37.  39.  53.  69.  41.  93.  49.  60.  76.  69.  59.  61.
  23.  15.  33.  26.  20.  34.  33.  37.  32.  50.  43.  49.  78.  73.  76.  40.
   9.   6.   5.  13.   9.  12.   7.  12.  12.  28.  12.  12.  38.  47.  29.   9.
   1.   1.   0.   4.   2.   5.   0.   0.   5.  16.   3.   1.  17.  22.   8.   3.
  36.  19.  25.  30.  29.  31.  29.  34.  26.  29.  38.  28.  41.  29.  36.  24.
 157. 128. 156. 170. 268. 186. 167. 153. 135. 180. 173. 174. 196. 172. 227. 175.
 295. 260. 334. 351. 391. 296. 229. 264. 182. 208. 246. 275. 340. 519. 505. 308.
 337. 258. 353. 384. 330. 225. 251. 204. 236. 274. 244. 291. 578. 914. 678. 329.
  73. 107. 215. 234.  99. 152. 103.  98. 116. 164. 131. 112. 338. 485. 325. 109.
  25.  26.  71.  78.  16.  62.  43.  59.  71.  64.  51.  48. 233. 307. 113.  19.
  20.  14.   5.  17.  23.  22.  12.   5.  18.  12.  15.  16.   6.   5.  13.  16.
  77.  75.  88.  88. 149.  76.  78.  78.  69.  76.  81.  59.  67.  70.  74.  90.
 187. 159. 169. 182. 255. 211. 198. 219. 205. 264. 201. 168. 208. 204. 236. 247.
 209. 131. 158. 194. 162. 282. 301. 329. 408. 468. 438. 287. 348. 397. 308. 243.
  13.   8.  27.  46.  20.  89.  95. 145. 237. 310. 173.  49.  69.  51.  25.  10.
   1.   0.   4.   6.   4.  24.  14.  61.  85.  99.  24.   5.   4.   3.   0.   1.
  14.  19.  13.  17.  12.   6.   7.   9.  11.   9.   8.  14.  13.  15.   8.   8.
  46.  48.  52.  62.  72.  57.  46.  50.  46.  22.  48.  33.  45.  20.  41.  52.
 104.  75.  99.  80.  95. 113. 122. 205. 166. 179. 104.  72.  61.  60.  80. 108.
  54.  38.  47.  44.  40. 154. 234. 243. 255. 259.  92.  45.  63.  78.  57.  50.
   1.   0.   3.   2.   0.  26.  38.  29.  28.  31.  15.   2.   3.   7.   2.   2.
   0.   0.   0.   0.   0.   0.   0.   0.   0.   2.   0.   0.   0.   0.   0.   0.
  10.  11.   9.  14.  14.  10.   7.  11.   8.  11.   5.   1.   9.   7.   2.   8.
  23.  27.  26.  31.  24.  33.  45.  20.  39.  40.  44.  26.  28.  15.  12.  23.
  30.  23.  29.  28.  24.  48.  76.  99.  89.  88.  64.  23.  39.  27.  25.  16.
  15.  10.  10.   0.   5.  22.  74. 115.  91. 119.  30.   8.   9.  12.   9.  13.
   1.   0.   0.   0.   1.   6.  12.   6.   3.   6.   1.   1.   0.   1.   0.   0.
   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.
 101. 0.75 3.50 7.50 12.5 18.5 24.0 55.0
 800. 800. 800. 800. 800. 800. 800. 800. 800. 800. 800. 800. 800. 800. 800. 800.
1000.1000.1000.1000.1000.1000.1000.1000.1000.1000.1000.1000.1000.1000.1000.1000.
   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.
   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.
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USNRC COMPUTER CODE-PAVAN, VERSION 2.0 RUN DATE: 09/13/04

PRINTOUT OF INPUT CARDS

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   1     00010 01111 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000   2     Quad Cities
Elevated Release
   3     90.2 meters         10.1-90.2 meters
   4
   5     QDC, Elevated Release, Control Room Intake, Station Chimney, Rev 1 met data        6          7 42727     0
   7          0.500  1564.000    43.700    85.800    90.200
   8       0.000  0.000  0.000  0.000  0.000  0.000  0.000
   9       0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000
   9       4.000  5.000  4.000  8.000  2.000  1.000  3.000  6.000  5.000  9.000 10.000 20.000 18.000 29.000 23.000 12.000
   9      33.000 45.000 30.000 25.000 12.000  9.000 28.000 57.000 28.000 90.000 49.000 47.000 78.000 59.000 72.000 73.000
   9      20.000 23.000 28.000 11.000  5.000 11.000 28.000 62.000 69.000120.000 24.000 32.000 47.000 87.000102.000 60.000
   9       1.000  3.000  4.000  5.000  0.000  5.000  9.000 21.000 29.000 35.000  5.000  3.000 11.000 44.000 37.000  9.000
   9       1.000  0.000  2.000  2.000  0.000  1.000  0.000  4.000  3.000 16.000  0.000  0.000  2.000  6.000  8.000  0.000
   9       0.000  0.000  0.000  0.000  1.000  0.000  1.000  1.000  0.000  0.000  0.000  2.000  1.000  1.000  2.000  0.000
   9      22.000 21.000 22.000 29.000 17.000 20.000 16.000 23.000 18.000 42.000 46.000 37.000 48.000 42.000 31.000 31.000
   9      46.000 53.000 54.000 29.000 24.000 41.000 44.000 69.000 45.000 99.000 57.000 64.000 70.000 65.000 72.000 53.000
   9      15.000 15.000 25.000 11.000 12.000 18.000 29.000 39.000 26.000 64.000 39.000 34.000 72.000 65.000 58.000 57.000
   9       6.000  4.000  2.000 11.000  5.000 12.000  6.000  9.000 11.000 27.000 14.000  3.000 26.000 32.000 25.000  5.000
   9       0.000  1.000  1.000  3.000  0.000  2.000  1.000  3.000  3.000  6.000  4.000  1.000  7.000 11.000  8.000  2.000
   9       0.000  0.000  0.000  0.000  0.000  2.000  1.000  1.000  0.000  4.000  3.000  4.000  4.000  3.000  1.000  1.000
   9      42.000 28.000 34.000 33.000 38.000 28.000 30.000 42.000 30.000 64.000 65.000 40.000 56.000 63.000 65.000 53.000
   9      43.000 54.000 50.000 31.000 37.000 39.000 53.000 69.000 41.000 93.000 49.000 60.000 76.000 69.000 59.000 61.000
   9      23.000 15.000 33.000 26.000 20.000 34.000 33.000 37.000 32.000 50.000 43.000 49.000 78.000 73.000 76.000 40.000
   9       9.000  6.000  5.000 13.000  9.000 12.000  7.000 12.000 12.000 28.000 12.000 12.000 38.000 47.000 29.000  9.000
   9       1.000  1.000  0.000  4.000  2.000  5.000  0.000  0.000  5.000 16.000  3.000  1.000 17.000 22.000  8.000  3.000
   9      36.000 19.000 25.000 30.000 29.000 31.000 29.000 34.000 26.000 29.000 38.000 28.000 41.000 29.000 36.000 24.000
   9     157.000128.000156.000170.000268.000186.000167.000153.000135.000180.000173.000174.000196.000172.000227.000175.000
   9     295.000260.000334.000351.000391.000296.000229.000264.000182.000208.000246.000275.000340.000519.000505.000308.000
   9     337.000258.000353.000384.000330.000225.000251.000204.000236.000274.000244.000291.000578.000914.000678.000329.000
   9      73.000107.000215.000234.000 99.000152.000103.000 98.000116.000164.000131.000112.000338.000485.000325.000109.000
   9      25.000 26.000 71.000 78.000 16.000 62.000 43.000 59.000 71.000 64.000 51.000 48.000233.000307.000113.000 19.000
   9      20.000 14.000  5.000 17.000 23.000 22.000 12.000  5.000 18.000 12.000 15.000 16.000  6.000  5.000 13.000 16.000
   9      77.000 75.000 88.000 88.000149.000 76.000 78.000 78.000 69.000 76.000 81.000 59.000 67.000 70.000 74.000 90.000
   9     187.000159.000169.000182.000255.000211.000198.000219.000205.000264.000201.000168.000208.000204.000236.000247.000
   9     209.000131.000158.000194.000162.000282.000301.000329.000408.000468.000438.000287.000348.000397.000308.000243.000
   9      13.000  8.000 27.000 46.000 20.000 89.000 95.000145.000237.000310.000173.000 49.000 69.000 51.000 25.000 10.000
   9       1.000  0.000  4.000  6.000  4.000 24.000 14.000 61.000 85.000 99.000 24.000  5.000  4.000  3.000  0.000  1.000
   9      14.000 19.000 13.000 17.000 12.000  6.000  7.000  9.000 11.000  9.000  8.000 14.000 13.000 15.000  8.000  8.000
   9      46.000 48.000 52.000 62.000 72.000 57.000 46.000 50.000 46.000 22.000 48.000 33.000 45.000 20.000 41.000 52.000
   9     104.000 75.000 99.000 80.000 95.000113.000122.000205.000166.000179.000104.000 72.000 61.000 60.000 80.000108.000
   9      54.000 38.000 47.000 44.000 40.000154.000234.000243.000255.000259.000 92.000 45.000 63.000 78.000 57.000 50.000
   9       1.000  0.000  3.000  2.000  0.000 26.000 38.000 29.000 28.000 31.000 15.000  2.000  3.000  7.000  2.000  2.000
   9       0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  2.000  0.000  0.000  0.000  0.000  0.000  0.000
   9      10.000 11.000  9.000 14.000 14.000 10.000  7.000 11.000  8.000 11.000  5.000  1.000  9.000  7.000  2.000  8.000
   9      23.000 27.000 26.000 31.000 24.000 33.000 45.000 20.000 39.000 40.000 44.000 26.000 28.000 15.000 12.000 23.000
   9      30.000 23.000 29.000 28.000 24.000 48.000 76.000 99.000 89.000 88.000 64.000 23.000 39.000 27.000 25.000 16.000
   9      15.000 10.000 10.000  0.000  5.000 22.000 74.000115.000 91.000119.000 30.000  8.000  9.000 12.000  9.000 13.000
   9       1.000  0.000  0.000  0.000  1.000  6.000 12.000  6.000  3.000  6.000  1.000  1.000  0.000  1.000  0.000  0.000
   9       0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  10        101.  0.750  3.500
7.500 12.500 18.500 24.000 55.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  11        800.   800.   800.   800.   800.   800.   800.   800.   800.
800.   800.   800.   800.   800.   800.   800.  11        1000.  1000.  1000.  1000.  1000.  1000.  1000.  1000.  1000.  1000.  1000.  1000.  1000.
1000.  1000.  12         1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0
```

12	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0

USNRC COMPUTER CODE-PAVAN, VERSION 2.0 RUN DATE: 09/13/04

PLANT NAME: Quad Cities
DATA PERIOD:
TYPE OF RELEASE: Elevated Release
SOURCE OF DATA:
COMMENTS: QDC, Elevated Release, Control Room Intake, Station Chimney, Rev 1 met data
PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145

METEOROLOGICAL INSTRUMENTATION
WIND SENSORS HEIGHT: 90.2 meters
DELTA-T HEIGHTS: 10.1-90.2 meters

RELATIVE CONCENTRATION (X/Q) VALUES (SEC/CUBIC METER)
VERSUS
AVERAGING TIME

DOWNWIND SECTOR	DISTANCE (METERS)	0-2 HOURS	0-8 HOURS	8-24 HOURS	1-4 DAYS	4-30 DAYS	ANNUAL AVERAGE	HOURS PER YEAR MAX 0-2 HR X/Q IS EXCEEDED IN SECTOR	DOWNWIND SECTOR
S	800.	4.08E-06	1.73E-06	1.13E-06	4.46E-07	1.18E-07	2.30E-08	31.1	S
SSW	800.	3.72E-06	1.60E-06	1.05E-06	4.18E-07	1.12E-07	2.23E-08	22.4	SSW
SW	800.	3.87E-06	1.67E-06	1.10E-06	4.44E-07	1.21E-07	2.44E-08	25.5	SW
WSW	800.	3.93E-06	1.66E-06	1.08E-06	4.24E-07	1.11E-07	2.15E-08	28.3	WSW
W	800.	4.23E-06	1.73E-06	1.11E-06	4.21E-07	1.05E-07	1.91E-08	31.7	W
WNW	800.	4.17E-06	1.75E-06	1.13E-06	4.40E-07	1.14E-07	2.17E-08	31.4	WNW
NW	800.	4.25E-06	1.82E-06	1.19E-06	4.75E-07	1.27E-07	2.51E-08	32.7	NW
NNW	800.	4.59E-06	2.06E-06	1.38E-06	5.81E-07	1.67E-07	3.63E-08	40.7	NNW
N	800.	3.77E-06	1.63E-06	1.07E-06	4.31E-07	1.17E-07	2.35E-08	24.6	N
NNE	800.	4.65E-06	2.20E-06	1.52E-06	6.74E-07	2.10E-07	5.06E-08	42.1	NNE
NE	800.	4.66E-06	2.09E-06	1.40E-06	5.84E-07	1.67E-07	3.61E-08	42.7	NE
ENE	800.	4.27E-06	1.92E-06	1.29E-06	5.45E-07	1.58E-07	3.46E-08	33.8	ENE
E	800.	4.72E-06	2.21E-06	1.51E-06	6.66E-07	2.04E-07	4.82E-08	43.7	E
ESE	800.	4.54E-06	2.15E-06	1.48E-06	6.60E-07	2.06E-07	4.98E-08	40.0	ESE
SE	800.	4.60E-06	2.15E-06	1.47E-06	6.46E-07	1.98E-07	4.66E-08	40.9	SE
SSE	800.	4.23E-06	1.91E-06	1.29E-06	5.44E-07	1.58E-07	3.49E-08	33.1	SSE
MAX X/Q		4.72E-06				TOTAL HOURS AROUND SITE:		544.6	
SRP 2.3.4	800.	5.30E-06	2.46E-06	1.67E-06	7.26E-07	2.19E-07	5.06E-08		
SITE LIMIT		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.06E-08		

THE FIVE-PERCENT-FOR-THE-ENTIRE-SITE X/Q IS LIMITING.

X/Q VALUES (SEC/CUBIC METER) FOR FUMIGATION AT THE BOUNDARY:

DOWNWIND SECTOR	DISTANCE (METERS)	FUMIGATION X/Q
S	800.	7.69E-05
SSW	800.	7.69E-05
SW	800.	7.69E-05
WSW	800.	7.69E-05
W	800.	7.75E-05
WNW	800.	7.82E-05
NW	800.	7.98E-05
NNW	800.	8.07E-05
N	800.	7.70E-05
NNE	800.	7.69E-05
NE	800.	7.69E-05
ENE	800.	7.69E-05
E	800.	7.69E-05
ESE	800.	7.69E-05
SE	800.	7.69E-05
SSE	800.	7.69E-05

NOTE: VALUES ON THIS PAGE ARE APPROXIMATIONS ONLY.
CHECK THE REASONABLENESS OF THE ENVELOPES
COMPUTED FOR THE 0-2 HOUR VALUES. FOR ANY
FAULTY ENVELOPES, ADJUST THE ABOVE VALUES.

USNRC COMPUTER CODE-PAVAN, VERSION 2.0 RUN DATE: 09/13/04

PLANT NAME: Quad Cities
DATA PERIOD:
TYPE OF RELEASE: Elevated Release
SOURCE OF DATA:
COMMENTS: QDC, Elevated Release, Control Room Intake, Station Chimney, Rev 1 met data
PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145

METEOROLOGICAL INSTRUMENTATION
WIND SENSORS HEIGHT: 90.2 meters
DELTA-T HEIGHTS: 10.1-90.2 meters

RELATIVE CONCENTRATION (X/Q) VALUES (SEC/CUBIC METER)
VERSUS
AVERAGING TIME

DOWNWIND SECTOR	DISTANCE (METERS)	0-2 HOURS	0-8 HOURS	8-24 HOURS	1-4 DAYS	4-30 DAYS	ANNUAL AVERAGE	HOURS PER YEAR MAX 0-2 HR X/Q IS EXCEEDED IN SECTOR
S	1000.	3.81E-06	1.67E-06	1.11E-06	4.52E-07	1.25E-07	2.60E-08	33.6
SSW	1000.	3.46E-06	1.52E-06	1.00E-06	4.11E-07	1.14E-07	2.36E-08	23.7
SW	1000.	3.59E-06	1.60E-06	1.07E-06	4.47E-07	1.27E-07	2.74E-08	26.8
WSW	1000.	3.69E-06	1.62E-06	1.07E-06	4.40E-07	1.22E-07	2.55E-08	29.6
W	1000.	4.08E-06	1.76E-06	1.16E-06	4.64E-07	1.25E-07	2.52E-08	38.8
WNW	1000.	3.94E-06	1.71E-06	1.13E-06	4.59E-07	1.26E-07	2.58E-08	35.4
NW	1000.	4.04E-06	1.78E-06	1.18E-06	4.84E-07	1.35E-07	2.82E-08	38.1
NNW	1000.	4.24E-06	1.94E-06	1.31E-06	5.61E-07	1.66E-07	3.72E-08	43.7
N	1000.	3.52E-06	1.55E-06	1.03E-06	4.20E-07	1.17E-07	2.43E-08	26.8
NNE	1000.	4.16E-06	1.99E-06	1.37E-06	6.17E-07	1.95E-07	4.78E-08	41.4
NE	1000.	4.15E-06	1.90E-06	1.29E-06	5.52E-07	1.64E-07	3.69E-08	41.4
ENE	1000.	3.88E-06	1.78E-06	1.21E-06	5.19E-07	1.54E-07	3.50E-08	33.9
E	1000.	4.20E-06	2.02E-06	1.40E-06	6.31E-07	2.01E-07	4.97E-08	42.7
ESE	1000.	4.07E-06	1.98E-06	1.39E-06	6.36E-07	2.08E-07	5.30E-08	39.2
SE	1000.	4.23E-06	2.02E-06	1.40E-06	6.29E-07	1.99E-07	4.89E-08	43.4

SSE	1000.	3.90E-06	1.79E-06	1.21E-06	5.22E-07	1.55E-07	3.52E-08	34.7
SSE								
MAX X/Q		4.24E-06				TOTAL HOURS AROUND SITE:		573.2
SRP 2.3.4	1000.	4.86E-06	2.30E-06	1.58E-06	7.04E-07	2.20E-07	5.30E-08	
SITE LIMIT		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.30E-08	

THE FIVE-PERCENT-FOR-THE-ENTIRE-SITE X/Q IS LIMITING.

X/Q VALUES (SEC/CUBIC METER) FOR FUMIGATION AT THE BOUNDARY:

DOWNWIND SECTOR	DISTANCE (METERS)	FUMIGATION X/Q
S	1000.	6.29E-05
SSW	1000.	6.29E-05
SW	1000.	6.29E-05
WSW	1000.	6.29E-05
W	1000.	6.34E-05
WNW	1000.	6.39E-05
NW	1000.	6.52E-05
NNW	1000.	6.59E-05
N	1000.	6.30E-05
NNE	1000.	6.29E-05
NE	1000.	6.29E-05
ENE	1000.	6.29E-05
E	1000.	6.29E-05
ESE	1000.	6.29E-05
SE	1000.	6.29E-05
SSE	1000.	6.29E-05

NOTE: VALUES ON THIS PAGE ARE APPROXIMATIONS ONLY.
CHECK THE REASONABLENESS OF THE ENVELOPES
COMPUTED FOR THE 0-2 HOUR VALUES. FOR ANY
FAULTY ENVELOPES, ADJUST THE ABOVE VALUES.

Station Chimney to Control Room Intake (1500 and 2000 m)

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   1  1111
Quad Cities                                   Elevated Release
90.2 meters          10.1-90.2 meters

QDC, Elevated Release, Control Room Intake, Station Chimney, Rev 1 met data
    7    0
1564. 43.7 85.8 90.2
    0    0    0    0    0    0    0
   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.
   4.   5.   4.   8.   2.   1.   3.   6.   5.   9.  10.  20.  18.  29.  23.  12.
  33.  45.  30.  25.  12.   9.  28.  57.  28.  90.  49.  47.  78.  59.  72.  73.
  20.  23.  28.  11.   5.  11.  28.  62.  69. 120.  24.  32.  47.  87. 102.  60.
   1.   3.   4.   5.   0.   5.   9.  21.  29.  35.   5.   3.  11.  44.  37.   9.
   1.   0.   2.   2.   0.   1.   0.   4.   3.  16.   0.   0.   2.   6.   8.   0.
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  22.  21.  22.  29.  17.  20.  16.  23.  18.  42.  46.  37.  48.  42.  31.  31.
  46.  53.  54.  29.  24.  41.  44.  69.  45.  99.  57.  64.  70.  65.  72.  53.
  15.  15.  25.  11.  12.  18.  29.  39.  26.  64.  39.  34.  72.  65.  58.  57.
   6.   4.   2.  11.   5.  12.   6.   9.  11.  27.  14.   3.  26.  32.  25.   5.
   0.   1.   1.   3.   0.   2.   1.   3.   3.   6.   4.   1.   7.  11.   8.   2.
   0.   0.   0.   0.   0.   2.   1.   1.   0.   4.   3.   4.   4.   3.   1.   1.
  42.  28.  34.  33.  38.  28.  30.  42.  30.  64.  65.  40.  56.  63.  65.  53.
  43.  54.  50.  31.  37.  39.  53.  69.  41.  93.  49.  60.  76.  69.  59.  61.
  23.  15.  33.  26.  20.  34.  33.  37.  32.  50.  43.  49.  78.  73.  76.  40.
   9.   6.   5.  13.   9.  12.   7.  12.  12.  28.  12.  12.  38.  47.  29.   9.
   1.   1.   0.   4.   2.   5.   0.   0.   5.  16.   3.   1.  17.  22.   8.   3.
  36.  19.  25.  30.  29.  31.  29.  34.  26.  29.  38.  28.  41.  29.  36.  24.
 157. 128. 156. 170. 268. 186. 167. 153. 135. 180. 173. 174. 196. 172. 227. 175.
 295. 260. 334. 351. 391. 296. 229. 264. 182. 208. 246. 275. 340. 519. 505. 308.
 337. 258. 353. 384. 330. 225. 251. 204. 236. 274. 244. 291. 578. 914. 678. 329.
  73. 107. 215. 234.  99. 152. 103.  98. 116. 164. 131. 112. 338. 485. 325. 109.
  25.  26.  71.  78.  16.  62.  43.  59.  71.  64.  51.  48. 233. 307. 113.  19.
  20.  14.   5.  17.  23.  22.  12.   5.  18.  12.  15.  16.   6.   5.  13.  16.
  77.  75.  88.  88. 149.  76.  78.  78.  69.  76.  81.  59.  67.  70.  74.  90.
 187. 159. 169. 182. 255. 211. 198. 219. 205. 264. 201. 168. 208. 204. 236. 247.
 209. 131. 158. 194. 162. 282. 301. 329. 408. 468. 438. 287. 348. 397. 308. 243.
  13.   8.  27.  46.  20.  89.  95. 145. 237. 310. 173.  49.  69.  51.  25.  10.
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  14.  19.  13.  17.  12.   6.   7.   9.  11.   9.   8.  14.  13.  15.   8.   8.
  46.  48.  52.  62.  72.  57.  46.  50.  46.  22.  48.  33.  45.  20.  41.  52.
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  54.  38.  47.  44.  40. 154. 234. 243. 255. 259.  92.  45.  63.  78.  57.  50.
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   0.   0.   0.   0.   0.   0.   0.   0.   0.   2.   0.   0.   0.   0.   0.   0.
  10.  11.   9.  14.  14.  10.   7.  11.   8.  11.   5.   1.   9.   7.   2.   8.
  23.  27.  26.  31.  24.  33.  45.  20.  39.  40.  44.  26.  28.  15.  12.  23.
  30.  23.  29.  28.  24.  48.  76.  99.  89.  88.  64.  23.  39.  27.  25.  16.
  15.  10.  10.   0.   5.  22.  74. 115.  91. 119.  30.   8.   9.  12.   9.  13.
   1.   0.   0.   0.   1.   6.  12.   6.   3.   6.   1.   1.   0.   1.   0.   0.
   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.
 101. 0.75 3.50 7.50 12.5 18.5 24.0 55.0
1500.1500.1500.1500.1500.1500.1500.1500.1500.1500.1500.1500.1500.1500.1500.1500.
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2000.2000.2000.2000.2000.2000.2000.2000.2000.2000.2000.2000.2000.2000.2000.2000.
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   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.
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USNRC COMPUTER CODE-PAVAN, VERSION 2.0 RUN DATE: 09/13/04

PRINTOUT OF INPUT CARDS

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   1     00010 01111 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000   2     Quad Cities
Elevated Release
   3     90.2 meters         10.1-90.2 meters
   4
   5     QDC, Elevated Release, Control Room Intake, Station Chimney, Rev 1 met data        6          7 42727     0
   7          0.500  1564.000    43.700    85.800    90.200
   8       0.000  0.000  0.000  0.000  0.000  0.000  0.000
   9       0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000
   9       4.000  5.000  4.000  8.000  2.000  1.000  3.000  6.000  5.000  9.000 10.000 20.000 18.000 29.000 23.000 12.000
   9      33.000 45.000 30.000 25.000 12.000  9.000 28.000 57.000 28.000 90.000 49.000 47.000 78.000 59.000 72.000 73.000
   9      20.000 23.000 28.000 11.000  5.000 11.000 28.000 62.000 69.000120.000 24.000 32.000 47.000 87.000102.000 60.000
   9       1.000  3.000  4.000  5.000  0.000  5.000  9.000 21.000 29.000 35.000  5.000  3.000 11.000 44.000 37.000  9.000
   9       1.000  0.000  2.000  2.000  0.000  1.000  0.000  4.000  3.000 16.000  0.000  0.000  2.000  6.000  8.000  0.000
   9       0.000  0.000  0.000  0.000  1.000  0.000  1.000  1.000  0.000  0.000  0.000  2.000  1.000  1.000  2.000  0.000
   9      22.000 21.000 22.000 29.000 17.000 20.000 16.000 23.000 18.000 42.000 46.000 37.000 48.000 42.000 31.000 31.000
   9      46.000 53.000 54.000 29.000 24.000 41.000 44.000 69.000 45.000 99.000 57.000 64.000 70.000 65.000 72.000 53.000
   9      15.000 15.000 25.000 11.000 12.000 18.000 29.000 39.000 26.000 64.000 39.000 34.000 72.000 65.000 58.000 57.000
   9       6.000  4.000  2.000 11.000  5.000 12.000  6.000  9.000 11.000 27.000 14.000  3.000 26.000 32.000 25.000  5.000
   9       0.000  1.000  1.000  3.000  0.000  2.000  1.000  3.000  3.000  6.000  4.000  1.000  7.000 11.000  8.000  2.000
   9       0.000  0.000  0.000  0.000  0.000  2.000  1.000  1.000  0.000  4.000  3.000  4.000  4.000  3.000  1.000  1.000
   9      42.000 28.000 34.000 33.000 38.000 28.000 30.000 42.000 30.000 64.000 65.000 40.000 56.000 63.000 65.000 53.000
   9      43.000 54.000 50.000 31.000 37.000 39.000 53.000 69.000 41.000 93.000 49.000 60.000 76.000 69.000 59.000 61.000
   9      23.000 15.000 33.000 26.000 20.000 34.000 33.000 37.000 32.000 50.000 43.000 49.000 78.000 73.000 76.000 40.000
   9       9.000  6.000  5.000 13.000  9.000 12.000  7.000 12.000 12.000 28.000 12.000 12.000 38.000 47.000 29.000  9.000
   9       1.000  1.000  0.000  4.000  2.000  5.000  0.000  0.000  5.000 16.000  3.000  1.000 17.000 22.000  8.000  3.000
   9      36.000 19.000 25.000 30.000 29.000 31.000 29.000 34.000 26.000 29.000 38.000 28.000 41.000 29.000 36.000 24.000
   9     157.000128.000156.000170.000268.000186.000167.000153.000135.000180.000173.000174.000196.000172.000227.000175.000
   9     295.000260.000334.000351.000391.000296.000229.000264.000182.000208.000246.000275.000340.000519.000505.000308.000
   9     337.000258.000353.000384.000330.000225.000251.000204.000236.000274.000244.000291.000578.000914.000678.000329.000
   9      73.000107.000215.000234.000 99.000152.000103.000 98.000116.000164.000131.000112.000338.000485.000325.000109.000
   9      25.000 26.000 71.000 78.000 16.000 62.000 43.000 59.000 71.000 64.000 51.000 48.000233.000307.000113.000 19.000
   9      20.000 14.000  5.000 17.000 23.000 22.000 12.000  5.000 18.000 12.000 15.000 16.000  6.000  5.000 13.000 16.000
   9      77.000 75.000 88.000 88.000149.000 76.000 78.000 78.000 69.000 76.000 81.000 59.000 67.000 70.000 74.000 90.000
   9     187.000159.000169.000182.000255.000211.000198.000219.000205.000264.000201.000168.000208.000204.000236.000247.000
   9     209.000131.000158.000194.000162.000282.000301.000329.000408.000468.000438.000287.000348.000397.000308.000243.000
   9      13.000  8.000 27.000 46.000 20.000 89.000 95.000145.000237.000310.000173.000 49.000 69.000 51.000 25.000 10.000
   9       1.000  0.000  4.000  6.000  4.000 24.000 14.000 61.000 85.000 99.000 24.000  5.000  4.000  3.000  0.000  1.000
   9      14.000 19.000 13.000 17.000 12.000  6.000  7.000  9.000 11.000  9.000  8.000 14.000 13.000 15.000  8.000  8.000
   9      46.000 48.000 52.000 62.000 72.000 57.000 46.000 50.000 46.000 22.000 48.000 33.000 45.000 20.000 41.000 52.000
   9     104.000 75.000 99.000 80.000 95.000113.000122.000205.000166.000179.000104.000 72.000 61.000 60.000 80.000108.000
   9      54.000 38.000 47.000 44.000 40.000154.000234.000243.000255.000259.000 92.000 45.000 63.000 78.000 57.000 50.000
   9       1.000  0.000  3.000  2.000  0.000 26.000 38.000 29.000 28.000 31.000 15.000  2.000  3.000  7.000  2.000  2.000
   9       0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  2.000  0.000  0.000  0.000  0.000  0.000  0.000
   9      10.000 11.000  9.000 14.000 14.000 10.000  7.000 11.000  8.000 11.000  5.000  1.000  9.000  7.000  2.000  8.000
   9      23.000 27.000 26.000 31.000 24.000 33.000 45.000 20.000 39.000 40.000 44.000 26.000 28.000 15.000 12.000 23.000
   9      30.000 23.000 29.000 28.000 24.000 48.000 76.000 99.000 89.000 88.000 64.000 23.000 39.000 27.000 25.000 16.000
   9      15.000 10.000 10.000  0.000  5.000 22.000 74.000115.000 91.000119.000 30.000  8.000  9.000 12.000  9.000 13.000
   9       1.000  0.000  0.000  0.000  1.000  6.000 12.000  6.000  3.000  6.000  1.000  1.000  0.000  1.000  0.000  0.000
   9       0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  10        101.  0.750  3.500
7.500 12.500 18.500 24.000 55.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  11        1500.  1500.  1500.  1500.  1500.  1500.  1500.  1500.  1500.
1500.  1500.  1500.  1500.  1500.  1500.  1500.  11        2000.  2000.  2000.  2000.  2000.  2000.  2000.  2000.  2000.  2000.  2000.  2000.  2000.
2000.  2000.  12          1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0
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12	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0

USNRC COMPUTER CODE-PAVAN, VERSION 2.0 RUN DATE: 09/13/04

PLANT NAME: Quad Cities
DATA PERIOD:
TYPE OF RELEASE: Elevated Release
SOURCE OF DATA:
COMMENTS: QDC, Elevated Release, Control Room Intake, Station Chimney, Rev 1 met data
PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145

METEOROLOGICAL INSTRUMENTATION
WIND SENSORS HEIGHT: 90.2 meters
DELTA-T HEIGHTS: 10.1-90.2 meters

RELATIVE CONCENTRATION (X/Q) VALUES (SEC/CUBIC METER)
VERSUS
AVERAGING TIME

DOWNWIND SECTOR	DISTANCE (METERS)	0-2 HOURS	0-8 HOURS	8-24 HOURS	1-4 DAYS	4-30 DAYS	ANNUAL AVERAGE	HOURS PER YEAR MAX 0-2 HR X/Q IS EXCEEDED IN SECTOR	DOWNWIND SECTOR
S	1500.	3.46E-06	1.61E-06	1.10E-06	4.79E-07	1.45E-07	3.38E-08	32.8	S
SSW	1500.	3.05E-06	1.41E-06	9.58E-07	4.14E-07	1.24E-07	2.85E-08	22.5	SSW
SW	1500.	3.24E-06	1.54E-06	1.06E-06	4.71E-07	1.47E-07	3.55E-08	26.9	SW
WSW	1500.	3.41E-06	1.61E-06	1.10E-06	4.88E-07	1.51E-07	3.61E-08	31.0	WSW
W	1500.	3.90E-06	1.82E-06	1.24E-06	5.45E-07	1.66E-07	3.90E-08	43.7	W
WNW	1500.	3.68E-06	1.71E-06	1.16E-06	5.05E-07	1.53E-07	3.53E-08	37.8	WNW
NW	1500.	3.72E-06	1.72E-06	1.17E-06	5.09E-07	1.54E-07	3.55E-08	38.9	NW
NNW	1500.	3.82E-06	1.81E-06	1.24E-06	5.52E-07	1.72E-07	4.15E-08	41.7	NNW
N	1500.	3.18E-06	1.47E-06	9.95E-07	4.29E-07	1.28E-07	2.93E-08	26.3	N
NNE	1500.	3.60E-06	1.76E-06	1.23E-06	5.62E-07	1.83E-07	4.65E-08	35.5	NNE
NE	1500.	3.67E-06	1.74E-06	1.20E-06	5.35E-07	1.68E-07	4.06E-08	37.7	NE
ENE	1500.	3.49E-06	1.66E-06	1.14E-06	5.08E-07	1.59E-07	3.85E-08	32.8	ENE
E	1500.	3.73E-06	1.86E-06	1.32E-06	6.19E-07	2.10E-07	5.58E-08	39.6	E
ESE	1500.	3.60E-06	1.85E-06	1.33E-06	6.43E-07	2.27E-07	6.37E-08	35.4	ESE
SE	1500.	3.83E-06	1.92E-06	1.36E-06	6.42E-07	2.19E-07	5.86E-08	41.8	SE
SSE	1500.	3.48E-06	1.66E-06	1.14E-06	5.12E-07	1.61E-07	3.93E-08	31.6	SSE
MAX X/Q		3.90E-06				TOTAL HOURS AROUND SITE:		556.2	
SRP 2.3.4	1500.	4.57E-06	2.26E-06	1.58E-06	7.36E-07	2.45E-07	6.37E-08		
SITE LIMIT		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.37E-08		

THE FIVE-PERCENT-FOR-THE-ENTIRE-SITE X/Q IS LIMITING.

X/Q VALUES (SEC/CUBIC METER) FOR FUMIGATION AT THE BOUNDARY:

DOWNWIND SECTOR	DISTANCE (METERS)	FUMIGATION X/Q
S	1500.	4.36E-05
SSW	1500.	4.36E-05
SW	1500.	4.36E-05
WSW	1500.	4.36E-05
W	1500.	4.39E-05
WNW	1500.	4.43E-05
NW	1500.	4.52E-05
NNW	1500.	4.57E-05
N	1500.	4.37E-05
NNE	1500.	4.36E-05
NE	1500.	4.36E-05
ENE	1500.	4.36E-05
E	1500.	4.36E-05
ESE	1500.	4.36E-05
SE	1500.	4.36E-05
SSE	1500.	4.36E-05

NOTE: VALUES ON THIS PAGE ARE APPROXIMATIONS ONLY.
CHECK THE REASONABLENESS OF THE ENVELOPES
COMPUTED FOR THE 0-2 HOUR VALUES. FOR ANY
FAULTY ENVELOPES, ADJUST THE ABOVE VALUES.

USNRC COMPUTER CODE-PAVAN, VERSION 2.0 RUN DATE: 09/13/04

PLANT NAME: Quad Cities
DATA PERIOD:
TYPE OF RELEASE: Elevated Release
SOURCE OF DATA:
COMMENTS: QDC, Elevated Release, Control Room Intake, Station Chimney, Rev 1 met data
PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145

METEOROLOGICAL INSTRUMENTATION
WIND SENSORS HEIGHT: 90.2 meters
DELTA-T HEIGHTS: 10.1-90.2 meters

RELATIVE CONCENTRATION (X/Q) VALUES (SEC/CUBIC METER)
VERSUS
AVERAGING TIME

DOWNWIND SECTOR	DISTANCE (METERS)	0-2 HOURS	0-8 HOURS	8-24 HOURS	1-4 DAYS	4-30 DAYS	ANNUAL AVERAGE	HOURS PER YEAR MAX 0-2 HR X/Q IS EXCEEDED IN SECTOR	DOWNWIND SECTOR
S	2000.	3.42E-06	1.62E-06	1.11E-06	4.93E-07	1.54E-07	3.68E-08	33.9	S
SSW	2000.	3.01E-06	1.41E-06	9.62E-07	4.22E-07	1.29E-07	3.04E-08	23.4	SSW
SW	2000.	3.20E-06	1.54E-06	1.07E-06	4.83E-07	1.54E-07	3.82E-08	28.0	SW
WSW	2000.	3.37E-06	1.62E-06	1.12E-06	5.08E-07	1.63E-07	4.03E-08	32.2	WSW
W	2000.	3.80E-06	1.82E-06	1.26E-06	5.69E-07	1.81E-07	4.46E-08	43.7	W
WNW	2000.	3.53E-06	1.68E-06	1.15E-06	5.14E-07	1.61E-07	3.90E-08	36.3	WNW
NW	2000.	3.51E-06	1.66E-06	1.14E-06	5.08E-07	1.58E-07	3.80E-08	36.3	NW
NNW	2000.	3.60E-06	1.73E-06	1.20E-06	5.41E-07	1.72E-07	4.26E-08	38.8	NNW
N	2000.	3.13E-06	1.47E-06	1.01E-06	4.45E-07	1.37E-07	3.25E-08	27.2	N
NNE	2000.	3.56E-06	1.73E-06	1.21E-06	5.56E-07	1.82E-07	4.64E-08	36.6	NNE
NE	2000.	3.62E-06	1.73E-06	1.20E-06	5.39E-07	1.71E-07	4.20E-08	38.8	NE
ENE	2000.	3.43E-06	1.64E-06	1.13E-06	5.09E-07	1.61E-07	3.95E-08	33.6	ENE
E	2000.	3.68E-06	1.85E-06	1.31E-06	6.20E-07	2.12E-07	5.70E-08	40.5	E
ESE	2000.	3.52E-06	1.83E-06	1.32E-06	6.47E-07	2.33E-07	6.68E-08	35.6	ESE
SE	2000.	3.78E-06	1.91E-06	1.36E-06	6.51E-07	2.25E-07	6.16E-08	43.0	SE
SSE	2000.	3.44E-06	1.65E-06	1.14E-06	5.17E-07	1.65E-07	4.09E-08	32.6	SSE
MAX X/Q		3.80E-06				TOTAL HOURS AROUND SITE:		560.4	
SRP 2.3.4	2000.	4.40E-06	2.20E-06	1.56E-06	7.35E-07	2.50E-07	6.68E-08		
SITE LIMIT		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.68E-08		

THE FIVE-PERCENT-FOR-THE-ENTIRE-SITE X/Q IS LIMITING.

X/Q VALUES (SEC/CUBIC METER) FOR FUMIGATION AT THE BOUNDARY:

DOWNWIND SECTOR	DISTANCE (METERS)	FUMIGATION X/Q
S	2000.	3.36E-05
SSW	2000.	3.36E-05
SW	2000.	3.36E-05
WSW	2000.	3.36E-05
W	2000.	3.39E-05
WNW	2000.	3.42E-05
NW	2000.	3.49E-05
NNW	2000.	3.53E-05
N	2000.	3.37E-05
NNE	2000.	3.36E-05
NE	2000.	3.36E-05
ENE	2000.	3.36E-05
E	2000.	3.36E-05
ESE	2000.	3.36E-05
SE	2000.	3.36E-05
SSE	2000.	3.36E-05

NOTE: VALUES ON THIS PAGE ARE APPROXIMATIONS ONLY.
CHECK THE REASONABLENESS OF THE ENVELOPES
COMPUTED FOR THE 0-2 HOUR VALUES. FOR ANY
FAULTY ENVELOPES, ADJUST THE ABOVE VALUES.

Station Chimney to Control Room Intake (300 and 350 m)

```
   1  1111
Quad Cities                                   Elevated Release
90.2 meters          10.1-90.2 meters

QDC, Elevated Release, Control Room Intake, Station Chimney, Rev 1 met data
    7    0
1564. 43.7 85.8 90.2
    0    0    0    0    0    0    0
   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.
   4.   5.   4.   8.   2.   1.   3.   6.   5.   9.  10.  20.  18.  29.  23.  12.
  33.  45.  30.  25.  12.   9.  28.  57.  28.  90.  49.  47.  78.  59.  72.  73.
  20.  23.  28.  11.   5.  11.  28.  62.  69. 120.  24.  32.  47.  87. 102.  60.
   1.   3.   4.   5.   0.   5.   9.  21.  29.  35.   5.   3.  11.  44.  37.   9.
   1.   0.   2.   2.   0.   1.   0.   4.   3.  16.   0.   0.   2.   6.   8.   0.
   0.   0.   0.   0.   1.   0.   1.   1.   0.   0.   0.   2.   1.   1.   2.   0.
  22.  21.  22.  29.  17.  20.  16.  23.  18.  42.  46.  37.  48.  42.  31.  31.
  46.  53.  54.  29.  24.  41.  44.  69.  45.  99.  57.  64.  70.  65.  72.  53.
  15.  15.  25.  11.  12.  18.  29.  39.  26.  64.  39.  34.  72.  65.  58.  57.
   6.   4.   2.  11.   5.  12.   6.   9.  11.  27.  14.   3.  26.  32.  25.   5.
   0.   1.   1.   3.   0.   2.   1.   3.   3.   6.   4.   1.   7.  11.   8.   2.
   0.   0.   0.   0.   0.   2.   1.   1.   0.   4.   3.   4.   4.   3.   1.   1.
  42.  28.  34.  33.  38.  28.  30.  42.  30.  64.  65.  40.  56.  63.  65.  53.
  43.  54.  50.  31.  37.  39.  53.  69.  41.  93.  49.  60.  76.  69.  59.  61.
  23.  15.  33.  26.  20.  34.  33.  37.  32.  50.  43.  49.  78.  73.  76.  40.
   9.   6.   5.  13.   9.  12.   7.  12.  12.  28.  12.  12.  38.  47.  29.   9.
   1.   1.   0.   4.   2.   5.   0.   0.   5.  16.   3.   1.  17.  22.   8.   3.
  36.  19.  25.  30.  29.  31.  29.  34.  26.  29.  38.  28.  41.  29.  36.  24.
 157. 128. 156. 170. 268. 186. 167. 153. 135. 180. 173. 174. 196. 172. 227. 175.
 295. 260. 334. 351. 391. 296. 229. 264. 182. 208. 246. 275. 340. 519. 505. 308.
 337. 258. 353. 384. 330. 225. 251. 204. 236. 274. 244. 291. 578. 914. 678. 329.
  73. 107. 215. 234.  99. 152. 103.  98. 116. 164. 131. 112. 338. 485. 325. 109.
  25.  26.  71.  78.  16.  62.  43.  59.  71.  64.  51.  48. 233. 307. 113.  19.
  20.  14.   5.  17.  23.  22.  12.   5.  18.  12.  15.  16.   6.   5.  13.  16.
  77.  75.  88.  88. 149.  76.  78.  78.  69.  76.  81.  59.  67.  70.  74.  90.
 187. 159. 169. 182. 255. 211. 198. 219. 205. 264. 201. 168. 208. 204. 236. 247.
 209. 131. 158. 194. 162. 282. 301. 329. 408. 468. 438. 287. 348. 397. 308. 243.
  13.   8.  27.  46.  20.  89.  95. 145. 237. 310. 173.  49.  69.  51.  25.  10.
   1.   0.   4.   6.   4.  24.  14.  61.  85.  99.  24.   5.   4.   3.   0.   1.
  14.  19.  13.  17.  12.   6.   7.   9.  11.   9.   8.  14.  13.  15.   8.   8.
  46.  48.  52.  62.  72.  57.  46.  50.  46.  22.  48.  33.  45.  20.  41.  52.
 104.  75.  99.  80.  95. 113. 122. 205. 166. 179. 104.  72.  61.  60.  80. 108.
  54.  38.  47.  44.  40. 154. 234. 243. 255. 259.  92.  45.  63.  78.  57.  50.
   1.   0.   3.   2.   0.  26.  38.  29.  28.  31.  15.   2.   3.   7.   2.   2.
   0.   0.   0.   0.   0.   0.   0.   0.   0.   2.   0.   0.   0.   0.   0.   0.
  10.  11.   9.  14.  14.  10.   7.  11.   8.  11.   5.   1.   9.   7.   2.   8.
  23.  27.  26.  31.  24.  33.  45.  20.  39.  40.  44.  26.  28.  15.  12.  23.
  30.  23.  29.  28.  24.  48.  76.  99.  89.  88.  64.  23.  39.  27.  25.  16.
  15.  10.  10.   0.   5.  22.  74. 115.  91. 119.  30.   8.   9.  12.   9.  13.
   1.   0.   0.   0.   1.   6.  12.   6.   3.   6.   1.   1.   0.   1.   0.   0.
   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.
 101. 0.75 3.50 7.50 12.5 18.5 24.0 55.0
 300. 300. 300. 300. 300. 300. 300. 300. 300. 300. 300. 300. 300. 300. 300. 300.
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350. 350. 350. 350. 350. 350. 350. 350. 350. 350. 350. 350. 350. 350. 350. 350.
  1.   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.
  1.   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.
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USNRC COMPUTER CODE-PAVAN, VERSION 2.0 RUN DATE: 09/14/04

PRINTOUT OF INPUT CARDS

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   1     00010 01111 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000   2     Quad Cities
Elevated Release
   3     90.2 meters         10.1-90.2 meters
   4
   5     QDC, Elevated Release, Control Room Intake, Station Chimney, Rev 1 met data        6          7 42727     0
   7          0.500  1564.000    43.700    85.800    90.200
   8       0.000  0.000  0.000  0.000  0.000  0.000  0.000
   9       0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000
   9       4.000  5.000  4.000  8.000  2.000  1.000  3.000  6.000  5.000  9.000 10.000 20.000 18.000 29.000 23.000 12.000
   9      33.000 45.000 30.000 25.000 12.000  9.000 28.000 57.000 28.000 90.000 49.000 47.000 78.000 59.000 72.000 73.000
   9      20.000 23.000 28.000 11.000  5.000 11.000 28.000 62.000 69.000120.000 24.000 32.000 47.000 87.000102.000 60.000
   9       1.000  3.000  4.000  5.000  0.000  5.000  9.000 21.000 29.000 35.000  5.000  3.000 11.000 44.000 37.000  9.000
   9       1.000  0.000  2.000  2.000  0.000  1.000  0.000  4.000  3.000 16.000  0.000  0.000  2.000  6.000  8.000  0.000
   9       0.000  0.000  0.000  0.000  1.000  0.000  1.000  1.000  0.000  0.000  0.000  2.000  1.000  1.000  2.000  0.000
   9      22.000 21.000 22.000 29.000 17.000 20.000 16.000 23.000 18.000 42.000 46.000 37.000 48.000 42.000 31.000 31.000
   9      46.000 53.000 54.000 29.000 24.000 41.000 44.000 69.000 45.000 99.000 57.000 64.000 70.000 65.000 72.000 53.000
   9      15.000 15.000 25.000 11.000 12.000 18.000 29.000 39.000 26.000 64.000 39.000 34.000 72.000 65.000 58.000 57.000
   9       6.000  4.000  2.000 11.000  5.000 12.000  6.000  9.000 11.000 27.000 14.000  3.000 26.000 32.000 25.000  5.000
   9       0.000  1.000  1.000  3.000  0.000  2.000  1.000  3.000  3.000  6.000  4.000  1.000  7.000 11.000  8.000  2.000
   9       0.000  0.000  0.000  0.000  0.000  2.000  1.000  1.000  0.000  4.000  3.000  4.000  4.000  3.000  1.000  1.000
   9      42.000 28.000 34.000 33.000 38.000 28.000 30.000 42.000 30.000 64.000 65.000 40.000 56.000 63.000 65.000 53.000
   9      43.000 54.000 50.000 31.000 37.000 39.000 53.000 69.000 41.000 93.000 49.000 60.000 76.000 69.000 59.000 61.000
   9      23.000 15.000 33.000 26.000 20.000 34.000 33.000 37.000 32.000 50.000 43.000 49.000 78.000 73.000 76.000 40.000
   9       9.000  6.000  5.000 13.000  9.000 12.000  7.000 12.000 12.000 28.000 12.000 12.000 38.000 47.000 29.000  9.000
   9       1.000  1.000  0.000  4.000  2.000  5.000  0.000  0.000  5.000 16.000  3.000  1.000 17.000 22.000  8.000  3.000
   9      36.000 19.000 25.000 30.000 29.000 31.000 29.000 34.000 26.000 29.000 38.000 28.000 41.000 29.000 36.000 24.000
   9     157.000128.000156.000170.000268.000186.000167.000153.000135.000180.000173.000174.000196.000172.000227.000175.000
   9     295.000260.000334.000351.000391.000296.000229.000264.000182.000208.000246.000275.000340.000519.000505.000308.000
   9     337.000258.000353.000384.000330.000225.000251.000204.000236.000274.000244.000291.000578.000914.000678.000329.000
   9      73.000107.000215.000234.000 99.000152.000103.000 98.000116.000164.000131.000112.000338.000485.000325.000109.000
   9      25.000 26.000 71.000 78.000 16.000 62.000 43.000 59.000 71.000 64.000 51.000 48.000233.000307.000113.000 19.000
   9      20.000 14.000  5.000 17.000 23.000 22.000 12.000  5.000 18.000 12.000 15.000 16.000  6.000  5.000 13.000 16.000
   9      77.000 75.000 88.000 88.000149.000 76.000 78.000 78.000 69.000 76.000 81.000 59.000 67.000 70.000 74.000 90.000
   9     187.000159.000169.000182.000255.000211.000198.000219.000205.000264.000201.000168.000208.000204.000236.000247.000
   9     209.000131.000158.000194.000162.000282.000301.000329.000408.000468.000438.000287.000348.000397.000308.000243.000
   9      13.000  8.000 27.000 46.000 20.000 89.000 95.000145.000237.000310.000173.000 49.000 69.000 51.000 25.000 10.000
   9       1.000  0.000  4.000  6.000  4.000 24.000 14.000 61.000 85.000 99.000 24.000  5.000  4.000  3.000  0.000  1.000
   9      14.000 19.000 13.000 17.000 12.000  6.000  7.000  9.000 11.000  9.000  8.000 14.000 13.000 15.000  8.000  8.000
   9      46.000 48.000 52.000 62.000 72.000 57.000 46.000 50.000 46.000 22.000 48.000 33.000 45.000 20.000 41.000 52.000
   9     104.000 75.000 99.000 80.000 95.000113.000122.000205.000166.000179.000104.000 72.000 61.000 60.000 80.000108.000
   9      54.000 38.000 47.000 44.000 40.000154.000234.000243.000255.000259.000 92.000 45.000 63.000 78.000 57.000 50.000
   9       1.000  0.000  3.000  2.000  0.000 26.000 38.000 29.000 28.000 31.000 15.000  2.000  3.000  7.000  2.000  2.000
   9       0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  2.000  0.000  0.000  0.000  0.000  0.000  0.000
   9      10.000 11.000  9.000 14.000 14.000 10.000  7.000 11.000  8.000 11.000  5.000  1.000  9.000  7.000  2.000  8.000
   9      23.000 27.000 26.000 31.000 24.000 33.000 45.000 20.000 39.000 40.000 44.000 26.000 28.000 15.000 12.000 23.000
   9      30.000 23.000 29.000 28.000 24.000 48.000 76.000 99.000 89.000 88.000 64.000 23.000 39.000 27.000 25.000 16.000
   9      15.000 10.000 10.000  0.000  5.000 22.000 74.000115.000 91.000119.000 30.000  8.000  9.000 12.000  9.000 13.000
   9       1.000  0.000  0.000  0.000  1.000  6.000 12.000  6.000  3.000  6.000  1.000  1.000  0.000  1.000  0.000  0.000
   9       0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  10        101.  0.750  3.500
7.500 12.500 18.500 24.000 55.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  11        300.   300.   300.   300.   300.   300.   300.   300.   300.
300.   300.   300.   300.   300.   300.   300.  11        350.   350.   350.   350.   350.   350.   350.   350.   350.   350.   350.   350.   350.   350.
350.   350.  12         1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0
```

12	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0

USNRC COMPUTER CODE-PAVAN, VERSION 2.0 RUN DATE: 09/14/04

PLANT NAME: Quad Cities
DATA PERIOD:
TYPE OF RELEASE: Elevated Release
SOURCE OF DATA:
COMMENTS: QDC, Elevated Release, Control Room Intake, Station Chimney, Rev 1 met data
PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145

METEOROLOGICAL INSTRUMENTATION
WIND SENSORS HEIGHT: 90.2 meters
DELTA-T HEIGHTS: 10.1-90.2 meters

RELATIVE CONCENTRATION (X/Q) VALUES (SEC/CUBIC METER)
VERSUS
AVERAGING TIME

DOWNWIND SECTOR	DISTANCE (METERS)	0-2 HOURS	0-8 HOURS	8-24 HOURS	1-4 DAYS	4-30 DAYS	ANNUAL AVERAGE	HOURS PER YEAR MAX 0-2 HR X/Q IS EXCEEDED IN SECTOR	DOWNWIND SECTOR
S	300.	4.36E-06	1.63E-06	1.00E-06	3.45E-07	7.47E-08	1.15E-08	26.6	S
SSW	300.	4.12E-06	1.62E-06	1.01E-06	3.68E-07	8.59E-08	1.45E-08	21.7	SSW
SW	300.	4.12E-06	1.58E-06	9.77E-07	3.45E-07	7.74E-08	1.24E-08	21.6	SW
WSW	300.	4.18E-06	1.56E-06	9.51E-07	3.26E-07	7.00E-08	1.07E-08	25.1	WSW
W	300.	4.30E-06	1.40E-06	8.02E-07	2.38E-07	4.16E-08	4.93E-09	23.1	W
WNW	300.	4.27E-06	1.44E-06	8.38E-07	2.58E-07	4.77E-08	6.03E-09	24.3	WNW
NW	300.	4.46E-06	1.71E-06	1.06E-06	3.74E-07	8.42E-08	1.36E-08	26.5	NW
NNW	300.	4.94E-06	2.10E-06	1.37E-06	5.42E-07	1.43E-07	2.80E-08	35.6	NNW
N	300.	4.13E-06	1.70E-06	1.09E-06	4.14E-07	1.04E-07	1.90E-08	21.4	N
NNE	300.	5.21E-06	2.34E-06	1.56E-06	6.55E-07	1.88E-07	4.06E-08	41.1	NNE
NE	300.	5.08E-06	2.01E-06	1.26E-06	4.61E-07	1.09E-07	1.85E-08	39.0	NE
ENE	300.	4.79E-06	1.97E-06	1.26E-06	4.79E-07	1.20E-07	2.19E-08	34.2	ENE
E	300.	5.31E-06	2.26E-06	1.48E-06	5.84E-07	1.54E-07	3.04E-08	43.7	E
ESE	300.	5.13E-06	2.28E-06	1.52E-06	6.28E-07	1.77E-07	3.76E-08	40.2	ESE
SE	300.	5.20E-06	2.31E-06	1.54E-06	6.41E-07	1.82E-07	3.88E-08	41.0	SE
SSE	300.	4.94E-06	2.09E-06	1.36E-06	5.35E-07	1.40E-07	2.73E-08	34.3	SSE
MAX X/Q		5.31E-06				TOTAL HOURS AROUND SITE:		499.3	
SRP 2.3.4	300.	5.77E-06	2.54E-06	1.69E-06	6.94E-07	1.94E-07	4.06E-08		
SITE LIMIT		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.06E-08		

THE FIVE-PERCENT-FOR-THE-ENTIRE-SITE X/Q IS LIMITING.

X/Q VALUES (SEC/CUBIC METER) FOR FUMIGATION AT THE BOUNDARY:

DOWNWIND SECTOR	DISTANCE (METERS)	FUMIGATION X/Q
S	300.	1.87E-04
SSW	300.	1.87E-04
SW	300.	1.87E-04
WSW	300.	1.87E-04
W	300.	1.88E-04
WNW	300.	1.90E-04
NW	300.	1.93E-04
NNW	300.	1.96E-04
N	300.	1.87E-04
NNE	300.	1.87E-04
NE	300.	1.87E-04
ENE	300.	1.87E-04
E	300.	1.87E-04
ESE	300.	1.87E-04
SE	300.	1.87E-04
SSE	300.	1.87E-04

NOTE: VALUES ON THIS PAGE ARE APPROXIMATIONS ONLY.
CHECK THE REASONABLENESS OF THE ENVELOPES
COMPUTED FOR THE 0-2 HOUR VALUES. FOR ANY
FAULTY ENVELOPES, ADJUST THE ABOVE VALUES.

USNRC COMPUTER CODE-PAVAN, VERSION 2.0 RUN DATE: 09/14/04

PLANT NAME: Quad Cities
DATA PERIOD:
TYPE OF RELEASE: Elevated Release
SOURCE OF DATA:
COMMENTS: QDC, Elevated Release, Control Room Intake, Station Chimney, Rev 1 met data
PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145

METEOROLOGICAL INSTRUMENTATION
WIND SENSORS HEIGHT: 90.2 meters
DELTA-T HEIGHTS: 10.1-90.2 meters

RELATIVE CONCENTRATION (X/Q) VALUES (SEC/CUBIC METER)
VERSUS
AVERAGING TIME

DOWNWIND SECTOR	DISTANCE (METERS)	0-2 HOURS	0-8 HOURS	8-24 HOURS	1-4 DAYS	4-30 DAYS	ANNUAL AVERAGE	HOURS PER YEAR MAX 0-2 HR X/Q IS EXCEEDED IN SECTOR	DOWNWIND SECTOR
S	350.	4.50E-06	1.76E-06	1.10E-06	3.99E-07	9.28E-08	1.56E-08	26.6	S
SSW	350.	4.22E-06	1.73E-06	1.11E-06	4.20E-07	1.04E-07	1.90E-08	21.7	SSW
SW	350.	4.17E-06	1.68E-06	1.06E-06	3.96E-07	9.59E-08	1.69E-08	20.6	SW
WSW	350.	4.29E-06	1.67E-06	1.05E-06	3.77E-07	8.69E-08	1.45E-08	24.9	WSW
W	350.	4.34E-06	1.51E-06	8.93E-07	2.84E-07	5.50E-08	7.38E-09	21.6	W
WNW	350.	4.27E-06	1.55E-06	9.32E-07	3.10E-07	6.40E-08	9.26E-09	22.0	WNW
NW	350.	4.51E-06	1.81E-06	1.14E-06	4.24E-07	1.02E-07	1.78E-08	24.8	NW
NNW	350.	5.14E-06	2.25E-06	1.49E-06	6.09E-07	1.69E-07	3.50E-08	36.5	NNW
N	350.	4.23E-06	1.80E-06	1.18E-06	4.66E-07	1.23E-07	2.42E-08	21.3	N
NNE	350.	5.41E-06	2.51E-06	1.71E-06	7.44E-07	2.25E-07	5.21E-08	41.1	NNE
NE	350.	5.30E-06	2.19E-06	1.41E-06	5.40E-07	1.36E-07	2.54E-08	39.0	NE
ENE	350.	4.97E-06	2.12E-06	1.39E-06	5.52E-07	1.47E-07	2.90E-08	34.0	ENE
E	350.	5.50E-06	2.44E-06	1.62E-06	6.71E-07	1.89E-07	4.01E-08	43.7	E
ESE	350.	5.34E-06	2.45E-06	1.66E-06	7.13E-07	2.12E-07	4.81E-08	40.2	ESE
SE	350.	5.40E-06	2.48E-06	1.68E-06	7.24E-07	2.16E-07	4.91E-08	41.0	SE
SSE	350.	5.16E-06	2.26E-06	1.49E-06	6.09E-07	1.68E-07	3.48E-08	34.3	SSE
MAX X/Q		5.50E-06				TOTAL HOURS AROUND SITE:		493.5	
SRP 2.3.4	350.	5.84E-06	2.68E-06	1.81E-06	7.77E-07	2.30E-07	5.21E-08		
SITE LIMIT		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.21E-08		

THE FIVE-PERCENT-FOR-THE-ENTIRE-SITE X/Q IS LIMITING.

X/Q VALUES (SEC/CUBIC METER) FOR FUMIGATION AT THE BOUNDARY:

DOWNWIND SECTOR	DISTANCE (METERS)	FUMIGATION X/Q
S	350.	1.62E-04
SSW	350.	1.62E-04
SW	350.	1.62E-04
WSW	350.	1.62E-04
W	350.	1.63E-04
WNW	350.	1.65E-04
NW	350.	1.68E-04
NNW	350.	1.70E-04
N	350.	1.62E-04
NNE	350.	1.62E-04
NE	350.	1.62E-04
ENE	350.	1.62E-04
E	350.	1.62E-04
ESE	350.	1.62E-04
SE	350.	1.62E-04
SSE	350.	1.62E-04

NOTE: VALUES ON THIS PAGE ARE APPROXIMATIONS ONLY.
CHECK THE REASONABLENESS OF THE ENVELOPES
COMPUTED FOR THE 0-2 HOUR VALUES. FOR ANY
FAULTY ENVELOPES, ADJUST THE ABOVE VALUES.

Station Chimney to Control Room Intake (375 and 425 m)

```
   1  1111
Quad Cities                                  Elevated Release
90.2 meters          10.1-90.2 meters

QDC, Elevated Release, Control Room Intake, Station Chimney, Rev 1 met data
    7    0
1564. 43.7 85.8 90.2
    0    0    0    0    0    0    0
   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.
   4.   5.   4.   8.   2.   1.   3.   6.   5.   9.  10.  20.  18.  29.  23.  12.
  33.  45.  30.  25.  12.   9.  28.  57.  28.  90.  49.  47.  78.  59.  72.  73.
  20.  23.  28.  11.   5.  11.  28.  62.  69. 120.  24.  32.  47.  87. 102.  60.
   1.   3.   4.   5.   0.   5.   9.  21.  29.  35.   5.   3.  11.  44.  37.   9.
   1.   0.   2.   2.   0.   1.   0.   4.   3.  16.   0.   0.   2.   6.   8.   0.
   0.   0.   0.   0.   1.   0.   1.   1.   0.   0.   0.   2.   1.   1.   2.   0.
  22.  21.  22.  29.  17.  20.  16.  23.  18.  42.  46.  37.  48.  42.  31.  31.
  46.  53.  54.  29.  24.  41.  44.  69.  45.  99.  57.  64.  70.  65.  72.  53.
  15.  15.  25.  11.  12.  18.  29.  39.  26.  64.  39.  34.  72.  65.  58.  57.
   6.   4.   2.  11.   5.  12.   6.   9.  11.  27.  14.   3.  26.  32.  25.   5.
   0.   1.   1.   3.   0.   2.   1.   3.   3.   6.   4.   1.   7.  11.   8.   2.
   0.   0.   0.   0.   0.   2.   1.   1.   0.   4.   3.   4.   4.   3.   1.   1.
  42.  28.  34.  33.  38.  28.  30.  42.  30.  64.  65.  40.  56.  63.  65.  53.
  43.  54.  50.  31.  37.  39.  53.  69.  41.  93.  49.  60.  76.  69.  59.  61.
  23.  15.  33.  26.  20.  34.  33.  37.  32.  50.  43.  49.  78.  73.  76.  40.
   9.   6.   5.  13.   9.  12.   7.  12.  12.  28.  12.  12.  38.  47.  29.   9.
   1.   1.   0.   4.   2.   5.   0.   0.   5.  16.   3.   1.  17.  22.   8.   3.
  36.  19.  25.  30.  29.  31.  29.  34.  26.  29.  38.  28.  41.  29.  36.  24.
 157. 128. 156. 170. 268. 186. 167. 153. 135. 180. 173. 174. 196. 172. 227. 175.
 295. 260. 334. 351. 391. 296. 229. 264. 182. 208. 246. 275. 340. 519. 505. 308.
 337. 258. 353. 384. 330. 225. 251. 204. 236. 274. 244. 291. 578. 914. 678. 329.
  73. 107. 215. 234.  99. 152. 103.  98. 116. 164. 131. 112. 338. 485. 325. 109.
  25.  26.  71.  78.  16.  62.  43.  59.  71.  64.  51.  48. 233. 307. 113.  19.
  20.  14.   5.  17.  23.  22.  12.   5.  18.  12.  15.  16.   6.   5.  13.  16.
  77.  75.  88.  88. 149.  76.  78.  78.  69.  76.  81.  59.  67.  70.  74.  90.
 187. 159. 169. 182. 255. 211. 198. 219. 205. 264. 201. 168. 208. 204. 236. 247.
 209. 131. 158. 194. 162. 282. 301. 329. 408. 468. 438. 287. 348. 397. 308. 243.
  13.   8.  27.  46.  20.  89.  95. 145. 237. 310. 173.  49.  69.  51.  25.  10.
   1.   0.   4.   6.   4.  24.  14.  61.  85.  99.  24.   5.   4.   3.   0.   1.
  14.  19.  13.  17.  12.   6.   7.   9.  11.   9.   8.  14.  13.  15.   8.   8.
  46.  48.  52.  62.  72.  57.  46.  50.  46.  22.  48.  33.  45.  20.  41.  52.
 104.  75.  99.  80.  95. 113. 122. 205. 166. 179. 104.  72.  61.  60.  80. 108.
  54.  38.  47.  44.  40. 154. 234. 243. 255. 259.  92.  45.  63.  78.  57.  50.
   1.   0.   3.   2.   0.  26.  38.  29.  28.  31.  15.   2.   3.   7.   2.   2.
   0.   0.   0.   0.   0.   0.   0.   0.   0.   2.   0.   0.   0.   0.   0.   0.
  10.  11.   9.  14.  14.  10.   7.  11.   8.  11.   5.   1.   9.   7.   2.   8.
  23.  27.  26.  31.  24.  33.  45.  20.  39.  40.  44.  26.  28.  15.  12.  23.
  30.  23.  29.  28.  24.  48.  76.  99.  89.  88.  64.  23.  39.  27.  25.  16.
  15.  10.  10.   0.   5.  22.  74. 115.  91. 119.  30.   8.   9.  12.   9.  13.
   1.   0.   0.   0.   1.   6.  12.   6.   3.   6.   1.   1.   0.   1.   0.   0.
   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.
 101. 0.75 3.50 7.50 12.5 18.5 24.0 55.0
 375. 375. 375. 375. 375. 375. 375. 375. 375. 375. 375. 375. 375. 375. 375. 375.
 425. 425. 425. 425. 425. 425. 425. 425. 425. 425. 425. 425. 425. 425. 425. 425.
   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.
   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.
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USNRC COMPUTER CODE-PAVAN, VERSION 2.0 RUN DATE: 09/14/04

PRINTOUT OF INPUT CARDS

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   1     00010 01111 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000   2     Quad Cities
Elevated Release
   3     90.2 meters         10.1-90.2 meters
   4
   5     QDC, Elevated Release, Control Room Intake, Station Chimney, Rev 1 met data        6          7 42727     0
   7          0.500  1564.000    43.700    85.800    90.200
   8       0.000  0.000  0.000  0.000  0.000  0.000  0.000
   9       0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000
   9       4.000  5.000  4.000  8.000  2.000  1.000  3.000  6.000  5.000  9.000 10.000 20.000 18.000 29.000 23.000 12.000
   9      33.000 45.000 30.000 25.000 12.000  9.000 28.000 57.000 28.000 90.000 49.000 47.000 78.000 59.000 72.000 73.000
   9      20.000 23.000 28.000 11.000  5.000 11.000 28.000 62.000 69.000120.000 24.000 32.000 47.000 87.000102.000 60.000
   9       1.000  3.000  4.000  5.000  0.000  5.000  9.000 21.000 29.000 35.000  5.000  3.000 11.000 44.000 37.000  9.000
   9       1.000  0.000  2.000  2.000  0.000  1.000  0.000  4.000  3.000 16.000  0.000  0.000  2.000  6.000  8.000  0.000
   9       0.000  0.000  0.000  0.000  1.000  0.000  1.000  1.000  0.000  0.000  0.000  2.000  1.000  1.000  2.000  0.000
   9      22.000 21.000 22.000 29.000 17.000 20.000 16.000 23.000 18.000 42.000 46.000 37.000 48.000 42.000 31.000 31.000
   9      46.000 53.000 54.000 29.000 24.000 41.000 44.000 69.000 45.000 99.000 57.000 64.000 70.000 65.000 72.000 53.000
   9      15.000 15.000 25.000 11.000 12.000 18.000 29.000 39.000 26.000 64.000 39.000 34.000 72.000 65.000 58.000 57.000
   9       6.000  4.000  2.000 11.000  5.000 12.000  6.000  9.000 11.000 27.000 14.000  3.000 26.000 32.000 25.000  5.000
   9       0.000  1.000  1.000  3.000  0.000  2.000  1.000  3.000  3.000  6.000  4.000  1.000  7.000 11.000  8.000  2.000
   9       0.000  0.000  0.000  0.000  0.000  2.000  1.000  1.000  0.000  4.000  3.000  4.000  4.000  3.000  1.000  1.000
   9      42.000 28.000 34.000 33.000 38.000 28.000 30.000 42.000 30.000 64.000 65.000 40.000 56.000 63.000 65.000 53.000
   9      43.000 54.000 50.000 31.000 37.000 39.000 53.000 69.000 41.000 93.000 49.000 60.000 76.000 69.000 59.000 61.000
   9      23.000 15.000 33.000 26.000 20.000 34.000 33.000 37.000 32.000 50.000 43.000 49.000 78.000 73.000 76.000 40.000
   9       9.000  6.000  5.000 13.000  9.000 12.000  7.000 12.000 12.000 28.000 12.000 12.000 38.000 47.000 29.000  9.000
   9       1.000  1.000  0.000  4.000  2.000  5.000  0.000  0.000  5.000 16.000  3.000  1.000 17.000 22.000  8.000  3.000
   9      36.000 19.000 25.000 30.000 29.000 31.000 29.000 34.000 26.000 29.000 38.000 28.000 41.000 29.000 36.000 24.000
   9     157.000128.000156.000170.000268.000186.000167.000153.000135.000180.000173.000174.000196.000172.000227.000175.000
   9     295.000260.000334.000351.000391.000296.000229.000264.000182.000208.000246.000275.000340.000519.000505.000308.000
   9     337.000258.000353.000384.000330.000225.000251.000204.000236.000274.000244.000291.000578.000914.000678.000329.000
   9      73.000107.000215.000234.000 99.000152.000103.000 98.000116.000164.000131.000112.000338.000485.000325.000109.000
   9      25.000 26.000 71.000 78.000 16.000 62.000 43.000 59.000 71.000 64.000 51.000 48.000233.000307.000113.000 19.000
   9      20.000 14.000  5.000 17.000 23.000 22.000 12.000  5.000 18.000 12.000 15.000 16.000  6.000  5.000 13.000 16.000
   9      77.000 75.000 88.000 88.000149.000 76.000 78.000 78.000 69.000 76.000 81.000 59.000 67.000 70.000 74.000 90.000
   9     187.000159.000169.000182.000255.000211.000198.000219.000205.000264.000201.000168.000208.000204.000236.000247.000
   9     209.000131.000158.000194.000162.000282.000301.000329.000408.000468.000438.000287.000348.000397.000308.000243.000
   9      13.000  8.000 27.000 46.000 20.000 89.000 95.000145.000237.000310.000173.000 49.000 69.000 51.000 25.000 10.000
   9       1.000  0.000  4.000  6.000  4.000 24.000 14.000 61.000 85.000 99.000 24.000  5.000  4.000  3.000  0.000  1.000
   9      14.000 19.000 13.000 17.000 12.000  6.000  7.000  9.000 11.000  9.000  8.000 14.000 13.000 15.000  8.000  8.000
   9      46.000 48.000 52.000 62.000 72.000 57.000 46.000 50.000 46.000 22.000 48.000 33.000 45.000 20.000 41.000 52.000
   9     104.000 75.000 99.000 80.000 95.000113.000122.000205.000166.000179.000104.000 72.000 61.000 60.000 80.000108.000
   9      54.000 38.000 47.000 44.000 40.000154.000234.000243.000255.000259.000 92.000 45.000 63.000 78.000 57.000 50.000
   9       1.000  0.000  3.000  2.000  0.000 26.000 38.000 29.000 28.000 31.000 15.000  2.000  3.000  7.000  2.000  2.000
   9       0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  2.000  0.000  0.000  0.000  0.000  0.000  0.000
   9      10.000 11.000  9.000 14.000 14.000 10.000  7.000 11.000  8.000 11.000  5.000  1.000  9.000  7.000  2.000  8.000
   9      23.000 27.000 26.000 31.000 24.000 33.000 45.000 20.000 39.000 40.000 44.000 26.000 28.000 15.000 12.000 23.000
   9      30.000 23.000 29.000 28.000 24.000 48.000 76.000 99.000 89.000 88.000 64.000 23.000 39.000 27.000 25.000 16.000
   9      15.000 10.000 10.000  0.000  5.000 22.000 74.000115.000 91.000119.000 30.000  8.000  9.000 12.000  9.000 13.000
   9       1.000  0.000  0.000  0.000  1.000  6.000 12.000  6.000  3.000  6.000  1.000  1.000  0.000  1.000  0.000  0.000
   9       0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  10        101.  0.750  3.500
7.500 12.500 18.500 24.000 55.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  11        375.   375.   375.   375.   375.   375.   375.   375.   375.
375.   375.   375.   375.   375.   375.   375.  11        425.   425.   425.   425.   425.   425.   425.   425.   425.   425.   425.   425.   425.   425.
425.   425.  12         1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0
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12	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0

USNRC COMPUTER CODE-PAVAN, VERSION 2.0 RUN DATE: 09/14/04

PLANT NAME: Quad Cities
DATA PERIOD:
TYPE OF RELEASE: Elevated Release
SOURCE OF DATA:
COMMENTS: QDC, Elevated Release, Control Room Intake, Station Chimney, Rev 1 met data
PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145

METEOROLOGICAL INSTRUMENTATION
WIND SENSORS HEIGHT: 90.2 meters
DELTA-T HEIGHTS: 10.1-90.2 meters

RELATIVE CONCENTRATION (X/Q) VALUES (SEC/CUBIC METER)
VERSUS
AVERAGING TIME

DOWNWIND SECTOR	DISTANCE (METERS)	0-2 HOURS	0-8 HOURS	8-24 HOURS	1-4 DAYS	4-30 DAYS	ANNUAL AVERAGE	HOURS PER YEAR MAX 0-2 HR X/Q IS EXCEEDED IN SECTOR	DOWNWIND SECTOR
S	375.	4.48E-06	1.78E-06	1.12E-06	4.13E-07	9.82E-08	1.69E-08	26.6	S
SSW	375.	4.21E-06	1.74E-06	1.12E-06	4.32E-07	1.09E-07	2.04E-08	21.7	SSW
SW	375.	4.16E-06	1.70E-06	1.09E-06	4.11E-07	1.02E-07	1.84E-08	20.6	SW
WSW	375.	4.27E-06	1.69E-06	1.07E-06	3.90E-07	9.22E-08	1.58E-08	24.9	WSW
W	375.	4.32E-06	1.54E-06	9.20E-07	3.01E-07	6.04E-08	8.47E-09	21.5	W
WNW	375.	4.27E-06	1.59E-06	9.67E-07	3.30E-07	7.07E-08	1.07E-08	22.3	WNW
NW	375.	4.49E-06	1.82E-06	1.16E-06	4.37E-07	1.07E-07	1.93E-08	24.6	NW
NNW	375.	5.05E-06	2.24E-06	1.49E-06	6.17E-07	1.74E-07	3.68E-08	34.9	NNW
N	375.	4.22E-06	1.81E-06	1.19E-06	4.75E-07	1.27E-07	2.55E-08	21.3	N
NNE	375.	5.38E-06	2.52E-06	1.73E-06	7.60E-07	2.33E-07	5.51E-08	41.1	NNE
NE	375.	5.27E-06	2.21E-06	1.43E-06	5.60E-07	1.45E-07	2.78E-08	39.0	NE
ENE	375.	4.95E-06	2.14E-06	1.41E-06	5.68E-07	1.54E-07	3.12E-08	34.0	ENE
E	375.	5.47E-06	2.46E-06	1.65E-06	6.90E-07	1.98E-07	4.31E-08	43.7	E
ESE	375.	5.31E-06	2.46E-06	1.68E-06	7.28E-07	2.20E-07	5.07E-08	40.2	ESE
SE	375.	5.37E-06	2.49E-06	1.70E-06	7.37E-07	2.23E-07	5.15E-08	41.0	SE
SSE	375.	5.13E-06	2.27E-06	1.51E-06	6.21E-07	1.74E-07	3.68E-08	34.3	SSE
MAX X/Q		5.47E-06				TOTAL HOURS AROUND SITE:		491.7	
SRP 2.3.4	375.	5.80E-06	2.69E-06	1.83E-06	7.93E-07	2.39E-07	5.51E-08		
SITE LIMIT		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.51E-08		

THE FIVE-PERCENT-FOR-THE-ENTIRE-SITE X/Q IS LIMITING.

X/Q VALUES (SEC/CUBIC METER) FOR FUMIGATION AT THE BOUNDARY:

DOWNWIND SECTOR	DISTANCE (METERS)	FUMIGATION X/Q
S	375.	1.52E-04
SSW	375.	1.52E-04
SW	375.	1.52E-04
WSW	375.	1.52E-04
W	375.	1.54E-04
WNW	375.	1.55E-04
NW	375.	1.58E-04
NNW	375.	1.60E-04
N	375.	1.53E-04
NNE	375.	1.52E-04
NE	375.	1.52E-04
ENE	375.	1.52E-04
E	375.	1.52E-04
ESE	375.	1.52E-04
SE	375.	1.52E-04
SSE	375.	1.52E-04

NOTE: VALUES ON THIS PAGE ARE APPROXIMATIONS ONLY.
CHECK THE REASONABLENESS OF THE ENVELOPES
COMPUTED FOR THE 0-2 HOUR VALUES. FOR ANY
FAULTY ENVELOPES, ADJUST THE ABOVE VALUES.

USNRC COMPUTER CODE-PAVAN, VERSION 2.0 RUN DATE: 09/14/04

PLANT NAME: Quad Cities
DATA PERIOD:
TYPE OF RELEASE: Elevated Release
SOURCE OF DATA:
COMMENTS: QDC, Elevated Release, Control Room Intake, Station Chimney, Rev 1 met data
PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145

METEOROLOGICAL INSTRUMENTATION
WIND SENSORS HEIGHT: 90.2 meters
DELTA-T HEIGHTS: 10.1-90.2 meters

RELATIVE CONCENTRATION (X/Q) VALUES (SEC/CUBIC METER)
VERSUS
AVERAGING TIME

DOWNWIND SECTOR	DISTANCE (METERS)	0-2 HOURS	0-8 HOURS	8-24 HOURS	1-4 DAYS	4-30 DAYS	ANNUAL AVERAGE	HOURS PER YEAR MAX 0-2 HR X/Q IS EXCEEDED IN SECTOR	DOWNWIND SECTOR
S	425.	4.23E-06	1.73E-06	1.10E-06	4.18E-07	1.04E-07	1.89E-08	25.8	S
SSW	425.	3.98E-06	1.69E-06	1.10E-06	4.32E-07	1.13E-07	2.20E-08	20.6	SSW
SW	425.	4.09E-06	1.70E-06	1.10E-06	4.26E-07	1.09E-07	2.06E-08	22.6	SW
WSW	425.	4.15E-06	1.68E-06	1.07E-06	4.02E-07	9.83E-08	1.76E-08	26.1	WSW
W	425.	4.29E-06	1.58E-06	9.62E-07	3.27E-07	6.93E-08	1.04E-08	24.5	W
WNW	425.	4.23E-06	1.63E-06	1.01E-06	3.60E-07	8.17E-08	1.33E-08	25.4	WNW
NW	425.	4.41E-06	1.82E-06	1.17E-06	4.51E-07	1.14E-07	2.12E-08	27.5	NW
NNW	425.	4.86E-06	2.18E-06	1.46E-06	6.15E-07	1.77E-07	3.86E-08	36.3	NNW
N	425.	4.09E-06	1.78E-06	1.17E-06	4.75E-07	1.30E-07	2.65E-08	22.3	N
NNE	425.	5.00E-06	2.39E-06	1.65E-06	7.43E-07	2.35E-07	5.77E-08	39.0	NNE
NE	425.	4.86E-06	2.11E-06	1.39E-06	5.62E-07	1.53E-07	3.12E-08	37.5	NE
ENE	425.	4.76E-06	2.10E-06	1.40E-06	5.75E-07	1.61E-07	3.39E-08	35.6	ENE
E	425.	5.20E-06	2.39E-06	1.62E-06	6.94E-07	2.06E-07	4.67E-08	43.7	E
ESE	425.	5.08E-06	2.39E-06	1.64E-06	7.23E-07	2.23E-07	5.31E-08	41.4	ESE
SE	425.	5.06E-06	2.38E-06	1.63E-06	7.22E-07	2.23E-07	5.31E-08	40.6	SE
SSE	425.	4.66E-06	2.11E-06	1.42E-06	5.99E-07	1.74E-07	3.84E-08	31.7	SSE
MAX X/Q		5.20E-06				TOTAL HOURS AROUND SITE:		500.5	
SRP 2.3.4	425.	5.69E-06	2.66E-06	1.82E-06	8.00E-07	2.45E-07	5.77E-08		
SITE LIMIT		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.77E-08		

THE FIVE-PERCENT-FOR-THE-ENTIRE-SITE X/Q IS LIMITING.

X/Q VALUES (SEC/CUBIC METER) FOR FUMIGATION AT THE BOUNDARY:

DOWNWIND SECTOR	DISTANCE (METERS)	FUMIGATION X/Q
S	425.	1.36E-04
SSW	425.	1.36E-04
SW	425.	1.36E-04
WSW	425.	1.36E-04
W	425.	1.37E-04
WNW	425.	1.38E-04
NW	425.	1.41E-04
NNW	425.	1.43E-04
N	425.	1.36E-04
NNE	425.	1.36E-04
NE	425.	1.36E-04
ENE	425.	1.36E-04
E	425.	1.36E-04
ESE	425.	1.36E-04
SE	425.	1.36E-04
SSE	425.	1.36E-04

NOTE: VALUES ON THIS PAGE ARE APPROXIMATIONS ONLY.
CHECK THE REASONABLENESS OF THE ENVELOPES
COMPUTED FOR THE 0-2 HOUR VALUES. FOR ANY
FAULTY ENVELOPES, ADJUST THE ABOVE VALUES.

Station Chimney to Control Room Intake (450 and 1800 m)

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   1  1111
Quad Cities                                  Elevated Release
90.2 meters          10.1-90.2 meters

QDC, Elevated Release, Control Room Intake, Station Chimney, Rev 1 met data
    7    0
1564. 43.7 85.8 90.2
    0    0    0    0    0    0    0
   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.
   4.   5.   4.   8.   2.   1.   3.   6.   5.   9.  10.  20.  18.  29.  23.  12.
  33.  45.  30.  25.  12.   9.  28.  57.  28.  90.  49.  47.  78.  59.  72.  73.
  20.  23.  28.  11.   5.  11.  28.  62.  69. 120.  24.  32.  47.  87. 102.  60.
   1.   3.   4.   5.   0.   5.   9.  21.  29.  35.   5.   3.  11.  44.  37.   9.
   1.   0.   2.   2.   0.   1.   0.   4.   3.  16.   0.   0.   2.   6.   8.   0.
   0.   0.   0.   0.   1.   0.   1.   1.   0.   0.   0.   2.   1.   1.   2.   0.
  22.  21.  22.  29.  17.  20.  16.  23.  18.  42.  46.  37.  48.  42.  31.  31.
  46.  53.  54.  29.  24.  41.  44.  69.  45.  99.  57.  64.  70.  65.  72.  53.
  15.  15.  25.  11.  12.  18.  29.  39.  26.  64.  39.  34.  72.  65.  58.  57.
   6.   4.   2.  11.   5.  12.   6.   9.  11.  27.  14.   3.  26.  32.  25.   5.
   0.   1.   1.   3.   0.   2.   1.   3.   3.   6.   4.   1.   7.  11.   8.   2.
   0.   0.   0.   0.   0.   2.   1.   1.   0.   4.   3.   4.   4.   3.   1.   1.
  42.  28.  34.  33.  38.  28.  30.  42.  30.  64.  65.  40.  56.  63.  65.  53.
  43.  54.  50.  31.  37.  39.  53.  69.  41.  93.  49.  60.  76.  69.  59.  61.
  23.  15.  33.  26.  20.  34.  33.  37.  32.  50.  43.  49.  78.  73.  76.  40.
   9.   6.   5.  13.   9.  12.   7.  12.  12.  28.  12.  12.  38.  47.  29.   9.
   1.   1.   0.   4.   2.   5.   0.   0.   5.  16.   3.   1.  17.  22.   8.   3.
  36.  19.  25.  30.  29.  31.  29.  34.  26.  29.  38.  28.  41.  29.  36.  24.
 157. 128. 156. 170. 268. 186. 167. 153. 135. 180. 173. 174. 196. 172. 227. 175.
 295. 260. 334. 351. 391. 296. 229. 264. 182. 208. 246. 275. 340. 519. 505. 308.
 337. 258. 353. 384. 330. 225. 251. 204. 236. 274. 244. 291. 578. 914. 678. 329.
  73. 107. 215. 234.  99. 152. 103.  98. 116. 164. 131. 112. 338. 485. 325. 109.
  25.  26.  71.  78.  16.  62.  43.  59.  71.  64.  51.  48. 233. 307. 113.  19.
  20.  14.   5.  17.  23.  22.  12.   5.  18.  12.  15.  16.   6.   5.  13.  16.
  77.  75.  88.  88. 149.  76.  78.  78.  69.  76.  81.  59.  67.  70.  74.  90.
 187. 159. 169. 182. 255. 211. 198. 219. 205. 264. 201. 168. 208. 204. 236. 247.
 209. 131. 158. 194. 162. 282. 301. 329. 408. 468. 438. 287. 348. 397. 308. 243.
  13.   8.  27.  46.  20.  89.  95. 145. 237. 310. 173.  49.  69.  51.  25.  10.
   1.   0.   4.   6.   4.  24.  14.  61.  85.  99.  24.   5.   4.   3.   0.   1.
  14.  19.  13.  17.  12.   6.   7.   9.  11.   9.   8.  14.  13.  15.   8.   8.
  46.  48.  52.  62.  72.  57.  46.  50.  46.  22.  48.  33.  45.  20.  41.  52.
 104.  75.  99.  80.  95. 113. 122. 205. 166. 179. 104.  72.  61.  60.  80. 108.
  54.  38.  47.  44.  40. 154. 234. 243. 255. 259.  92.  45.  63.  78.  57.  50.
   1.   0.   3.   2.   0.  26.  38.  29.  28.  31.  15.   2.   3.   7.   2.   2.
   0.   0.   0.   0.   0.   0.   0.   0.   0.   2.   0.   0.   0.   0.   0.   0.
  10.  11.   9.  14.  14.  10.   7.  11.   8.  11.   5.   1.   9.   7.   2.   8.
  23.  27.  26.  31.  24.  33.  45.  20.  39.  40.  44.  26.  28.  15.  12.  23.
  30.  23.  29.  28.  24.  48.  76.  99.  89.  88.  64.  23.  39.  27.  25.  16.
  15.  10.  10.   0.   5.  22.  74. 115.  91. 119.  30.   8.   9.  12.   9.  13.
   1.   0.   0.   0.   1.   6.  12.   6.   3.   6.   1.   1.   0.   1.   0.   0.
   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.
 101. 0.75 3.50 7.50 12.5 18.5 24.0 55.0
 450. 450. 450. 450. 450. 450. 450. 450. 450. 450. 450. 450. 450. 450. 450. 450.
1800.1800.1800.1800.1800.1800.1800.1800.1800.1800.1800.1800.1800.1800.1800.1800.
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1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1.
1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1.

USNRC COMPUTER CODE-PAVAN, VERSION 2.0 RUN DATE: 09/14/04

PRINTOUT OF INPUT CARDS

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   1     00010 01111 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000   2     Quad Cities
Elevated Release
   3     90.2 meters        10.1-90.2 meters
   4
   5     QDC, Elevated Release, Control Room Intake, Station Chimney, Rev 1 met data        6          7 42727     0
   7          0.500  1564.000    43.700    85.800    90.200
   8       0.000  0.000  0.000  0.000  0.000  0.000  0.000
   9       0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000
   9       4.000  5.000  4.000  8.000  2.000  1.000  3.000  6.000  5.000  9.000 10.000 20.000 18.000 29.000 23.000 12.000
   9      33.000 45.000 30.000 25.000 12.000  9.000 28.000 57.000 28.000 90.000 49.000 47.000 78.000 59.000 72.000 73.000
   9      20.000 23.000 28.000 11.000  5.000 11.000 28.000 62.000 69.000120.000 24.000 32.000 47.000 87.000102.000 60.000
   9       1.000  3.000  4.000  5.000  0.000  5.000  9.000 21.000 29.000 35.000  5.000  3.000 11.000 44.000 37.000  9.000
   9       1.000  0.000  2.000  2.000  0.000  1.000  0.000  4.000  3.000 16.000  0.000  0.000  2.000  6.000  8.000  0.000
   9       0.000  0.000  0.000  0.000  1.000  0.000  1.000  1.000  0.000  0.000  0.000  2.000  1.000  1.000  2.000  0.000
   9      22.000 21.000 22.000 29.000 17.000 20.000 16.000 23.000 18.000 42.000 46.000 37.000 48.000 42.000 31.000 31.000
   9      46.000 53.000 54.000 29.000 24.000 41.000 44.000 69.000 45.000 99.000 57.000 64.000 70.000 65.000 72.000 53.000
   9      15.000 15.000 25.000 11.000 12.000 18.000 29.000 39.000 26.000 64.000 39.000 34.000 72.000 65.000 58.000 57.000
   9       6.000  4.000  2.000 11.000  5.000 12.000  6.000  9.000 11.000 27.000 14.000  3.000 26.000 32.000 25.000  5.000
   9       0.000  1.000  1.000  3.000  0.000  2.000  1.000  3.000  3.000  6.000  4.000  1.000  7.000 11.000  8.000  2.000
   9       0.000  0.000  0.000  0.000  0.000  2.000  1.000  1.000  0.000  4.000  3.000  4.000  4.000  3.000  1.000  1.000
   9      42.000 28.000 34.000 33.000 38.000 28.000 30.000 42.000 30.000 64.000 65.000 40.000 56.000 63.000 65.000 53.000
   9      43.000 54.000 50.000 31.000 37.000 39.000 53.000 69.000 41.000 93.000 49.000 60.000 76.000 69.000 59.000 61.000
   9      23.000 15.000 33.000 26.000 20.000 34.000 33.000 37.000 32.000 50.000 43.000 49.000 78.000 73.000 76.000 40.000
   9       9.000  6.000  5.000 13.000  9.000 12.000  7.000 12.000 12.000 28.000 12.000 12.000 38.000 47.000 29.000  9.000
   9       1.000  1.000  0.000  4.000  2.000  5.000  0.000  0.000  5.000 16.000  3.000  1.000 17.000 22.000  8.000  3.000
   9      36.000 19.000 25.000 30.000 29.000 31.000 29.000 34.000 26.000 29.000 38.000 28.000 41.000 29.000 36.000 24.000
   9     157.000128.000156.000170.000268.000186.000167.000153.000135.000180.000173.000174.000196.000172.000227.000175.000
   9     295.000260.000334.000351.000391.000296.000229.000264.000182.000208.000246.000275.000340.000519.000505.000308.000
   9     337.000258.000353.000384.000330.000225.000251.000204.000236.000274.000244.000291.000578.000914.000678.000329.000
   9      73.000107.000215.000234.000 99.000152.000103.000 98.000116.000164.000131.000112.000338.000485.000325.000109.000
   9      25.000 26.000 71.000 78.000 16.000 62.000 43.000 59.000 71.000 64.000 51.000 48.000233.000307.000113.000 19.000
   9      20.000 14.000  5.000 17.000 23.000 22.000 12.000  5.000 18.000 12.000 15.000 16.000  6.000  5.000 13.000 16.000
   9      77.000 75.000 88.000 88.000149.000 76.000 78.000 78.000 69.000 76.000 81.000 59.000 67.000 70.000 74.000 90.000
   9     187.000159.000169.000182.000255.000211.000198.000219.000205.000264.000201.000168.000208.000204.000236.000247.000
   9     209.000131.000158.000194.000162.000282.000301.000329.000408.000468.000438.000287.000348.000397.000308.000243.000
   9      13.000  8.000 27.000 46.000 20.000 89.000 95.000145.000237.000310.000173.000 49.000 69.000 51.000 25.000 10.000
   9       1.000  0.000  4.000  6.000  4.000 24.000 14.000 61.000 85.000 99.000 24.000  5.000  4.000  3.000  0.000  1.000
   9      14.000 19.000 13.000 17.000 12.000  6.000  7.000  9.000 11.000  9.000  8.000 14.000 13.000 15.000  8.000  8.000
   9      46.000 48.000 52.000 62.000 72.000 57.000 46.000 50.000 46.000 22.000 48.000 33.000 45.000 20.000 41.000 52.000
   9     104.000 75.000 99.000 80.000 95.000113.000122.000205.000166.000179.000104.000 72.000 61.000 60.000 80.000108.000
   9      54.000 38.000 47.000 44.000 40.000154.000234.000243.000255.000259.000 92.000 45.000 63.000 78.000 57.000 50.000
   9       1.000  0.000  3.000  2.000  0.000 26.000 38.000 29.000 28.000 31.000 15.000  2.000  3.000  7.000  2.000  2.000
   9       0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  2.000  0.000  0.000  0.000  0.000  0.000  0.000
   9      10.000 11.000  9.000 14.000 14.000 10.000  7.000 11.000  8.000 11.000  5.000  1.000  9.000  7.000  2.000  8.000
   9      23.000 27.000 26.000 31.000 24.000 33.000 45.000 20.000 39.000 40.000 44.000 26.000 28.000 15.000 12.000 23.000
   9      30.000 23.000 29.000 28.000 24.000 48.000 76.000 99.000 89.000 88.000 64.000 23.000 39.000 27.000 25.000 16.000
   9      15.000 10.000 10.000  0.000  5.000 22.000 74.000115.000 91.000119.000 30.000  8.000  9.000 12.000  9.000 13.000
   9       1.000  0.000  0.000  0.000  1.000  6.000 12.000  6.000  3.000  6.000  1.000  1.000  0.000  1.000  0.000  0.000
   9       0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  10        101.  0.750  3.500
7.500 12.500 18.500 24.000 55.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  11        450.   450.   450.   450.   450.   450.   450.   450.   450.
450.   450.   450.   450.   450.   450.   450.  11        1800.  1800.  1800.  1800.  1800.  1800.  1800.  1800.  1800.  1800.  1800.  1800.  1800.
1800.  1800.  12         1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0
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12	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0

USNRC COMPUTER CODE-PAVAN, VERSION 2.0 RUN DATE: 09/14/04

PLANT NAME: Quad Cities
DATA PERIOD:
TYPE OF RELEASE: Elevated Release
SOURCE OF DATA:
COMMENTS: QDC, Elevated Release, Control Room Intake, Station Chimney, Rev 1 met data
PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145

METEOROLOGICAL INSTRUMENTATION
WIND SENSORS HEIGHT: 90.2 meters
DELTA-T HEIGHTS: 10.1-90.2 meters

RELATIVE CONCENTRATION (X/Q) VALUES (SEC/CUBIC METER)
VERSUS
AVERAGING TIME

DOWNWIND SECTOR	DISTANCE (METERS)	0-2 HOURS	0-8 HOURS	8-24 HOURS	1-4 DAYS	4-30 DAYS	ANNUAL AVERAGE	HOURS PER YEAR MAX 0-2 HR X/Q IS EXCEEDED IN SECTOR	DOWNWIND SECTOR
S	450.	4.20E-06	1.73E-06	1.11E-06	4.23E-07	1.06E-07	1.95E-08	26.2	S
SSW	450.	3.95E-06	1.68E-06	1.10E-06	4.33E-07	1.14E-07	2.24E-08	20.9	SSW
SW	450.	4.04E-06	1.70E-06	1.10E-06	4.29E-07	1.11E-07	2.13E-08	22.8	SW
WSW	450.	4.15E-06	1.69E-06	1.08E-06	4.07E-07	1.01E-07	1.82E-08	26.6	WSW
W	450.	4.29E-06	1.60E-06	9.81E-07	3.38E-07	7.31E-08	1.12E-08	25.2	W
WNW	450.	4.23E-06	1.65E-06	1.03E-06	3.73E-07	8.62E-08	1.44E-08	26.0	WNW
NW	450.	4.41E-06	1.83E-06	1.18E-06	4.57E-07	1.16E-07	2.19E-08	28.2	NW
NNW	450.	4.86E-06	2.19E-06	1.47E-06	6.17E-07	1.78E-07	3.89E-08	37.2	NNW
N	450.	3.92E-06	1.72E-06	1.14E-06	4.64E-07	1.28E-07	2.65E-08	21.6	N
NNE	450.	4.89E-06	2.35E-06	1.63E-06	7.35E-07	2.35E-07	5.80E-08	37.8	NNE
NE	450.	4.85E-06	2.12E-06	1.40E-06	5.70E-07	1.57E-07	3.24E-08	38.1	NE
ENE	450.	4.72E-06	2.10E-06	1.40E-06	5.78E-07	1.63E-07	3.46E-08	35.8	ENE
E	450.	5.16E-06	2.38E-06	1.61E-06	6.97E-07	2.09E-07	4.77E-08	43.7	E
ESE	450.	4.96E-06	2.35E-06	1.61E-06	7.15E-07	2.23E-07	5.33E-08	40.2	ESE
SE	450.	4.95E-06	2.34E-06	1.61E-06	7.12E-07	2.21E-07	5.30E-08	39.4	SE
SSE	450.	4.50E-06	2.05E-06	1.38E-06	5.89E-07	1.73E-07	3.86E-08	30.3	SSE
MAX X/Q		5.16E-06				TOTAL HOURS AROUND SITE:		499.9	
SRP 2.3.4	450.	5.69E-06	2.67E-06	1.83E-06	8.02E-07	2.46E-07	5.80E-08		
SITE LIMIT		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.80E-08		

THE FIVE-PERCENT-FOR-THE-ENTIRE-SITE X/Q IS LIMITING.

X/Q VALUES (SEC/CUBIC METER) FOR FUMIGATION AT THE BOUNDARY:

DOWNWIND SECTOR	DISTANCE (METERS)	FUMIGATION X/Q
S	450.	1.29E-04
SSW	450.	1.29E-04
SW	450.	1.29E-04
WSW	450.	1.29E-04
W	450.	1.30E-04
WNW	450.	1.31E-04
NW	450.	1.34E-04
NNW	450.	1.36E-04
N	450.	1.29E-04
NNE	450.	1.29E-04
NE	450.	1.29E-04
ENE	450.	1.29E-04
E	450.	1.29E-04
ESE	450.	1.29E-04
SE	450.	1.29E-04
SSE	450.	1.29E-04

NOTE: VALUES ON THIS PAGE ARE APPROXIMATIONS ONLY.
CHECK THE REASONABLENESS OF THE ENVELOPES
COMPUTED FOR THE 0-2 HOUR VALUES. FOR ANY
FAULTY ENVELOPES, ADJUST THE ABOVE VALUES.

USNRC COMPUTER CODE-PAVAN, VERSION 2.0 RUN DATE: 09/14/04

PLANT NAME: Quad Cities
DATA PERIOD:
TYPE OF RELEASE: Elevated Release
SOURCE OF DATA:
COMMENTS: QDC, Elevated Release, Control Room Intake, Station Chimney, Rev 1 met data
PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145

METEOROLOGICAL INSTRUMENTATION
WIND SENSORS HEIGHT: 90.2 meters
DELTA-T HEIGHTS: 10.1-90.2 meters

RELATIVE CONCENTRATION (X/Q) VALUES (SEC/CUBIC METER)
VERSUS
AVERAGING TIME

DOWNWIND SECTOR	DISTANCE (METERS)	0-2 HOURS	0-8 HOURS	8-24 HOURS	1-4 DAYS	4-30 DAYS	ANNUAL AVERAGE	HOURS PER YEAR MAX 0-2 HR X/Q IS EXCEEDED IN SECTOR	DOWNWIND SECTOR
S	1800.	3.46E-06	1.63E-06	1.12E-06	4.93E-07	1.52E-07	3.62E-08	32.8	S
SSW	1800.	3.05E-06	1.42E-06	9.69E-07	4.23E-07	1.29E-07	3.00E-08	22.5	SSW
SW	1800.	3.24E-06	1.55E-06	1.08E-06	4.84E-07	1.54E-07	3.78E-08	26.9	SW
WSW	1800.	3.41E-06	1.63E-06	1.13E-06	5.07E-07	1.61E-07	3.93E-08	31.0	WSW
W	1800.	3.90E-06	1.85E-06	1.28E-06	5.69E-07	1.79E-07	4.33E-08	43.7	W
WNW	1800.	3.68E-06	1.73E-06	1.19E-06	5.22E-07	1.61E-07	3.81E-08	37.8	WNW
NW	1800.	3.72E-06	1.74E-06	1.19E-06	5.22E-07	1.60E-07	3.76E-08	38.9	NW
NNW	1800.	3.82E-06	1.81E-06	1.25E-06	5.59E-07	1.76E-07	4.26E-08	41.7	NNW
N	1800.	3.18E-06	1.49E-06	1.01E-06	4.44E-07	1.35E-07	3.17E-08	26.3	N
NNE	1800.	3.60E-06	1.76E-06	1.23E-06	5.62E-07	1.84E-07	4.67E-08	35.5	NNE
NE	1800.	3.67E-06	1.75E-06	1.21E-06	5.42E-07	1.71E-07	4.19E-08	37.7	NE
ENE	1800.	3.49E-06	1.66E-06	1.15E-06	5.14E-07	1.62E-07	3.95E-08	32.8	ENE
E	1800.	3.73E-06	1.87E-06	1.32E-06	6.26E-07	2.13E-07	5.72E-08	39.6	E
ESE	1800.	3.57E-06	1.85E-06	1.33E-06	6.51E-07	2.33E-07	6.66E-08	34.6	ESE
SE	1800.	3.83E-06	1.93E-06	1.37E-06	6.55E-07	2.26E-07	6.13E-08	41.8	SE
SSE	1800.	3.48E-06	1.67E-06	1.16E-06	5.20E-07	1.65E-07	4.07E-08	31.6	SSE
MAX X/Q		3.90E-06				TOTAL HOURS AROUND SITE:		555.3	
SRP 2.3.4	1800.	4.53E-06	2.25E-06	1.59E-06	7.46E-07	2.52E-07	6.66E-08		
SITE LIMIT		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.66E-08		

THE FIVE-PERCENT-FOR-THE-ENTIRE-SITE X/Q IS LIMITING.

X/Q VALUES (SEC/CUBIC METER) FOR FUMIGATION AT THE BOUNDARY:

DOWNWIND SECTOR	DISTANCE (METERS)	FUMIGATION X/Q
S	1800.	3.70E-05
SSW	1800.	3.70E-05
SW	1800.	3.70E-05
WSW	1800.	3.70E-05
W	1800.	3.73E-05
WNW	1800.	3.76E-05
NW	1800.	3.84E-05
NNW	1800.	3.88E-05
N	1800.	3.70E-05
NNE	1800.	3.70E-05
NE	1800.	3.70E-05
ENE	1800.	3.70E-05
E	1800.	3.70E-05
ESE	1800.	3.70E-05
SE	1800.	3.70E-05
SSE	1800.	3.70E-05

NOTE: VALUES ON THIS PAGE ARE APPROXIMATIONS ONLY.
CHECK THE REASONABLENESS OF THE ENVELOPES
COMPUTED FOR THE 0-2 HOUR VALUES. FOR ANY
FAULTY ENVELOPES, ADJUST THE ABOVE VALUES.

Station Chimney to Control Room Intake (1900 and 2200 m)

```
   1  1111
Quad Cities                                  Elevated Release
90.2 meters          10.1-90.2 meters

QDC, Elevated Release, Control Room Intake, Station Chimney, Rev 1 met data
    7    0
1564. 43.7 85.8 90.2
    0    0    0    0    0    0    0
   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.
   4.   5.   4.   8.   2.   1.   3.   6.   5.   9.  10.  20.  18.  29.  23.  12.
  33.  45.  30.  25.  12.   9.  28.  57.  28.  90.  49.  47.  78.  59.  72.  73.
  20.  23.  28.  11.   5.  11.  28.  62.  69. 120.  24.  32.  47.  87. 102.  60.
   1.   3.   4.   5.   0.   5.   9.  21.  29.  35.   5.   3.  11.  44.  37.   9.
   1.   0.   2.   2.   0.   1.   0.   4.   3.  16.   0.   0.   2.   6.   8.   0.
   0.   0.   0.   0.   1.   0.   1.   1.   0.   0.   0.   2.   1.   1.   2.   0.
  22.  21.  22.  29.  17.  20.  16.  23.  18.  42.  46.  37.  48.  42.  31.  31.
  46.  53.  54.  29.  24.  41.  44.  69.  45.  99.  57.  64.  70.  65.  72.  53.
  15.  15.  25.  11.  12.  18.  29.  39.  26.  64.  39.  34.  72.  65.  58.  57.
   6.   4.   2.  11.   5.  12.   6.   9.  11.  27.  14.   3.  26.  32.  25.   5.
   0.   1.   1.   3.   0.   2.   1.   3.   3.   6.   4.   1.   7.  11.   8.   2.
   0.   0.   0.   0.   0.   2.   1.   1.   0.   4.   3.   4.   4.   3.   1.   1.
  42.  28.  34.  33.  38.  28.  30.  42.  30.  64.  65.  40.  56.  63.  65.  53.
  43.  54.  50.  31.  37.  39.  53.  69.  41.  93.  49.  60.  76.  69.  59.  61.
  23.  15.  33.  26.  20.  34.  33.  37.  32.  50.  43.  49.  78.  73.  76.  40.
   9.   6.   5.  13.   9.  12.   7.  12.  12.  28.  12.  12.  38.  47.  29.   9.
   1.   1.   0.   4.   2.   5.   0.   0.   5.  16.   3.   1.  17.  22.   8.   3.
  36.  19.  25.  30.  29.  31.  29.  34.  26.  29.  38.  28.  41.  29.  36.  24.
 157. 128. 156. 170. 268. 186. 167. 153. 135. 180. 173. 174. 196. 172. 227. 175.
 295. 260. 334. 351. 391. 296. 229. 264. 182. 208. 246. 275. 340. 519. 505. 308.
 337. 258. 353. 384. 330. 225. 251. 204. 236. 274. 244. 291. 578. 914. 678. 329.
  73. 107. 215. 234.  99. 152. 103.  98. 116. 164. 131. 112. 338. 485. 325. 109.
  25.  26.  71.  78.  16.  62.  43.  59.  71.  64.  51.  48. 233. 307. 113.  19.
  20.  14.   5.  17.  23.  22.  12.   5.  18.  12.  15.  16.   6.   5.  13.  16.
  77.  75.  88.  88. 149.  76.  78.  78.  69.  76.  81.  59.  67.  70.  74.  90.
 187. 159. 169. 182. 255. 211. 198. 219. 205. 264. 201. 168. 208. 204. 236. 247.
 209. 131. 158. 194. 162. 282. 301. 329. 408. 468. 438. 287. 348. 397. 308. 243.
  13.   8.  27.  46.  20.  89.  95. 145. 237. 310. 173.  49.  69.  51.  25.  10.
   1.   0.   4.   6.   4.  24.  14.  61.  85.  99.  24.   5.   4.   3.   0.   1.
  14.  19.  13.  17.  12.   6.   7.   9.  11.   9.   8.  14.  13.  15.   8.   8.
  46.  48.  52.  62.  72.  57.  46.  50.  46.  22.  48.  33.  45.  20.  41.  52.
 104.  75.  99.  80.  95. 113. 122. 205. 166. 179. 104.  72.  61.  60.  80. 108.
  54.  38.  47.  44.  40. 154. 234. 243. 255. 259.  92.  45.  63.  78.  57.  50.
   1.   0.   3.   2.   0.  26.  38.  29.  28.  31.  15.   2.   3.   7.   2.   2.
   0.   0.   0.   0.   0.   0.   0.   0.   0.   2.   0.   0.   0.   0.   0.   0.
  10.  11.   9.  14.  14.  10.   7.  11.   8.  11.   5.   1.   9.   7.   2.   8.
  23.  27.  26.  31.  24.  33.  45.  20.  39.  40.  44.  26.  28.  15.  12.  23.
  30.  23.  29.  28.  24.  48.  76.  99.  89.  88.  64.  23.  39.  27.  25.  16.
  15.  10.  10.   0.   5.  22.  74. 115.  91. 119.  30.   8.   9.  12.   9.  13.
   1.   0.   0.   0.   1.   6.  12.   6.   3.   6.   1.   1.   0.   1.   0.   0.
   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.
 101. 0.75 3.50 7.50 12.5 18.5 24.0 55.0
1900.1900.1900.1900.1900.1900.1900.1900.1900.1900.1900.1900.1900.1900.1900.1900.
2200.2200.2200.2200.2200.2200.2200.2200.2200.2200.2200.2200.2200.2200.2200.2200.
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1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1.
1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1.

USNRC COMPUTER CODE-PAVAN, VERSION 2.0 RUN DATE: 09/14/04

PRINTOUT OF INPUT CARDS

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  1     00010 01111 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000   2     Quad Cities
Elevated Release
  3     90.2 meters          10.1-90.2 meters
  4
  5     QDC, Elevated Release, Control Room Intake, Station Chimney, Rev 1 met data        6          7 42727     0
  7          0.500  1564.000    43.700    85.800    90.200
  8       0.000  0.000  0.000  0.000  0.000  0.000  0.000
  9       0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000
  9       4.000  5.000  4.000  8.000  2.000  1.000  3.000  6.000  5.000  9.000 10.000 20.000 18.000 29.000 23.000 12.000
  9      33.000 45.000 30.000 25.000 12.000  9.000 28.000 57.000 28.000 90.000 49.000 47.000 78.000 59.000 72.000 73.000
  9      20.000 23.000 28.000 11.000  5.000 11.000 28.000 62.000 69.000120.000 24.000 32.000 47.000 87.000102.000 60.000
  9       1.000  3.000  4.000  5.000  0.000  5.000  9.000 21.000 29.000 35.000  5.000  3.000 11.000 44.000 37.000  9.000
  9       1.000  0.000  2.000  2.000  0.000  1.000  0.000  4.000  3.000 16.000  0.000  0.000  2.000  6.000  8.000  0.000
  9       0.000  0.000  0.000  0.000  1.000  0.000  1.000  1.000  0.000  0.000  0.000  2.000  1.000  1.000  2.000  0.000
  9      22.000 21.000 22.000 29.000 17.000 20.000 16.000 23.000 18.000 42.000 46.000 37.000 48.000 42.000 31.000 31.000
  9      46.000 53.000 54.000 29.000 24.000 41.000 44.000 69.000 45.000 99.000 57.000 64.000 70.000 65.000 72.000 53.000
  9      15.000 15.000 25.000 11.000 12.000 18.000 29.000 39.000 26.000 64.000 39.000 34.000 72.000 65.000 58.000 57.000
  9       6.000  4.000  2.000 11.000  5.000 12.000  6.000  9.000 11.000 27.000 14.000  3.000 26.000 32.000 25.000  5.000
  9       0.000  1.000  1.000  3.000  0.000  2.000  1.000  3.000  3.000  6.000  4.000  1.000  7.000 11.000  8.000  2.000
  9       0.000  0.000  0.000  0.000  0.000  2.000  1.000  1.000  0.000  4.000  3.000  4.000  4.000  3.000  1.000  1.000
  9      42.000 28.000 34.000 33.000 38.000 28.000 30.000 42.000 30.000 64.000 65.000 40.000 56.000 63.000 65.000 53.000
  9      43.000 54.000 50.000 31.000 37.000 39.000 53.000 69.000 41.000 93.000 49.000 60.000 76.000 69.000 59.000 61.000
  9      23.000 15.000 33.000 26.000 20.000 34.000 33.000 37.000 32.000 50.000 43.000 49.000 78.000 73.000 76.000 40.000
  9       9.000  6.000  5.000 13.000  9.000 12.000  7.000 12.000 12.000 28.000 12.000 12.000 38.000 47.000 29.000  9.000
  9       1.000  1.000  0.000  4.000  2.000  5.000  0.000  0.000  5.000 16.000  3.000  1.000 17.000 22.000  8.000  3.000
  9      36.000 19.000 25.000 30.000 29.000 31.000 29.000 34.000 26.000 29.000 38.000 28.000 41.000 29.000 36.000 24.000
  9     157.000128.000156.000170.000268.000186.000167.000153.000135.000180.000173.000174.000196.000172.000227.000175.000
  9     295.000260.000334.000351.000391.000296.000229.000264.000182.000208.000246.000275.000340.000519.000505.000308.000
  9     337.000258.000353.000384.000330.000225.000251.000204.000236.000274.000244.000291.000578.000914.000678.000329.000
  9      73.000107.000215.000234.000 99.000152.000103.000 98.000116.000164.000131.000112.000338.000485.000325.000109.000
  9      25.000 26.000 71.000 78.000 16.000 62.000 43.000 59.000 71.000 64.000 51.000 48.000233.000307.000113.000 19.000
  9      20.000 14.000  5.000 17.000 23.000 22.000 12.000  5.000 18.000 12.000 15.000 16.000  6.000  5.000 13.000 16.000
  9      77.000 75.000 88.000 88.000149.000 76.000 78.000 78.000 69.000 76.000 81.000 59.000 67.000 70.000 74.000 90.000
  9     187.000159.000169.000182.000255.000211.000198.000219.000205.000264.000201.000168.000208.000204.000236.000247.000
  9     209.000131.000158.000194.000162.000282.000301.000329.000408.000468.000438.000287.000348.000397.000308.000243.000
  9      13.000  8.000 27.000 46.000 20.000 89.000 95.000145.000237.000310.000173.000 49.000 69.000 51.000 25.000 10.000
  9       1.000  0.000  4.000  6.000  4.000 24.000 14.000 61.000 85.000 99.000 24.000  5.000  4.000  3.000  0.000  1.000
  9      14.000 19.000 13.000 17.000 12.000  6.000  7.000  9.000 11.000  9.000  8.000 14.000 13.000 15.000  8.000  8.000
  9      46.000 48.000 52.000 62.000 72.000 57.000 46.000 50.000 46.000 22.000 48.000 33.000 45.000 20.000 41.000 52.000
  9     104.000 75.000 99.000 80.000 95.000113.000122.000205.000166.000179.000104.000 72.000 61.000 60.000 80.000108.000
  9      54.000 38.000 47.000 44.000 40.000154.000234.000243.000255.000259.000 92.000 45.000 63.000 78.000 57.000 50.000
  9       1.000  0.000  3.000  2.000  0.000 26.000 38.000 29.000 28.000 31.000 15.000  2.000  3.000  7.000  2.000  2.000
  9       0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  2.000  0.000  0.000  0.000  0.000  0.000  0.000
  9      10.000 11.000  9.000 14.000 14.000 10.000  7.000 11.000  8.000 11.000  5.000  1.000  9.000  7.000  2.000  8.000
  9      23.000 27.000 26.000 31.000 24.000 33.000 45.000 20.000 39.000 40.000 44.000 26.000 28.000 15.000 12.000 23.000
  9      30.000 23.000 29.000 28.000 24.000 48.000 76.000 99.000 89.000 88.000 64.000 23.000 39.000 27.000 25.000 16.000
  9      15.000 10.000 10.000  0.000  5.000 22.000 74.000115.000 91.000119.000 30.000  8.000  9.000 12.000  9.000 13.000
  9       1.000  0.000  0.000  0.000  1.000  6.000 12.000  6.000  3.000  6.000  1.000  1.000  0.000  1.000  0.000  0.000
  9       0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  10        101.  0.750  3.500
7.500 12.500 18.500 24.000 55.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  11       1900.  1900.  1900.  1900.  1900.  1900.  1900.  1900.  1900.
1900.  1900.  1900.  1900.  1900.  1900.  1900.  11       2200.  2200.  2200.  2200.  2200.  2200.  2200.  2200.  2200.  2200.  2200.  2200.  2200.
2200.  2200.  12         1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0
```

12	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0

USNRC COMPUTER CODE-PAVAN, VERSION 2.0 RUN DATE: 09/14/04

PLANT NAME: Quad Cities
DATA PERIOD:
TYPE OF RELEASE: Elevated Release
SOURCE OF DATA:
COMMENTS: QDC, Elevated Release, Control Room Intake, Station Chimney, Rev 1 met data
PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145

METEOROLOGICAL INSTRUMENTATION
WIND SENSORS HEIGHT: 90.2 meters
DELTA-T HEIGHTS: 10.1-90.2 meters

RELATIVE CONCENTRATION (X/Q) VALUES (SEC/CUBIC METER)
VERSUS
AVERAGING TIME

DOWNWIND SECTOR	DISTANCE (METERS)	0-2 HOURS	0-8 HOURS	8-24 HOURS	1-4 DAYS	4-30 DAYS	ANNUAL AVERAGE	HOURS PER YEAR MAX 0-2 HR X/Q IS EXCEEDED IN SECTOR	DOWNWIND SECTOR
S	1900.	3.46E-06	1.63E-06	1.12E-06	4.95E-07	1.53E-07	3.66E-08	32.8	S
SSW	1900.	3.05E-06	1.42E-06	9.71E-07	4.25E-07	1.29E-07	3.03E-08	22.5	SSW
SW	1900.	3.24E-06	1.56E-06	1.08E-06	4.85E-07	1.55E-07	3.81E-08	26.9	SW
WSW	1900.	3.41E-06	1.64E-06	1.13E-06	5.10E-07	1.62E-07	3.99E-08	31.0	WSW
W	1900.	3.90E-06	1.86E-06	1.28E-06	5.74E-07	1.81E-07	4.41E-08	43.7	W
WNW	1900.	3.68E-06	1.73E-06	1.19E-06	5.25E-07	1.62E-07	3.86E-08	37.8	WNW
NW	1900.	3.62E-06	1.70E-06	1.17E-06	5.16E-07	1.59E-07	3.79E-08	36.6	NW
NNW	1900.	3.63E-06	1.74E-06	1.21E-06	5.44E-07	1.73E-07	4.27E-08	37.4	NNW
N	1900.	3.18E-06	1.49E-06	1.02E-06	4.47E-07	1.37E-07	3.22E-08	26.3	N
NNE	1900.	3.60E-06	1.76E-06	1.23E-06	5.62E-07	1.83E-07	4.66E-08	35.5	NNE
NE	1900.	3.67E-06	1.75E-06	1.21E-06	5.43E-07	1.72E-07	4.20E-08	37.7	NE
ENE	1900.	3.49E-06	1.66E-06	1.15E-06	5.14E-07	1.62E-07	3.96E-08	32.8	ENE
E	1900.	3.73E-06	1.87E-06	1.32E-06	6.26E-07	2.13E-07	5.72E-08	39.6	E
ESE	1900.	3.57E-06	1.85E-06	1.33E-06	6.52E-07	2.34E-07	6.68E-08	34.6	ESE
SE	1900.	3.83E-06	1.94E-06	1.38E-06	6.56E-07	2.26E-07	6.16E-08	41.8	SE
SSE	1900.	3.48E-06	1.67E-06	1.16E-06	5.21E-07	1.66E-07	4.09E-08	31.6	SSE
MAX X/Q		3.90E-06				TOTAL HOURS AROUND SITE:		548.7	
SRP 2.3.4	1900.	4.53E-06	2.26E-06	1.59E-06	7.47E-07	2.52E-07	6.68E-08		
SITE LIMIT		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.68E-08		

THE FIVE-PERCENT-FOR-THE-ENTIRE-SITE X/Q IS LIMITING.

X/Q VALUES (SEC/CUBIC METER) FOR FUMIGATION AT THE BOUNDARY:

DOWNWIND SECTOR	DISTANCE (METERS)	FUMIGATION X/Q
S	1900.	3.52E-05
SSW	1900.	3.52E-05
SW	1900.	3.52E-05
WSW	1900.	3.52E-05
W	1900.	3.55E-05
WNW	1900.	3.58E-05
NW	1900.	3.65E-05
NNW	1900.	3.69E-05
N	1900.	3.53E-05
NNE	1900.	3.52E-05
NE	1900.	3.52E-05
ENE	1900.	3.52E-05
E	1900.	3.52E-05
ESE	1900.	3.52E-05
SE	1900.	3.52E-05
SSE	1900.	3.52E-05

NOTE: VALUES ON THIS PAGE ARE APPROXIMATIONS ONLY.
CHECK THE REASONABLENESS OF THE ENVELOPES
COMPUTED FOR THE 0-2 HOUR VALUES. FOR ANY
FAULTY ENVELOPES, ADJUST THE ABOVE VALUES.

USNRC COMPUTER CODE-PAVAN, VERSION 2.0 RUN DATE: 09/14/04

PLANT NAME: Quad Cities
DATA PERIOD:
TYPE OF RELEASE: Elevated Release
SOURCE OF DATA:
COMMENTS: QDC, Elevated Release, Control Room Intake, Station Chimney, Rev 1 met data
PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145

METEOROLOGICAL INSTRUMENTATION
WIND SENSORS HEIGHT: 90.2 meters
DELTA-T HEIGHTS: 10.1-90.2 meters

RELATIVE CONCENTRATION (X/Q) VALUES (SEC/CUBIC METER)
VERSUS
AVERAGING TIME

DOWNWIND SECTOR	DISTANCE (METERS)	0-2 HOURS	0-8 HOURS	8-24 HOURS	1-4 DAYS	4-30 DAYS	ANNUAL AVERAGE	HOURS PER YEAR MAX 0-2 HR X/Q IS EXCEEDED IN SECTOR	DOWNWIND SECTOR
S	2200.	3.34E-06	1.58E-06	1.09E-06	4.87E-07	1.53E-07	3.69E-08	32.1	S
SSW	2200.	2.92E-06	1.37E-06	9.41E-07	4.14E-07	1.28E-07	3.03E-08	21.8	SSW
SW	2200.	3.19E-06	1.53E-06	1.06E-06	4.81E-07	1.54E-07	3.81E-08	27.5	SW
WSW	2200.	3.34E-06	1.61E-06	1.12E-06	5.07E-07	1.63E-07	4.05E-08	31.1	WSW
W	2200.	3.83E-06	1.84E-06	1.27E-06	5.74E-07	1.83E-07	4.51E-08	43.7	W
WNW	2200.	3.58E-06	1.70E-06	1.17E-06	5.19E-07	1.62E-07	3.92E-08	36.8	WNW
NW	2200.	3.53E-06	1.67E-06	1.15E-06	5.09E-07	1.58E-07	3.80E-08	36.2	NW
NNW	2200.	3.61E-06	1.73E-06	1.20E-06	5.39E-07	1.71E-07	4.22E-08	38.4	NNW
N	2200.	3.00E-06	1.42E-06	9.81E-07	4.37E-07	1.37E-07	3.30E-08	25.3	N
NNE	2200.	3.34E-06	1.64E-06	1.15E-06	5.34E-07	1.77E-07	4.58E-08	30.9	NNE
NE	2200.	3.37E-06	1.63E-06	1.14E-06	5.16E-07	1.67E-07	4.17E-08	33.0	NE
ENE	2200.	3.32E-06	1.59E-06	1.10E-06	4.97E-07	1.58E-07	3.90E-08	30.4	ENE
E	2200.	3.54E-06	1.78E-06	1.27E-06	6.02E-07	2.07E-07	5.61E-08	36.4	E
ESE	2200.	3.52E-06	1.82E-06	1.31E-06	6.43E-07	2.31E-07	6.61E-08	34.7	ESE
SE	2200.	3.69E-06	1.87E-06	1.33E-06	6.39E-07	2.22E-07	6.10E-08	39.7	SE
SSE	2200.	3.28E-06	1.59E-06	1.10E-06	5.02E-07	1.62E-07	4.06E-08	28.9	SSE
MAX X/Q		3.83E-06				TOTAL HOURS AROUND SITE:		526.9	
SRP 2.3.4	2200.	4.46E-06	2.22E-06	1.57E-06	7.37E-07	2.49E-07	6.61E-08		
SITE LIMIT		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.61E-08		

THE FIVE-PERCENT-FOR-THE-ENTIRE-SITE X/Q IS LIMITING.

X/Q VALUES (SEC/CUBIC METER) FOR FUMIGATION AT THE BOUNDARY:

DOWNWIND SECTOR	DISTANCE (METERS)	FUMIGATION X/Q
S	2200.	3.09E-05
SSW	2200.	3.09E-05
SW	2200.	3.09E-05
WSW	2200.	3.09E-05
W	2200.	3.11E-05
WNW	2200.	3.14E-05
NW	2200.	3.20E-05
NNW	2200.	3.24E-05
N	2200.	3.09E-05
NNE	2200.	3.09E-05
NE	2200.	3.09E-05
ENE	2200.	3.09E-05
E	2200.	3.09E-05
ESE	2200.	3.09E-05
SE	2200.	3.09E-05
SSE	2200.	3.09E-05

NOTE: VALUES ON THIS PAGE ARE APPROXIMATIONS ONLY.
CHECK THE REASONABLENESS OF THE ENVELOPES
COMPUTED FOR THE 0-2 HOUR VALUES. FOR ANY
FAULTY ENVELOPES, ADJUST THE ABOVE VALUES.

Station Chimney to Control Room Intake (2500 and 3000 m)

```
   1  1111
Quad Cities                                  Elevated Release
90.2 meters          10.1-90.2 meters

QDC, Elevated Release, Control Room Intake, Station Chimney, Rev 1 met data
   7    0
1564. 43.7 85.8 90.2
    0    0    0    0    0    0    0
   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.
   4.   5.   4.   8.   2.   1.   3.   6.   5.   9.  10.  20.  18.  29.  23.  12.
  33.  45.  30.  25.  12.   9.  28.  57.  28.  90.  49.  47.  78.  59.  72.  73.
  20.  23.  28.  11.   5.  11.  28.  62.  69. 120.  24.  32.  47.  87. 102.  60.
   1.   3.   4.   5.   0.   5.   9.  21.  29.  35.   5.   3.  11.  44.  37.   9.
   1.   0.   2.   2.   0.   1.   0.   4.   3.  16.   0.   0.   2.   6.   8.   0.
   0.   0.   0.   0.   1.   0.   1.   1.   0.   0.   0.   2.   1.   1.   2.   0.
  22.  21.  22.  29.  17.  20.  16.  23.  18.  42.  46.  37.  48.  42.  31.  31.
  46.  53.  54.  29.  24.  41.  44.  69.  45.  99.  57.  64.  70.  65.  72.  53.
  15.  15.  25.  11.  12.  18.  29.  39.  26.  64.  39.  34.  72.  65.  58.  57.
   6.   4.   2.  11.   5.  12.   6.   9.  11.  27.  14.   3.  26.  32.  25.   5.
   0.   1.   1.   3.   0.   2.   1.   3.   3.   6.   4.   1.   7.  11.   8.   2.
   0.   0.   0.   0.   0.   2.   1.   1.   0.   4.   3.   4.   4.   3.   1.   1.
  42.  28.  34.  33.  38.  28.  30.  42.  30.  64.  65.  40.  56.  63.  65.  53.
  43.  54.  50.  31.  37.  39.  53.  69.  41.  93.  49.  60.  76.  69.  59.  61.
  23.  15.  33.  26.  20.  34.  33.  37.  32.  50.  43.  49.  78.  73.  76.  40.
   9.   6.   5.  13.   9.  12.   7.  12.  12.  28.  12.  12.  38.  47.  29.   9.
   1.   1.   0.   4.   2.   5.   0.   0.   5.  16.   3.   1.  17.  22.   8.   3.
  36.  19.  25.  30.  29.  31.  29.  34.  26.  29.  38.  28.  41.  29.  36.  24.
 157. 128. 156. 170. 268. 186. 167. 153. 135. 180. 173. 174. 196. 172. 227. 175.
 295. 260. 334. 351. 391. 296. 229. 264. 182. 208. 246. 275. 340. 519. 505. 308.
 337. 258. 353. 384. 330. 225. 251. 204. 236. 274. 244. 291. 578. 914. 678. 329.
  73. 107. 215. 234.  99. 152. 103.  98. 116. 164. 131. 112. 338. 485. 325. 109.
  25.  26.  71.  78.  16.  62.  43.  59.  71.  64.  51.  48. 233. 307. 113.  19.
  20.  14.   5.  17.  23.  22.  12.   5.  18.  12.  15.  16.   6.   5.  13.  16.
  77.  75.  88.  88. 149.  76.  78.  78.  69.  76.  81.  59.  67.  70.  74.  90.
 187. 159. 169. 182. 255. 211. 198. 219. 205. 264. 201. 168. 208. 204. 236. 247.
 209. 131. 158. 194. 162. 282. 301. 329. 408. 468. 438. 287. 348. 397. 308. 243.
  13.   8.  27.  46.  20.  89.  95. 145. 237. 310. 173.  49.  69.  51.  25.  10.
   1.   0.   4.   6.   4.  24.  14.  61.  85.  99.  24.   5.   4.   3.   0.   1.
  14.  19.  13.  17.  12.   6.   7.   9.  11.   9.   8.  14.  13.  15.   8.   8.
  46.  48.  52.  62.  72.  57.  46.  50.  46.  22.  48.  33.  45.  20.  41.  52.
 104.  75.  99.  80.  95. 113. 122. 205. 166. 179. 104.  72.  61.  60.  80. 108.
  54.  38.  47.  44.  40. 154. 234. 243. 255. 259.  92.  45.  63.  78.  57.  50.
   1.   0.   3.   2.   0.  26.  38.  29.  28.  31.  15.   2.   3.   7.   2.   2.
   0.   0.   0.   0.   0.   0.   0.   0.   0.   2.   0.   0.   0.   0.   0.   0.
  10.  11.   9.  14.  14.  10.   7.  11.   8.  11.   5.   1.   9.   7.   2.   8.
  23.  27.  26.  31.  24.  33.  45.  20.  39.  40.  44.  26.  28.  15.  12.  23.
  30.  23.  29.  28.  24.  48.  76.  99.  89.  88.  64.  23.  39.  27.  25.  16.
  15.  10.  10.   0.   5.  22.  74. 115.  91. 119.  30.   8.   9.  12.   9.  13.
   1.   0.   0.   0.   1.   6.  12.   6.   3.   6.   1.   1.   0.   1.   0.   0.
   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.
 101. 0.75 3.50 7.50 12.5 18.5 24.0 55.0
2500.2500.2500.2500.2500.2500.2500.2500.2500.2500.2500.2500.2500.2500.2500.2500.
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3000.3000.3000.3000.3000.3000.3000.3000.3000.3000.3000.3000.3000.3000.3000.3000.
   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.
   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.
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USNRC COMPUTER CODE-PAVAN, VERSION 2.0 RUN DATE: 09/14/04

PRINTOUT OF INPUT CARDS

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   1     00010 01111 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000   2     Quad Cities
Elevated Release
   3     90.2 meters         10.1-90.2 meters
   4
   5     QDC, Elevated Release, Control Room Intake, Station Chimney, Rev 1 met data        6          7 42727     0
   7          0.500  1564.000    43.700    85.800    90.200
   8       0.000  0.000  0.000  0.000  0.000  0.000  0.000
   9       0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000
   9       4.000  5.000  4.000  8.000  2.000  1.000  3.000  6.000  5.000  9.000 10.000 20.000 18.000 29.000 23.000 12.000
   9      33.000 45.000 30.000 25.000 12.000  9.000 28.000 57.000 28.000 90.000 49.000 47.000 78.000 59.000 72.000 73.000
   9      20.000 23.000 28.000 11.000  5.000 11.000 28.000 62.000 69.000120.000 24.000 32.000 47.000 87.000102.000 60.000
   9       1.000  3.000  4.000  5.000  0.000  5.000  9.000 21.000 29.000 35.000  5.000  3.000 11.000 44.000 37.000  9.000
   9       1.000  0.000  2.000  2.000  0.000  1.000  0.000  4.000  3.000 16.000  0.000  0.000  2.000  6.000  8.000  0.000
   9       0.000  0.000  0.000  0.000  1.000  0.000  1.000  1.000  0.000  0.000  0.000  2.000  1.000  1.000  2.000  0.000
   9      22.000 21.000 22.000 29.000 17.000 20.000 16.000 23.000 18.000 42.000 46.000 37.000 48.000 42.000 31.000 31.000
   9      46.000 53.000 54.000 29.000 24.000 41.000 44.000 69.000 45.000 99.000 57.000 64.000 70.000 65.000 72.000 53.000
   9      15.000 15.000 25.000 11.000 12.000 18.000 29.000 39.000 26.000 64.000 39.000 34.000 72.000 65.000 58.000 57.000
   9       6.000  4.000  2.000 11.000  5.000 12.000  6.000  9.000 11.000 27.000 14.000  3.000 26.000 32.000 25.000  5.000
   9       0.000  1.000  1.000  3.000  0.000  2.000  1.000  3.000  3.000  6.000  4.000  1.000  7.000 11.000  8.000  2.000
   9       0.000  0.000  0.000  0.000  0.000  2.000  1.000  1.000  0.000  4.000  3.000  4.000  4.000  3.000  1.000  1.000
   9      42.000 28.000 34.000 33.000 38.000 28.000 30.000 42.000 30.000 64.000 65.000 40.000 56.000 63.000 65.000 53.000
   9      43.000 54.000 50.000 31.000 37.000 39.000 53.000 69.000 41.000 93.000 49.000 60.000 76.000 69.000 59.000 61.000
   9      23.000 15.000 33.000 26.000 20.000 34.000 33.000 37.000 32.000 50.000 43.000 49.000 78.000 73.000 76.000 40.000
   9       9.000  6.000  5.000 13.000  9.000 12.000  7.000 12.000 12.000 28.000 12.000 12.000 38.000 47.000 29.000  9.000
   9       1.000  1.000  0.000  4.000  2.000  5.000  0.000  0.000  5.000 16.000  3.000  1.000 17.000 22.000  8.000  3.000
   9      36.000 19.000 25.000 30.000 29.000 31.000 29.000 34.000 26.000 29.000 38.000 28.000 41.000 29.000 36.000 24.000
   9     157.000128.000156.000170.000268.000186.000167.000153.000135.000180.000173.000174.000196.000172.000227.000175.000
   9     295.000260.000334.000351.000391.000296.000229.000264.000182.000208.000246.000275.000340.000519.000505.000308.000
   9     337.000258.000353.000384.000330.000225.000251.000204.000236.000274.000244.000291.000578.000914.000678.000329.000
   9      73.000107.000215.000234.000 99.000152.000103.000 98.000116.000164.000131.000112.000338.000485.000325.000109.000
   9      25.000 26.000 71.000 78.000 16.000 62.000 43.000 59.000 71.000 64.000 51.000 48.000233.000307.000113.000 19.000
   9      20.000 14.000  5.000 17.000 23.000 22.000 12.000  5.000 18.000 12.000 15.000 16.000  6.000  5.000 13.000 16.000
   9      77.000 75.000 88.000 88.000149.000 76.000 78.000 78.000 69.000 76.000 81.000 59.000 67.000 70.000 74.000 90.000
   9     187.000159.000169.000182.000255.000211.000198.000219.000205.000264.000201.000168.000208.000204.000236.000247.000
   9     209.000131.000158.000194.000162.000282.000301.000329.000408.000468.000438.000287.000348.000397.000308.000243.000
   9      13.000  8.000 27.000 46.000 20.000 89.000 95.000145.000237.000310.000173.000 49.000 69.000 51.000 25.000 10.000
   9       1.000  0.000  4.000  6.000  4.000 24.000 14.000 61.000 85.000 99.000 24.000  5.000  4.000  3.000  0.000  1.000
   9      14.000 19.000 13.000 17.000 12.000  6.000  7.000  9.000 11.000  9.000  8.000 14.000 13.000 15.000  8.000  8.000
   9      46.000 48.000 52.000 62.000 72.000 57.000 46.000 50.000 46.000 22.000 48.000 33.000 45.000 20.000 41.000 52.000
   9     104.000 75.000 99.000 80.000 95.000113.000122.000205.000166.000179.000104.000 72.000 61.000 60.000 80.000108.000
   9      54.000 38.000 47.000 44.000 40.000154.000234.000243.000255.000259.000 92.000 45.000 63.000 78.000 57.000 50.000
   9       1.000  0.000  3.000  2.000  0.000 26.000 38.000 29.000 28.000 31.000 15.000  2.000  3.000  7.000  2.000  2.000
   9       0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  2.000  0.000  0.000  0.000  0.000  0.000  0.000
   9      10.000 11.000  9.000 14.000 14.000 10.000  7.000 11.000  8.000 11.000  5.000  1.000  9.000  7.000  2.000  8.000
   9      23.000 27.000 26.000 31.000 24.000 33.000 45.000 20.000 39.000 40.000 44.000 26.000 28.000 15.000 12.000 23.000
   9      30.000 23.000 29.000 28.000 24.000 48.000 76.000 99.000 89.000 88.000 64.000 23.000 39.000 27.000 25.000 16.000
   9      15.000 10.000 10.000  0.000  5.000 22.000 74.000115.000 91.000119.000 30.000  8.000  9.000 12.000  9.000 13.000
   9       1.000  0.000  0.000  0.000  1.000  6.000 12.000  6.000  3.000  6.000  1.000  1.000  0.000  1.000  0.000  0.000
   9       0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  10        101.  0.750  3.500
7.500 12.500 18.500 24.000 55.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  11       2500.  2500.  2500.  2500.  2500.  2500.  2500.  2500.  2500.
2500.  2500.  2500.  2500.  2500.  2500.  2500.  11       3000.  3000.  3000.  3000.  3000.  3000.  3000.  3000.  3000.  3000.  3000.  3000.  3000.
3000.  3000.  12         1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0
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12	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0

USNRC COMPUTER CODE-PAVAN, VERSION 2.0 RUN DATE: 09/14/04

PLANT NAME: Quad Cities
DATA PERIOD:
TYPE OF RELEASE: Elevated Release
SOURCE OF DATA:
COMMENTS: QDC, Elevated Release, Control Room Intake, Station Chimney, Rev 1 met data
PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145

METEOROLOGICAL INSTRUMENTATION
WIND SENSORS HEIGHT: 90.2 meters
DELTA-T HEIGHTS: 10.1-90.2 meters

RELATIVE CONCENTRATION (X/Q) VALUES (SEC/CUBIC METER)
VERSUS
AVERAGING TIME

DOWNWIND SECTOR	DISTANCE (METERS)	0-2 HOURS	0-8 HOURS	8-24 HOURS	1-4 DAYS	4-30 DAYS	ANNUAL AVERAGE	HOURS PER YEAR MAX 0-2 HR X/Q IS EXCEEDED IN SECTOR	DOWNWIND SECTOR
S	2500.	3.32E-06	1.57E-06	1.08E-06	4.81E-07	1.50E-07	3.62E-08	32.3	S
SSW	2500.	2.90E-06	1.36E-06	9.31E-07	4.09E-07	1.26E-07	2.96E-08	21.9	SSW
SW	2500.	3.17E-06	1.52E-06	1.05E-06	4.74E-07	1.51E-07	3.73E-08	27.7	SW
WSW	2500.	3.32E-06	1.60E-06	1.11E-06	5.02E-07	1.61E-07	3.99E-08	31.4	WSW
W	2500.	3.80E-06	1.82E-06	1.26E-06	5.70E-07	1.82E-07	4.48E-08	43.7	W
WNW	2500.	3.53E-06	1.67E-06	1.15E-06	5.13E-07	1.60E-07	3.87E-08	36.4	WNW
NW	2500.	3.47E-06	1.64E-06	1.13E-06	4.99E-07	1.55E-07	3.72E-08	35.3	NW
NNW	2500.	3.53E-06	1.69E-06	1.17E-06	5.25E-07	1.67E-07	4.09E-08	37.2	NNW
N	2500.	2.98E-06	1.42E-06	9.76E-07	4.35E-07	1.36E-07	3.29E-08	25.5	N
NNE	2500.	3.32E-06	1.63E-06	1.14E-06	5.25E-07	1.73E-07	4.44E-08	31.2	NNE
NE	2500.	3.35E-06	1.62E-06	1.12E-06	5.09E-07	1.64E-07	4.07E-08	33.2	NE
ENE	2500.	3.30E-06	1.58E-06	1.09E-06	4.88E-07	1.55E-07	3.78E-08	30.6	ENE
E	2500.	3.51E-06	1.76E-06	1.25E-06	5.90E-07	2.01E-07	5.40E-08	36.7	E
ESE	2500.	3.50E-06	1.80E-06	1.30E-06	6.32E-07	2.25E-07	6.39E-08	35.0	ESE
SE	2500.	3.67E-06	1.85E-06	1.32E-06	6.28E-07	2.17E-07	5.91E-08	39.9	SE
SSE	2500.	3.26E-06	1.57E-06	1.09E-06	4.95E-07	1.59E-07	3.95E-08	29.1	SSE
MAX X/Q		3.80E-06				TOTAL HOURS AROUND SITE:		527.0	
SRP 2.3.4	2500.	4.40E-06	2.18E-06	1.54E-06	7.21E-07	2.42E-07	6.39E-08		
SITE LIMIT		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.39E-08		

THE FIVE-PERCENT-FOR-THE-ENTIRE-SITE X/Q IS LIMITING.

X/Q VALUES (SEC/CUBIC METER) FOR FUMIGATION AT THE BOUNDARY:

DOWNWIND SECTOR	DISTANCE (METERS)	FUMIGATION X/Q
S	2500.	2.75E-05
SSW	2500.	2.75E-05
SW	2500.	2.75E-05
WSW	2500.	2.75E-05
W	2500.	2.77E-05
WNW	2500.	2.79E-05
NW	2500.	2.85E-05
NNW	2500.	2.88E-05
N	2500.	2.75E-05
NNE	2500.	2.75E-05
NE	2500.	2.75E-05
ENE	2500.	2.75E-05
E	2500.	2.75E-05
ESE	2500.	2.75E-05
SE	2500.	2.75E-05
SSE	2500.	2.75E-05

NOTE: VALUES ON THIS PAGE ARE APPROXIMATIONS ONLY.
CHECK THE REASONABLENESS OF THE ENVELOPES
COMPUTED FOR THE 0-2 HOUR VALUES. FOR ANY
FAULTY ENVELOPES, ADJUST THE ABOVE VALUES.

USNRC COMPUTER CODE-PAVAN, VERSION 2.0 RUN DATE: 09/14/04

PLANT NAME: Quad Cities METEOROLOGICAL INSTRUMENTATION
DATA PERIOD: WIND SENSORS HEIGHT: 90.2 meters
TYPE OF RELEASE: Elevated Release DELTA-T HEIGHTS: 10.1-90.2 meters
SOURCE OF DATA:
COMMENTS: QDC, Elevated Release, Control Room Intake, Station Chimney, Rev 1 met data
PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145

RELATIVE CONCENTRATION (X/Q) VALUES (SEC/CUBIC METER)
VERSUS
AVERAGING TIME

DOWNWIND SECTOR	DISTANCE (METERS)	0-2 HOURS	0-8 HOURS	8-24 HOURS	1-4 DAYS	4-30 DAYS	ANNUAL AVERAGE	HOURS PER YEAR MAX 0-2 HR X/Q IS EXCEEDED IN SECTOR	DOWNWIND SECTOR
S	3000.	3.06E-06	1.46E-06	1.00E-06	4.48E-07	1.41E-07	3.41E-08	31.3	S
SSW	3000.	2.72E-06	1.28E-06	8.73E-07	3.84E-07	1.18E-07	2.78E-08	22.1	SSW
SW	3000.	2.94E-06	1.41E-06	9.79E-07	4.42E-07	1.41E-07	3.48E-08	27.1	SW
WSW	3000.	3.09E-06	1.49E-06	1.04E-06	4.70E-07	1.51E-07	3.77E-08	30.8	WSW
W	3000.	3.57E-06	1.72E-06	1.19E-06	5.38E-07	1.72E-07	4.26E-08	43.7	W
WNW	3000.	3.31E-06	1.57E-06	1.08E-06	4.83E-07	1.51E-07	3.67E-08	36.1	WNW
NW	3000.	3.22E-06	1.52E-06	1.05E-06	4.66E-07	1.46E-07	3.50E-08	34.2	NW
NNW	3000.	3.24E-06	1.56E-06	1.08E-06	4.86E-07	1.55E-07	3.82E-08	35.5	NNW
N	3000.	2.81E-06	1.34E-06	9.26E-07	4.15E-07	1.31E-07	3.18E-08	25.6	N
NNE	3000.	3.13E-06	1.53E-06	1.07E-06	4.94E-07	1.62E-07	4.16E-08	31.4	NNE
NE	3000.	3.16E-06	1.52E-06	1.06E-06	4.79E-07	1.54E-07	3.83E-08	33.4	NE
ENE	3000.	3.11E-06	1.48E-06	1.02E-06	4.57E-07	1.44E-07	3.51E-08	30.9	ENE
E	3000.	3.27E-06	1.64E-06	1.16E-06	5.47E-07	1.86E-07	4.97E-08	36.1	E
ESE	3000.	3.23E-06	1.67E-06	1.20E-06	5.84E-07	2.08E-07	5.89E-08	33.8	ESE
SE	3000.	3.40E-06	1.72E-06	1.22E-06	5.82E-07	2.01E-07	5.47E-08	38.8	SE
SSE	3000.	3.07E-06	1.48E-06	1.03E-06	4.65E-07	1.49E-07	3.69E-08	29.4	SSE
MAX X/Q		3.57E-06				TOTAL HOURS AROUND SITE:		520.1	
SRP 2.3.4	3000.	4.07E-06	2.02E-06	1.42E-06	6.66E-07	2.24E-07	5.89E-08		
SITE LIMIT		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.89E-08		

THE FIVE-PERCENT-FOR-THE-ENTIRE-SITE X/Q IS LIMITING.

X/Q VALUES (SEC/CUBIC METER) FOR FUMIGATION AT THE BOUNDARY:

DOWNWIND SECTOR	DISTANCE (METERS)	FUMIGATION X/Q
S	3000.	2.33E-05
SSW	3000.	2.33E-05
SW	3000.	2.33E-05
WSW	3000.	2.33E-05
W	3000.	2.35E-05
WNW	3000.	2.37E-05
NW	3000.	2.42E-05
NNW	3000.	2.45E-05
N	3000.	2.33E-05
NNE	3000.	2.33E-05
NE	3000.	2.33E-05
ENE	3000.	2.33E-05
E	3000.	2.33E-05
ESE	3000.	2.33E-05
SE	3000.	2.33E-05
SSE	3000.	2.33E-05

NOTE: VALUES ON THIS PAGE ARE APPROXIMATIONS ONLY.
CHECK THE REASONABLENESS OF THE ENVELOPES
COMPUTED FOR THE 0-2 HOUR VALUES. FOR ANY
FAULTY ENVELOPES, ADJUST THE ABOVE VALUES.

Unit 1 and 2 Reactor Building Vent Exhaust Stack

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   1  1111
Quad Cities                                   Ground Release
10.1 meters          10.1-59.7 meters

QDC, Ground Release, EAB and LPZ, Unit 1 & 2 Vent Exhaust Stack, Rev 1 met data
    7    0
1564. 43.7 10.0 10.1
    0    0    0    0    0    0    0
   0.   0.   1.   0.   0.   0.   0.   3.   0.   0.   0.   1.   1.   2.   1.   1.
  78.  68.  48.  50.  27.  24.  52. 134.  99. 255. 192. 170. 261. 211. 186. 111.
  71.  63.  72.  47.  26.  67.  63.  95.  70. 158. 111.  55. 204. 226. 237. 156.
   6.   4.   6.  12.   2.  17.   7.   4.   7.   3.   1.   1.  16.  39.  18.   8.
   0.   0.   0.   1.   0.   1.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.
   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.
   0.   2.   0.   0.   1.   0.   0.   0.   1.   0.   1.   1.   3.   3.   5.   0.
  29.  26.  32.  30.  19.  28.  33.  55.  33.  55.  58.  56.  58.  57.  45.  47.
  16.  12.  23.  22.  23.  19.  16.   8.   5.  16.  20.  17.  39.  37.  27.  23.
   3.   5.   0.   1.   3.   4.   0.   0.   0.   0.   0.   3.   6.  13.   3.   2.
   0.   0.   0.   1.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.
   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.
   1.   2.   3.   6.   6.   7.   1.   2.   5.   7.  10.  11.  14.  12.   6.   4.
  63.  60.  62.  52.  54.  75.  78. 108.  64. 142. 154. 116. 125. 122. 112.  69.
  44.  20.  37.  38.  33.  39.  24.  18.  16.  30.  29.  33. 100.  67.  75.  34.
   3.   5.   1.   3.   6.   6.   4.   1.   1.   0.   5.   1.  29.  29.   5.   3.
   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.
   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.
  95.  65.  86. 115. 118. 102. 115. 114.  97. 100. 154. 166. 176. 142. 146.  75.
 409. 293. 460. 561. 586. 449. 416. 405. 272. 365. 485. 454. 754. 889. 687. 367.
 322. 213. 375. 440. 341. 260. 160.  77.  73. 142. 217. 244. 643. 891. 473. 205.
  61.  50.  84.  87.  35.  66.  27.  13.   2.   7.  17.  33. 170. 229.  83.  17.
   1.   0.   1.   2.   1.   2.   0.   0.   0.   1.  16.  10.  11.   7.   0.   0.
   0.   0.   0.   0.   0.   1.   0.   0.   0.   0.   0.   1.   0.   0.   0.   0.
 148. 144. 190. 227. 275. 216. 258. 256. 211. 184. 251. 302. 297. 314. 243. 170.
 325. 167. 324. 398. 373. 429. 411. 381. 394. 498. 665. 471. 654. 560. 552. 368.
  52.  38.  68. 133.  98. 144.  99.  96. 121. 190. 193.  77.  63. 101.  76.  38.
   1.   1.   6.   7.  11.  18.  10.   9.   7.   3.   7.   1.   4.   5.   3.   2.
   0.   0.   0.   0.   1.   3.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.
   0.   0.   0.   0.   0.   3.   0.   0.   0.   0.   0.   0.   1.   0.   0.   0.
 131. 143. 177. 184. 319. 391. 311. 313. 231. 180. 137. 131. 213. 281. 172. 129.
  23.  21.  40.  48.  69. 201. 132. 103.  79.  94.  40.  14.  49.  38.  38.  25.
   0.   1.   0.  51.   0.   4.   1.   1.   3.   7.   1.   0.   0.   1.   0.   0.
   0.   0.   0.   0.   0.   1.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.
   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.
   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.
  72. 101. 108. 155. 480. 552. 278. 198. 129.  85.  77.  81. 128. 181.  78.  67.
   1.   8.   2.   2.  36. 155.  28.  11.   7.   3.   1.   0.   6.  18.   4.   2.
   0.   0.   0. 234.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.
   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.
   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.
   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.
 101. 0.75 3.50 7.50 12.5 18.5 24.0 55.0
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4828.4828.4828.4828.4828.4828.4828.4828.4828.4828.4828.4828.4828.4828.4828.4828.
   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.
   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.
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USNRC COMPUTER CODE-PAVAN, VERSION 2.0          RUN DATE: 09/13/04


PRINTOUT OF INPUT CARDS

   1     00010 01111 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000   2     Quad Cities
Ground Release
   3     10.1 meters          10.1-59.7 meters
   4
   5     QDC, Ground Release, EAB and LPZ, Unit 1 & 2 Vent Exhaust Stack, Rev 1 met data    6          7 43178   - 0
   7          0.500  1564.000    43.700    10.000    10.100
   8       0.000  0.000  0.000  0.000  0.000  0.000  0.000
   9       0.000  0.000  1.000  0.000  0.000  0.000  0.000  3.000  0.000  0.000  0.000  1.000  1.000  2.000  1.000  1.000
   9      78.000 68.000 48.000 50.000 27.000 24.000 52.000134.000 99.000255.000192.000170.000261.000211.000186.000111.000
   9      71.000 63.000 72.000 47.000 26.000 67.000 63.000 95.000 70.000158.000111.000 55.000204.000226.000237.000156.000
   9       6.000  4.000  6.000 12.000  2.000 17.000  7.000  4.000  7.000  3.000  1.000  1.000 16.000 39.000 18.000  8.000
   9       0.000  0.000  0.000  1.000  0.000  1.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000
   9       0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000
   9       0.000  2.000  0.000  0.000  1.000  0.000  0.000  0.000  1.000  0.000  1.000  1.000  3.000  3.000  5.000  0.000
   9      29.000 26.000 32.000 30.000 19.000 28.000 33.000 55.000 33.000 55.000 58.000 56.000 58.000 57.000 45.000 47.000
   9      16.000 12.000 23.000 22.000 23.000 19.000 16.000  8.000  5.000 16.000 20.000 17.000 39.000 37.000 27.000 23.000
   9       3.000  5.000  0.000  1.000  3.000  4.000  0.000  0.000  0.000  0.000  0.000  3.000  6.000 13.000  3.000  2.000
   9       0.000  0.000  0.000  1.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000
   9       0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000
   9       1.000  2.000  3.000  6.000  6.000  7.000  1.000  2.000  5.000  7.000 10.000 11.000 14.000 12.000  6.000  4.000
   9      63.000 60.000 62.000 52.000 54.000 75.000 78.000108.000 64.000142.000154.000116.000125.000122.000112.000 69.000
   9      44.000 20.000 37.000 38.000 33.000 39.000 24.000 18.000 16.000 30.000 29.000 33.000100.000 67.000 75.000 34.000
   9       3.000  5.000  1.000  3.000  6.000  6.000  4.000  1.000  1.000  0.000  5.000  1.000 29.000 29.000  5.000  3.000
   9       0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000
   9       0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000
   9      95.000 65.000 86.000115.000118.000102.000115.000114.000 97.000100.000154.000166.000176.000142.000146.000 75.000
   9     409.000293.000460.000561.000586.000449.000416.000405.000272.000365.000485.000454.000754.000889.000687.000367.000
   9     322.000213.000375.000440.000341.000260.000160.000 77.000 73.000142.000217.000244.000643.000891.000473.000205.000
   9      61.000 50.000 84.000 87.000 35.000 66.000 27.000 13.000  2.000  7.000 17.000 33.000170.000229.000 83.000 17.000
   9       1.000  0.000  1.000  2.000  1.000  2.000  0.000  0.000  0.000  1.000 16.000 10.000 11.000  7.000  0.000  0.000
   9       0.000  0.000  0.000  0.000  0.000  1.000  0.000  0.000  0.000  0.000  0.000  1.000  0.000  0.000  0.000  0.000
   9     148.000144.000190.000227.000275.000216.000258.000256.000211.000184.000251.000302.000297.000314.000243.000170.000
   9     325.000167.000324.000398.000373.000429.000411.000381.000394.000498.000665.000471.000654.000560.000552.000368.000
   9      52.000 38.000 68.000133.000 98.000144.000 99.000 96.000121.000190.000193.000 77.000 63.000101.000 76.000 38.000
   9       1.000  1.000  6.000  7.000 11.000 18.000 10.000  9.000  7.000  3.000  7.000  1.000  4.000  5.000  3.000  2.000
   9       0.000  0.000  0.000  0.000  1.000  3.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000
   9       0.000  0.000  0.000  0.000  0.000  3.000  0.000  0.000  0.000  0.000  0.000  0.000  1.000  0.000  0.000  0.000
   9     131.000143.000177.000184.000319.000391.000311.000313.000231.000180.000137.000131.000213.000281.000172.000129.000
   9      23.000 21.000 40.000 48.000 69.000201.000132.000103.000 79.000 94.000 40.000 14.000 49.000 38.000 38.000 25.000
   9       0.000  1.000  0.000 51.000  0.000  4.000  1.000  1.000  3.000  7.000  1.000  0.000  0.000  1.000  0.000  0.000
   9       0.000  0.000  0.000  0.000  0.000  1.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000
   9       0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000
   9       0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000
   9      72.000101.000108.000155.000480.000552.000278.000198.000129.000 85.000 77.000 81.000128.000181.000 78.000 67.000
   9       1.000  8.000  2.000  2.000 36.000155.000 28.000 11.000  7.000  3.000  1.000  0.000  6.000 18.000  4.000  2.000
   9       0.000  0.000  0.000234.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000
   9       0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000
   9       0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000
   9       0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  10        101.  0.750  3.500
7.500 12.500 18.500 24.000 55.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  11        380.   380.   380.   380.   380.   380.   380.   380.   380.
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380.   380.   380.   380.   380.   380.   380.  11        4828.  4828.  4828.  4828.  4828.  4828.  4828.  4828.  4828.  4828.  4828.  4828.  4828.  4828.
4828.  4828.  12          1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0
  12          1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0    1.0
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USNRC COMPUTER CODE-PAVAN, VERSION 2.0 RUN DATE: 09/13/04

PLANT NAME: Quad Cities
DATA PERIOD:
TYPE OF RELEASE: Ground Release
SOURCE OF DATA:
COMMENTS: QDC, Ground Release, EAB and LPZ, Unit 1 & 2 Vent Exhaust Stack, Rev 1 met data
PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145

METEOROLOGICAL INSTRUMENTATION
WIND SENSORS HEIGHT: 10.1 meters
DELTA-T HEIGHTS: 10.1-59.7 meters

RELATIVE CONCENTRATION (X/Q) VALUES (SEC/CUBIC METER)
VERSUS
AVERAGING TIME

DOWNWIND SECTOR	DISTANCE (METERS)	0-2 HOURS	0-8 HOURS	8-24 HOURS	1-4 DAYS	4-30 DAYS	ANNUAL AVERAGE	HOURS PER YEAR MAX 0-2 HR X/Q IS EXCEEDED IN SECTOR	DOWNWIND SECTOR
S	380.	4.82E-04	2.40E-04	1.70E-04	7.96E-05	2.69E-05	7.12E-06	3.1	S
SSW	380.	5.39E-04	2.61E-04	1.82E-04	8.29E-05	2.68E-05	6.73E-06	5.3	SSW
SW	380.	5.69E-04	2.86E-04	2.03E-04	9.60E-05	3.28E-05	8.84E-06	5.1	SW
WSW	380.	6.69E-04	3.44E-04	2.46E-04	1.19E-04	4.23E-05	1.19E-05	7.1	WSW
W	380.	1.36E-03	6.68E-04	4.69E-04	2.18E-04	7.22E-05	1.87E-05	43.7	W
WNW	380.	9.80E-04	5.22E-04	3.81E-04	1.92E-04	7.21E-05	2.17E-05	10.5	WNW
NW	380.	8.73E-04	4.44E-04	3.17E-04	1.52E-04	5.30E-05	1.46E-05	17.3	NW
NNW	380.	7.41E-04	3.79E-04	2.71E-04	1.31E-04	4.60E-05	1.28E-05	9.4	NNW
N	380.	6.26E-04	3.14E-04	2.23E-04	1.05E-04	3.61E-05	9.71E-06	5.4	N
NNE	380.	5.44E-04	2.77E-04	1.98E-04	9.51E-05	3.33E-05	9.19E-06	3.1	NNE
NE	380.	4.99E-04	2.61E-04	1.89E-04	9.35E-05	3.41E-05	9.91E-06	3.4	NE
ENE	380.	4.96E-04	2.57E-04	1.85E-04	9.10E-05	3.27E-05	9.38E-06	4.0	ENE
E	380.	6.17E-04	3.28E-04	2.39E-04	1.20E-04	4.47E-05	1.34E-05	5.9	E
ESE	380.	7.14E-04	3.79E-04	2.76E-04	1.39E-04	5.17E-05	1.55E-05	8.5	ESE
SE	380.	5.32E-04	2.78E-04	2.01E-04	9.96E-05	3.63E-05	1.05E-05	2.7	SE
SSE	380.	4.75E-04	2.36E-04	1.67E-04	7.82E-05	2.64E-05	6.98E-06	2.7	SSE
MAX X/Q		1.36E-03				TOTAL HOURS AROUND SITE:		137.3	
SRP 2.3.4	380.	1.83E-03	8.80E-04	6.10E-04	2.75E-04	8.78E-05	2.17E-05		
SITE LIMIT		8.57E-04	4.67E-04	3.44E-04	1.78E-04	6.91E-05	2.17E-05		

0.5 PERCENT X/Q TO AN INDIVIDUAL IS LIMITING.

NOTE: VALUES ON THIS PAGE ARE APPROXIMATIONS ONLY.
CHECK THE REASONABLENESS OF THE ENVELOPES
COMPUTED FOR THE 0-2 HOUR VALUES. FOR ANY
FAULTY ENVELOPES, ADJUST THE ABOVE VALUES.

USNRC COMPUTER CODE-PAVAN, VERSION 2.0 RUN DATE: 09/13/04

PLANT NAME: Quad Cities
DATA PERIOD:
TYPE OF RELEASE: Ground Release
SOURCE OF DATA:
COMMENTS: QDC, Ground Release, EAB and LPZ, Unit 1 & 2 Vent Exhaust Stack, Rev 1 met data
PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145

METEOROLOGICAL INSTRUMENTATION
WIND SENSORS HEIGHT: 10.1 meters
DELTA-T HEIGHTS: 10.1-59.7 meters

RELATIVE CONCENTRATION (X/Q) VALUES (SEC/CUBIC METER)
VERSUS
AVERAGING TIME

DOWNWIND SECTOR	DISTANCE (METERS)	0-2 HOURS	0-8 HOURS	8-24 HOURS	1-4 DAYS	4-30 DAYS	ANNUAL AVERAGE	HOURS PER YEAR MAX 0-2 HR X/Q IS EXCEEDED IN SECTOR	DOWNWIND SECTOR
S	4828.	2.31E-05	1.01E-05	6.67E-06	2.72E-06	7.50E-07	1.55E-07	3.1	S
SSW	4828.	2.71E-05	1.14E-05	7.43E-06	2.91E-06	7.58E-07	1.46E-07	5.3	SSW
SW	4828.	2.93E-05	1.28E-05	8.45E-06	3.43E-06	9.42E-07	1.94E-07	5.1	SW
WSW	4828.	3.85E-05	1.68E-05	1.11E-05	4.54E-06	1.25E-06	2.59E-07	5.0	WSW
W	4828.	1.04E-04	4.14E-05	2.62E-05	9.69E-06	2.32E-06	4.05E-07	43.7	W
WNW	4828.	9.74E-05	4.03E-05	2.59E-05	9.96E-06	2.52E-06	4.69E-07	40.4	WNW
NW	4828.	5.46E-05	2.34E-05	1.53E-05	6.08E-06	1.62E-06	3.21E-07	17.3	NW
NNW	4828.	4.30E-05	1.87E-05	1.24E-05	5.01E-06	1.37E-06	2.81E-07	9.4	NNW
N	4828.	3.37E-05	1.46E-05	9.62E-06	3.89E-06	1.06E-06	2.16E-07	5.4	N
NNE	4828.	2.75E-05	1.22E-05	8.11E-06	3.35E-06	9.44E-07	2.00E-07	3.1	NNE
NE	4828.	2.42E-05	1.11E-05	7.53E-06	3.23E-06	9.59E-07	2.17E-07	3.4	NE
ENE	4828.	2.40E-05	1.09E-05	7.37E-06	3.14E-06	9.20E-07	2.05E-07	4.0	ENE
E	4828.	3.30E-05	1.51E-05	1.02E-05	4.35E-06	1.28E-06	2.89E-07	5.9	E
ESE	4828.	4.07E-05	1.84E-05	1.24E-05	5.23E-06	1.52E-06	3.34E-07	8.5	ESE
SE	4828.	2.66E-05	1.21E-05	8.18E-06	3.48E-06	1.02E-06	2.28E-07	2.7	SE
SSE	4828.	2.25E-05	9.87E-06	6.53E-06	2.66E-06	7.35E-07	1.52E-07	2.7	SSE
MAX X/Q		1.04E-04				TOTAL HOURS AROUND SITE:		165.1	
SRP 2.3.4	4828.	9.92E-05	4.09E-05	2.63E-05	1.01E-05	2.53E-06	4.69E-07		
SITE LIMIT		5.32E-05	2.43E-05	1.65E-05	7.04E-06	2.08E-06	4.69E-07		

0.5 PERCENT X/Q TO AN INDIVIDUAL IS LIMITING.

NOTE: VALUES ON THIS PAGE ARE APPROXIMATIONS ONLY.
CHECK THE REASONABLENESS OF THE ENVELOPES
COMPUTED FOR THE 0-2 HOUR VALUES. FOR ANY
FAULTY ENVELOPES, ADJUST THE ABOVE VALUES.

Computer Disclosure Sheet

Discipline Nuclear

Client:: Exelon Corporation
Project: Quad Cities Station

Date: August 2005
Job No. 27450-NCS0032.CN1

Program(s) used	Rev No.	Rev. Date
ARCON96	1	5/1997

Calculation No.: QDC-0000-M-1408, Rev. 1
Status [ ] Prelim.
[X] Final
[ ] Void

WGI Prequalification [X] Yes
[ ] No

Run No. 1

Description: ARCON96 X/Q analysis consistent with procedures in Regulatory Guide 1.194 for Control Room habitability assessments.

Analysis Description: ARCON96 calculations of X/Q are performed for ground and stack releases to the Control Room Intake. Centerline X/Q values, sector X/Q values and 95% max X/Q values are computed for 0-2 hours, 2-8 hours and 8-24 hours, 1-4 days, and 4-30 days.

The attached computer output has been reviewed, the input data checked,
And the results approved for release. Input criteria for this analysis were established.

By:	On:
Run by: T.Thomas	8/5/2005
Checked by: J. Robinson	8/5/2005
Approved by: H. Rothstein	8/5/05

Remarks: WGI Form for Computer Software Control

Computer Disclosure Sheet

Discipline Nuclear

Client:: Exelon Corporation
Project: Quad Cities Station

Date: August 2005
Job No. 27450-NCS0032.CN1

Program(s) used	Rev No.	Rev. Date
PAVAN	2	12/1997

Calculation No.: QDC-0000-M-1408, Rev. 1
Status [ ] Prelim.
[X] Final
[ ] Void

WGI Prequalification [X] Yes
[ ] No

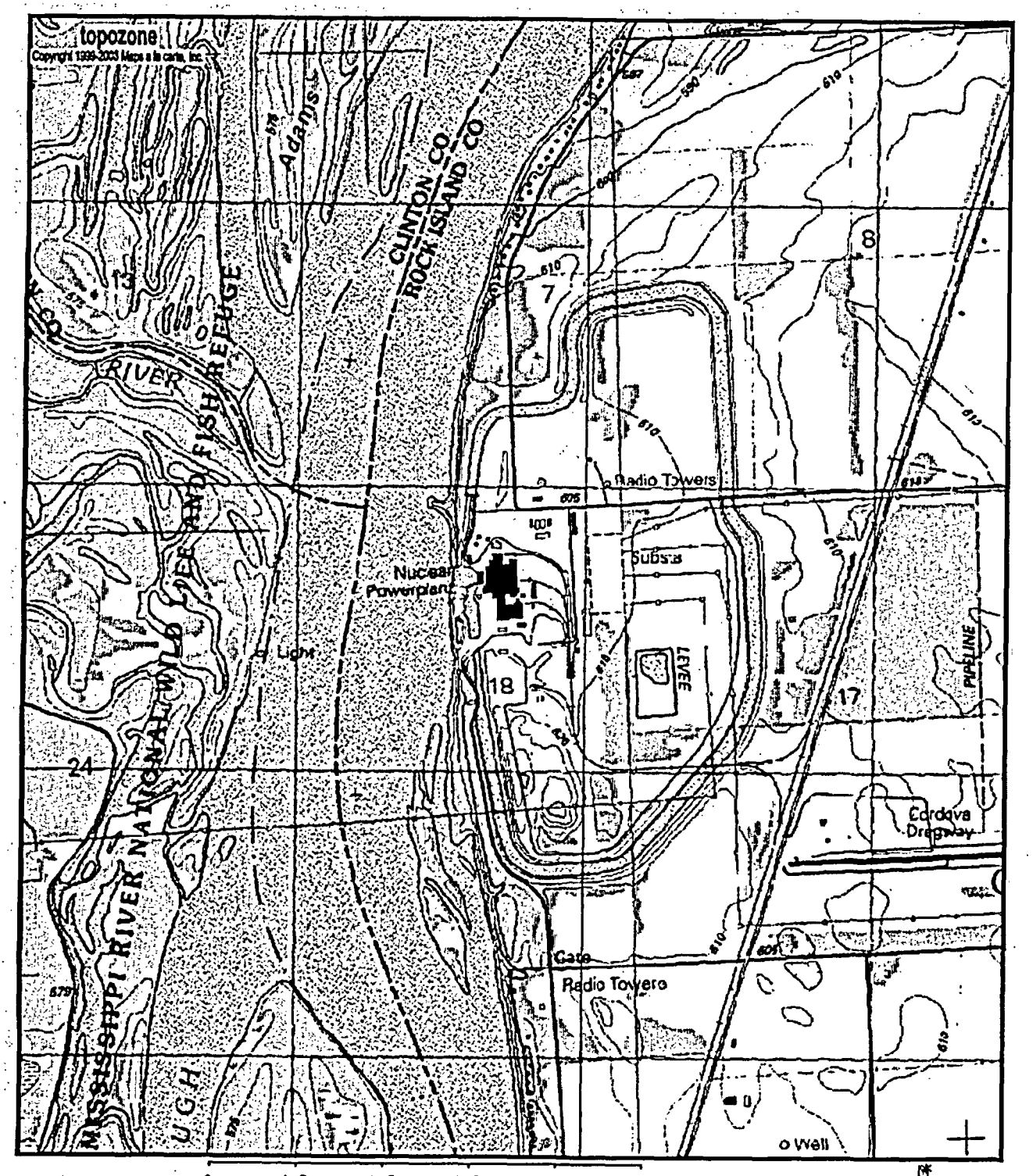
Run No. 1 Description: PAVAN X/Q analysis of the Control Room, EAB and LPZ consistent with Regulatory Guide 1.194 and Regulatory Guide 1.145.

Analysis Description: PAVAN calculations of X/Q are performed for the Control Room, EAB and outer LPZ distances. Maximum 0-2 hour, 0-8 hour, and 8 –24 hour, 1-4 day and 4-30 day X/Q values are computed for each direction sector; and the 5th percentile overall site X/Q is also calculated. The higher value is selected.

The attached computer output has been reviewed, the input data checked,
And the results approved for release. Input criteria for this analysis were established.

By:	On:
Run by: T.Thomas	8/5/2005
Checked by: J. Robinson	8/5/2005
Approved by: H. Rothstein	8/5/2005

Remarks: WGI Form for Computer Software Control



0 0.3 0.6 0.9 1.2 1.5 km

0 0.2 0.4 0.6 0.8 1 mi

M
G

Map center is 41.7260°N, 90.3100°W (WGS84/NAD83)
Cordova quadrangle - Elevation 592.9 ft / 180.7 m (USGS NED)
Projection is UTM Zone 15 NAD83 Datum

M=-0.693
G=1.792

Map obtained from http://www.topozone.com/map.asp?lat=41.726&lon=-90.31&datum=nad83&u=5

ATTACHMENT 18

DNPS Plant Parameters Tables

Dresden Nuclear Power Station (DNPS) Plant Parameters Tables

(Includes Changes Made Since October 10, 2002, Submittal)

Table 1:	**Dresden General Parameters and Methods Applicable to Design Basis Accidents**	**Page 2**
Table 2:	**Dresden Parameters and Methods Applicable to LOCA**	**Page 6**
Table 3:	**Dresden Parameters and Methods Applicable to Suppression Pool pH Transient Analysis**	**Page 9**
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Table 5:	**Dresden Parameters and Methods Applicable to the Main Steam Line Break (MSLB) Accident**	**Page 13**
Table 6:	**Dresden Parameters and Methods Applicable to the Fuel Handling Accident (FHA)**	**Page 15**
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Table 9:	**Summary of Dresden LOCA Dose Re-Analysis**	**Page 24**
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Table 1: Dresden General Parameters and Methods Applicable to Design Basis Accidents

General AST Analysis Parameter or Method	Currently Licensed Value or Method	Value or Method Submitted in October 10, 2002, AST Application	Final Supplemented Value or Method Used in AST Analysis	Justification for Change
Core Power Level	3016 MWth (current) 100% power is 2957 MWth, 102% power with RG 1.49 instrument uncertainty allowance is 3016 MWth.	3016 MWth (current) 100% power is 2957 MWth, 102% power with RG 1.49 instrument uncertainty allowance is 3016 MWth.	3016 MWth (current) 100% power is 2957 MWth, 102% power with RG 1.49 instrument uncertainty allowance is 3016 MWth.	No changes
Core Source Terms	TID-14844	ORIGEN2-based inventory. Includes the 60 isotopes in the standard RADTRAD library.	ORIGEN2-based inventory. Includes the 60 isotopes in the standard RADTRAD library.	No changes since 10/10/02 submittal. TID-14844 continues to be used for Equipment Qualification purposes.
Dose Conversion Factors for Thyroid Inhalation, Whole Body, and TEDE Dose	Thyroid – TID-14844 Whole Body – TID-14844 TEDE – N/A	Federal Guidance Reports 11 & 12 (RADTRAD input file) (TEDE only)	Federal Guidance Reports 11 & 12 (RADTRAD input file) (TEDE only)	RG 1.183 No changes since 10/10/02 submittal.
Distance to EAB	800 meters	800 meters	800 meters	No changes
EAB Dispersion Factors – Elevated Release (LOCA) 0 – 0.5 hr 0.5 – 2 hr	N/A – New X/Qs needed for AST	(sec/m^3) 6.98E-05 3.59E-06	(sec/m^3) 8.74E-05 6.74E-06	(PAVAN) Changed from currently licensed for AST. New design analysis as supplemented on November 5, 2004, and this supplement after revision with historic terrain data included per NRC RAI dated 7/22/05.
EAB Dispersion Factors – Ground Level Release (LOCA) 0 – 2 hr	N/A – New X/Qs needed for AST	(sec/m^3) 2.02E-04	(sec/m^3) 2.51E-04	(PAVAN) Changed from currently licensed for AST. New design analysis as supplemented on November 5, 2004, and this supplement MSLB, CRDA, & FHA X/Qs are listed in the Tables associated with these accidents.

Table 1: Dresden General Parameters and Methods Applicable to Design Basis Accidents

General AST Analysis Parameter or Method	Currently Licensed Value or Method	Value or Method Submitted in October 10, 2002, AST Application	Final Supplemented Value or Method Used in AST Analysis	Justification for Change
Distance to LPZ	8000 meters	8000 meters	8000 meters	No changes
LPZ Dispersion Factors – Elevated Release (LOCA) 0 – 0.5 hr 0.5 – 2 hr 2 – 8 hr 8 – 24 hr 1 – 4 day 4 – 30 day	N/A – New X/Qs needed for AST	(sec/m^3) 8.72E-06 2.48E-06 1.17E-06 8.08E-06 3.58E-07 1.12E-07	(sec/m^3) 8.84E-06 1.78E-06 8.50E-07 5.87E-07 2.63E-07 8.31E-08	(PAVAN) Changed from currently licensed for AST. New design analysis as supplemented on November 5, 2004, and this supplement.
LPZ Dispersion Factors – Ground Level Release (LOCA) 0 – 2 hr 2 – 8 hr 8 – 24 hr 1 – 4 day 4 – 30 day	N/A – New X/Qs needed for AST	(sec/m^3) 2.10E-05 9.08E-06 5.98E-06 2.41E-06 6.56E-07	(sec/m^3) 2.63E-05 1.09E-05 7.02E-06 2.70E-06 6.86E-07	(PAVAN, RG 1.194) Changed from currently licensed for AST. New design analysis as supplemented on November 5, 2004, and this supplement with downwash included per NRC RAI dated 7/22/05.
CR Dispersion Factors – Elevated Release (LOCA) 0 — 2 hr 2 – 8 hr 8 – 24 hr 1 – 4 day 4 – 30 day	N/A – New X/Qs needed for AST	(sec/m^3) 1.41E-08 5.57E-09 3.50E-09 1.28E-09 3.01E-10	(sec/m^3) 6.42E-06 2.87E-06 1.92E-06 8.03E-07 2.29E-07	(PAVAN, RG 1.194) Changed from currently licensed for AST. New design analysis as supplemented on November 5, 2004, and this supplement with downwash included per NRC RAI dated 7/22/05.
CR Dispersion Factors – Ground Level Release via MSIVs (LOCA) 0 – 2 hr 2 – 8 hr 8 – 24 hr 1 – 4 day 4 – 30 day	N/A – New X/Qs needed for AST	(sec/m^3) 1.24E-03 1.08E-03 5.29E-04 3.43E-04 2.72E-04	(sec/m^3) 1.30E-03 1.06E-03 4.49E-04 2.96E-04 2.44E-04	(ARCON96, RG 1.194) Changed from currently licensed for AST. New design analysis as supplemented on November 5, 2004, and this supplement.

Table 1: Dresden General Parameters and Methods Applicable to Design Basis Accidents

General AST Analysis Parameter or Method	Currently Licensed Value or Method	Value or Method Submitted in October 10, 2002, AST Application	Final Supplemented Value or Method Used In AST Analysis	Justification for Change
CR Dispersion Factors – Ground Level Release MSIV (CRDA) 0 – 10 min 10 min – 2 hr 2 – 8 hr 8 – 24 hr	N/A – New X/Qs needed for AST	(sec/m^3) 4.17E-04 1.24E-03 1.08E-03 5.29E-04	(sec/m^3) 1.30E-03 1.30E-03 1.06E-04 4.49E-04	(ARCON96, RG 1.194) Changed from currently licensed for AST. New design analysis as supplemented on November 5, 2004, and this supplement.
Control Room Volume	81,000 ft^3 (Emergency Zone)	81,000 ft^3 (Emergency Zone)	81,000 ft^3 (Emergency Zone)	No changes
CREV System Initiation (Manual)	40 minutes after LOCA initiation	40 minutes after LOCA initiation	40 minutes after LOCA initiation	No changes During this 40-minute period for manual operator action, the normal mode of the CR HVAC system operation is assumed. A Technical Evaluation was performed that demonstrated up to 60,000 cfm of unfiltered air intake/inleakage into the CR during this period will result in acceptable CR operator doses over the 30-day accident period. Section 5.1.2 of the revised LOCA calculation erroneously states "the single active component failures modeled in this calculation are the MSIV in one main steam line failing to close and the operation of the CREV system failing to start by Safety Injection signal." Although the CREV does not automatically initiate, the system will alarm on a high radiation signal, thereby allowing operators to manually initiate the system within 40

Table 1: Dresden General Parameters and Methods Applicable to Design Basis Accidents				
General AST Analysis Parameter or Method	**Currently Licensed Value or Method**	**Value or Method Submitted in October 10, 2002, AST Application**	**Final Supplemented Value or Method Used in AST Analysis**	**Justification for Change**
				minutes. EGC has initiated actions to remove the reference to the "Safety Injection signal." The correction to the calculation does not alter the results of the analyses.
Filtered Intake Rate - CREV Mode	2,000 cfm +/- 10%	2,000 cfm +/- 10%	2,000 cfm - 10%	No changes
CR Intake Filter Efficiency	99% for all Iodines	97% for all Iodines	99% for all Iodines	Changed back to currently licensed value. The decision to change back to the currently licensed value for intake filter efficiency is based on results of the 7/14/05 meeting between NRC and EGC to reflect the guidance in RG 1.52.
CR Unfiltered Inleakage	263 cfm, including 10 cfm for ingress/egress	600 cfm, including 10 cfm for ingress/egress	400 cfm, including 10 cfm for ingress/egress	Supported by design basis analysis and previous tracer gas testing.

Table 2: Dresden Parameters and Methods Applicable to LOCA

LOCA AST Analysis Parameter or Method	Currently Licensed Value or Method	Value or Method Submitted in October 10, 2002, AST Application	Final Supplemented Value or Method Used in AST Analysis	Justification for Change
Releases to Containment	TID-14844 Instantaneous release into containment at T = 0	No Core Activity Release for first 2 minutes. Release Fractions and Timing per NUREG-1465	No Core Activity Release for first 2 minutes. Release Fractions and Timing per NUREG-1465	RG 1.183 No changes since 10/10/02 submittal.
Natural Deposition in Containment	TID-14844	Power's algorithm built into RADTRAD 10 percentile value	Powers' algorithm built into RADTRAD 10 percentile value	No changes since 10/10/02 submittal.
Containment Spray Removal Mechanism	Not credited	Not credited	Not credited	No changes
Containment Volume	1.58E+05 ft^3	1.58E+05 ft^3	1.58E+05 ft^3 (0 – 2 hours) 2.78E+05 ft^3 (2 – 720 hours)	Supported by design basis analysis.
Drywell Surface Area	32,250 ft^3	32,250 ft^3	32,250 ft^3	No changes
Minimum Suppression Pool water volume	110,000 ft^3	110,000 ft^3	110,000 ft^3	No changes
Primary Containment Total Leak Rate, Including MSIV Leakage	1.6% volume per day	3.0% per day for first 24 hours (L_a); 1.5% per day thereafter	3.0% per day (L_a) 0 to 30 days	Supported by design basis analysis. No reduction taken after 24 hours per design analysis and this supplement.
Aerosol Natural Deposition Coefficients Used in the Containment	TID-14844	Credit is taken for natural deposition of aerosols based on equations for the Power's model in NUREG/CR 6189 and input directly into RADTRAD as natural deposition time dependent lambdas. No credit is assumed for natural deposition of elemental or organic iodine, or for suppression pool scrubbing.	Credit is taken for natural deposition of aerosols based on equations for the Power's model in NUREG/CR 6189 and input directly into RADTRAD as natural deposition time dependent lambdas. No credit is assumed for natural deposition of elemental or organic iodine, or for suppression pool scrubbing.	No changes since 10/10/02 submittal. Containment aerosol deposition per RADTRAD Power Model using 10% uncertainty. Elemental iodine deposition per SRP 6.5.2.

Table 2: Dresden Parameters and Methods Applicable to LOCA

LOCA AST Analysis Parameter or Method	Currently Licensed Value or Method	Value or Method Submitted in October 10, 2002, AST Application	Final Supplemented Value or Method Used in AST Analysis	Justification for Change
Main Steam Line and Condenser Holdup Credit for MSIV Leakage	N/A	No credit is taken for holdup and plate-out downstream of the outboard MSIVs or in the condenser since these components have not been evaluated for seismic ruggedness.	No credit is taken for holdup and plate-out downstream of the outboard MSIVs or in the condenser since these components have not been evaluated for seismic ruggedness.	No changes
MSIV leak rate	79 scfh @ 48 psig total in all 4 lines	250 scfh (100 scfh assumed for the two shortest lines) 125 scfh after 24 hours Leading edge of MSIV leakage assumed to exit main steam line at T = 40 minutes.	150 scfh (60 scfh maximum for any one line)	Supported by design basis analysis. No reduction taken after 24 hours per this supplement Supercedes response to NRC Request 6 in September 15, 2003, supplement.
Deposition/Plateout	N/A	Modified AEB 98-03 method	AEB 98-03 well-mixed flow is now assumed. (See attached Table 7 for AEB 98-03 Parameters and details).	Supported by design basis analysis.
Secondary Containment Volume	4.5E+06 ft^3	4.5E+06 ft^3	4.5E+06 ft^3	No changes
Fraction of Secondary Containment Available for Mixing	0.5	0.5	0.5	No changes
Secondary Containment Drawdown Time	N/A	N/A	N/A	No changes
Standby Gas Treatment (SGT) System flow rate	4000 cfm + 10% = 4400 cfm	4000 cfm + 10% = 4400 cfm	4000 cfm + 10% = 4400 cfm	No changes
SGT System Filter Efficiency Aerosol/Particulate: Elemental Iodine: Organic Iodine:	 99% 95% 95%	 99% 50% 50%	 99% 50% 50%	Reverted back to the currently licensed TS values.

Table 2: Dresden Parameters and Methods Applicable to LOCA				
LOCA AST Analysis Parameter or Method	**Currently Licensed Value or Method**	**Value or Method Submitted in October 10, 2002, AST Application**	**Final Supplemented Value or Method Used in AST Analysis**	**Justification for Change**
			Although TS limit is 95%, 50% efficiency is used for elemental and organic iodine in analysis for conservatism.	
ECCS Leakage into Secondary Containment Leak Rate	10 gph	2 gpm (2 times the maximum allowable admin limit of 1 gpm)	2 gpm (2 times the maximum allowable admin limit of 1 gpm)	Supported by design analysis.
ECCS Fraction Flashed	10%	10%	10%	No changes
ECCS Leakage Filtered by SGT System	Yes	Yes	Yes	No changes
Leakage Duration	0 – 30 days	0 – 30 days	0 – 30 days	No changes
Control Room Operator Shine Dose (LOCA)	Shine dose includes TID-14844 isotopes	Shine dose includes TID-14844 isotopes (Same dose assumed for conservatism)	Shine dose includes RG 1.183 isotopes	Supported by design basis analysis. Shine doses using the 60-isotope library (i.e., RG 1.183 isotopes) from the RADTRAD computer code were calculated in response to an NRC RAI dated August 19, 2004.

Table 3: Dresden Parameters and Methods Applicable to Suppression Pool pH Transient Analysis

Suppression Pool pH Transient AST Analysis Parameter or Method	Currently Licensed Value or Method	Value or Method Submitted in October 10, 2002, AST Application	Final Supplemented Value or Method Used in AST Analysis	Justification for Change
Maximum Suppression Pool Water Volume	119,800 ft3 at 95°F	119,800 ft^3 at 95°F	119,800 ft^3 at 95°F	No changes
Maximum Reactor Coolant Mass	590,000 lb	590,000 lb	590,000 lb	No changes
Maximum Volume of Water Pumped Into Containment Post-LOCA	10,000 ft3 at 95°F	10,000 ft^3 at 95°F	10,000 ft^3 at 95°F	No changes
Minimum Mass of Sodium Pentaborate Delivered Within 100 minutes Post-LOCA	3769.4 lb	3769.4 lb	3769.4 lb	No changes
Maximum Volume of Sodium Pentaborate Solution Delivered	3253.4 gal	3253.4 gal	3253.4 gal	No changes
Maximum Cable Mass in Conduit including jacket, insulation, and fillers (70% of total)	17,250 lb	17,250 lb	17,250 lb	No changes
Maximum Cable Mass not in Conduit including jacket, insulation, and fillers (30% of total)	5750 lb	5750 lb	5750 lb	No changes
Integrated worst-case 30-day post-LOCA beta dose in the containment atmosphere	1700 Mrads	1700 Mrads	1700 Mrads	No changes
Integrated worst-case 30-day post-LOCA gamma dose in the containment atmosphere	98.1 Mrads	98.1 Mrads	98.1 Mrads	No changes
Total integrated worst-case 30-day post-LOCA dose (gamma + beta) in the suppression pool	52.4 Mrads	52.4 Mrads	52.4 Mrads	No changes
Minimum ECCS flow rate from suppression pool	4500 gpm per pump	4500 gpm per pump	4500 gpm per pump	No changes

Table 3: Dresden Parameters and Methods Applicable to Suppression Pool pH Transient Analysis

Suppression Pool pH Transient AST Analysis Parameter or Method	Currently Licensed Value or Method	Value or Method Submitted in October 10, 2002, AST Application	Final Supplemented Value or Method Used in AST Analysis	Justification for Change
Standby Liquid Control (SLC) system credit	SLC system not credited for pH control	Credited for pH control. Full sodium pentaborate injection into suppression pool within several hours of accident initiation and pool is well mixed	Credited for pH control. Full sodium pentaborate injection into suppression pool within several hours of accident initiation and pool is well mixed	SLC system credited per 10/10/02 submittal. No change since 10/10/02 submittal.
Iodine Re-evolution from Containment Liquids (none if pH maintained above 7)	N/A – Not required for TID-14844	None. Suppression pool pH stays at 7 or above during entire accident.	None. Suppression pool pH stays at 7 or above during entire accident.	New design basis analysis performed for the 10/10/02 submittal. No change since 10/10/02 submittal.

Table 4: Dresden Parameters and Methods Applicable to CRDA

CRDA AST Analysis Parameter or Method	Currently Licensed Value or Method	Value or Method Submitted in October 10, 2002, AST Application	Final Supplemented Value or Method Used in AST Analysis	Justification for Change
Damaged Fuel Releases to Reactor Coolant	850 fuel rods failed - (45,612 fuel rods in core)	850 fuel rods failed - (45,612 fuel rods in core)	850 fuel rods failed - (45,612 fuel rods in core)	No changes
Fraction of failed fuel that melts	0.77% Value used in NEDO-31400A (Section 2.1, Page 2)	0.77% Value used in NEDO-31400A (Section 2.1, Page 2)	0.77% Value used in NEDO-31400A (Section 2.1, Page 2)	No changes
Fuel Bundles in Core	724	724	724	No changes
Fuel peaking factor	1.7	1.7	1.7	No changes
Radioactivity transport pathway	Carryover with steam to condenser prior to MSIV closure and leakage from condenser to the environment	Carryover with steam to condenser prior to MSIV closure and leakage from condenser to the environment	Carryover with steam to condenser prior to MSIV closure and leakage from condenser to the environment	No changes
Fuel released activity carried to condenser before MSIV complete closure	Noble Gases 100% Iodines 10% Remaining radionuclides 1%	Noble Gases 100% Iodines 10% Remaining radionuclides 1%	Noble Gases 100% Iodines 10% Remaining radionuclides 1%	No changes
Charcoal Delay Bed Noble Gas Delay for SJAE Pathway	14.6 days for Xe 19.4 hrs for Kr	14.6 days for Xe 19.4 hrs for Kr	14.6 days for Xe 19.4 hrs for Kr	No changes
CREV System Initiation	Not credited	Not credited	Not credited	No changes
Activity in condenser release to environment	Noble Gases 100% Iodines 10% Remaining radionuclides 1%, with released Iodine species as follows: 97% elemental and 3% organic	Noble Gases 100% Iodines 10% Remaining radionuclides 1%, with released Iodine species as follows: 97% elemental and 3% organic	Noble Gases 100% Iodines 10% Remaining radionuclides 1%, with released Iodine species as follows: 97% elemental and 3% organic	No changes
Airborne condenser activity leakrate to environment	1% per day for 24 hours, then 0.	1% per day for 24 hours, then 0.	1% per day for 24 hours, then 0.	No changes
Credit for activity decay during condenser residence	Yes	Yes	Yes	No changes

Table 4: Dresden Parameters and Methods Applicable to CRDA

CRDA AST Analysis Parameter or Method	Currently Licensed Value or Method	Value or Method Submitted in October 10, 2002, AST Application	Final Supplemented Value or Method Used in AST Analysis	Justification for Change
Credit for activity decay after release to environment	No	No	No	No changes
Credit for accident termination features	Yes, isolation of Mechanical Vacuum Pumps by main steam line rad monitors upon CRDA initiation.	Yes, isolation of Mechanical Vacuum Pumps by main steam line rad monitors upon CRDA initiation.	Yes, isolation of Mechanical Vacuum Pumps by main steam line rad monitors upon CRDA initiation.	No changes
Credit for Holdup in Turbine Building	No	No	No	No changes
Condenser Volume (vapor space)	55,000 ft^3	55,000 ft^3	55,000 ft^3	No changes
Atmospheric Dispersion	N/A – New X/Qs calculated for AST	See Table 1	See Table 1	X/Q values changed per design analysis in supplement dated November 5, 2004, and this supplement.

Table 5: Dresden Parameters and Methods Applicable to the Main Steam Line Break (MSLB) Accident

MSLB AST Analysis Parameter or Method	Currently Licensed Value or Method	Value or Method Submitted in October 10, 2002, AST Application	Final Supplemented Value or Method Used in AST Analysis	Justification for Change
MSIV closure time	5.5 seconds	5.5 seconds	5.5 seconds	No changes
Break Characteristic and Coolant Release Discharged mass	96,250 lb (53,750 lb liquid and 42,500 lb steam)	96,250 lb (53,750 lb liquid and 42,500 lb steam)	140,000 lb liquid (no steam) (40% flashing)	This change ensures that the discharged mass is maximized (conservative application of SRP 15.6.4, Paragraph III.2.a). The value of 140,000 lb liquid is only used for control room and offsite dose analysis. The values for coolant released listed in the current license basis remain the basis for no fuel damage.
Release characteristics	All the radioactivity in the released coolant is assumed to be released to the atmosphere instantaneously as a ground level release. No credit is assumed for plateout, holdup, or dilution within facility buildings.	All the radioactivity in the released coolant is assumed to be released to the atmosphere instantaneously as a ground level release. No credit is assumed for plateout, holdup, or dilution within facility buildings.	All the radioactivity in the released coolant is assumed to be released to the atmosphere instantaneously as a ground level release. No credit is assumed for plateout, holdup, or dilution within facility buildings.	No changes
Amount of Fuel Damage Projected	None	None	None	No changes
Analyzed Cases and Activity Releases	Two cases analyzed, one without and one with postulated iodine spike, using TS reactor coolant activity limits and reactor coolant iodine activity concentrations. Maximum equilibrium value 0.2 uCi/gm	Two cases analyzed, one without and one with postulated iodine spike, using TS reactor coolant activity limits and reactor coolant iodine activity concentrations. Maximum equilibrium value 0.2 uCi/gm	Two cases analyzed, one without and one with postulated iodine spike, using TS reactor coolant activity limits and reactor coolant iodine activity concentrations. Maximum equilibrium value 0.2 uCi/gm	The activity of the cloud is based on the total mass of water released from the break.

Table 5: Dresden Parameters and Methods Applicable to the Main Steam Line Break (MSLB) Accident

MSLB AST Analysis Parameter or Method	Currently Licensed Value or Method	Value or Method Submitted in October 10, 2002, AST Application	Final Supplemented Value or Method Used in AST Analysis	Justification for Change
	Pre-accident spike activity 4.0 uCi/gm	Pre-accident spike activity 4.0 uCi/gm	Pre-accident spike activity 4.0 uCi/gm Noble gas and cesium activities are now considered in addition to iodine.	NRC RAI question received July 22, 2005, required the addition of noble gas and cesium activity to be considered in the dose consequence analysis.
Iodine Species Released	RG 1.5	95% CsI as aerosol 4.85% elemental 0.15% organic	95% CsI as aerosol 4.85% elemental 0.15% organic	RG 1.183 No changes since 10/10/02 submittal.
Atmospheric Dispersion EAB: LPZ:	N/A Updated for AST Updated for AST	(sec/m^3) 4.40E-04 5.50E-05	(sec/m^3) 4.40E-04 5.50E-05	No changes since 10/10/02 submittal. Used method described in RG 1.5.

Table 6: Dresden Parameters and Methods Applicable to the Fuel Handling Accident (FHA)				
FHA AST Analysis Parameter or Method	**Currently Licensed Value or Method**	**Value or Method Submitted in October 10, 2002, AST Application**	**Final Supplemented Value or Method Used in AST Analysis**	**Justification for Change**
Minimum time after shutdown required before movement of recently irradiated fuel	24 hours	24 hours	24 hours	No changes
Fuel bundle peak burnup	N/A	Not to exceed 62 GWD/MTU.	Not to exceed 62 GWD/MTU.	No changes since 10/10/02 submittal.
Maximum linear heat generation rate.	N/A	6.3 kw/ft average power for fuel exceeding 54 GWD/MTU	6.3 kw/ft average power for fuel exceeding 54 GWD/MTU	RG 1.183 No changes since 10/10/02 submittal.
Spent fuel source terms are based on reactor core source terms for LOCA	TID-14844	ORIGEN2-based inventory. Includes the 60 isotopes in the standard RADTRAD library (same as for LOCA).	ORIGEN2-based inventory. Includes the 60 isotopes in the standard RADTRAD library (same as for LOCA).	Supported by design basis analysis. No changes since 10/10/02 submittal.
Radial Peaking Factor	1.5	1.7	1.7	Supported by design basis analysis. No changes since 10/10/02 submittal.
Bounding Analyzed Water Depths above damaged fuel	19 feet	19 feet This value corresponds to the minimum expected coverage over spent fuel racks, and the Technical Specification 3.7.8 limit. It provides assurance that analyzed coverage accounts for potential dropped fuel that might be positioned lying over the spent fuel racks.	19 feet This value corresponds to the minimum expected coverage over spent fuel racks, and the Technical Specification 3.7.8 limit. It provides assurance that analyzed coverage accounts for potential dropped fuel that might be positioned lying over the spent fuel racks.	Supported by design basis analysis. No changes since 10/10/02 submittal.
Accident Release Duration	2 hours	2 hours Activity reaching the refuel floor airspace will effectively be all (99.97%) exhausted	2 hours Activity reaching the refuel floor airspace will effectively be all (99.97%) exhausted within two	No changes since 10/10/02 submittal.

Table 6: Dresden Parameters and Methods Applicable to the Fuel Handling Accident (FHA)

FHA AST Analysis Parameter or Method	Currently Licensed Value or Method	Value or Method Submitted in October 10, 2002, AST Application	Final Supplemented Value or Method Used in AST Analysis	Justification for Change
		within two hours by using an artificially high exhaust rate. This also provides an allowance for uneven mixing in the refuel floor airspace.	hours by using an artificially high exhaust rate. This also provides an allowance for uneven mixing in the refuel floor airspace.	
Exhaust pathway	Filtration through SGT system as elevated release	Through the normal exhaust to the Reactor Building Exhaust Stack. No credit is taken for filtration by the SGT system, or resulting elevated release through the station chimney.	Through the normal exhaust to the Reactor Building Exhaust Stack. No credit is taken for filtration by the SGT system, or resulting elevated release through the station chimney.	Supported by design basis analysis. No changes since 10/10/02 submittal.
Credit for operation of CREV	Credited	No credit is taken for the operation of the CREV during the FHA. Normal intake and outflow are credited.	No credit is taken for the operation of the CREV during the FHA. Normal intake and outflow are credited.	Supported by design basis analysis. No changes since 10/10/02 submittal.
Fuel Assembly Configuration	7x7 in a 49-pin bundle	7x7 in a 49-pin bundle	7x7 in a 49-pin bundle	No changes
Number of Pins Damaged	111 total pins damaged (bounding).	111 total pins damaged (bounding).	111 total pins damaged (bounding).	No changes
FHA Radionuclide Inventory	Based on Appendix D of GENE-A22-00103-64-01, Task Report T0802, Rev. 0, "Radiation Sources and Fission Products."	Based on Appendix D of GENE-A22-00103-64-01, Task Report T0802, Rev. 0, "Radiation Sources and Fission Products", for the 60 isotopes forming the standard RADTRAD library, with decay to 24 hours. Gap activities are per R.G. 1.183.	Based on Appendix D of GENE-A22-00103-64-01, Task Report T0802, Rev. 0, "Radiation Sources and Fission Products", for the 60 isotopes forming the standard RADTRAD library, with decay to 24 hours. Gap activities are per R.G. 1.183.	No changes since 10/10/02 submittal.
Underwater Decontamination Factor	Iodine DF = 100	Iodine DF = 135, corresponding to a 19-ft water depth	Iodine DF = 135, corresponding to a 19-ft water depth	Supported by design basis analysis and RG 1.183.

Table 6: Dresden Parameters and Methods Applicable to the Fuel Handling Accident (FHA)				
FHA AST Analysis Parameter or Method	**Currently Licensed Value or Method**	**Value or Method Submitted in October 10, 2002, AST Application**	**Final Supplemented Value or Method Used in AST Analysis**	**Justification for Change**
	Noble Gas DF = 1 Particulate DF = infinity	Noble Gas DF = 1 Particulates (cesiums and rubidiums) DF = infinity	Noble Gas DF = 1 Particulates (cesiums and rubidiums) DF = infinity	No changes since 10/10/02 submittal.
Iodine chemical distribution	97% Elemental 3% organic	95% CsI, instantaneously dissociating in the pool water and re-evolving as elemental iodine, unless the pH of the pool water is justified mechanistically to be above 7; 4.8 5% elemental; 0.15% organic	95% CsI, instantaneously dissociating in the pool water and re-evolving as elemental iodine, unless the pH of the pool water is justified mechanistically to be above 7; 4.8 5% elemental; 0.15% organic	RG 1.183 No changes since 10/10/02 submittal.
Secondary Containment automatic isolation and filtration	Credited	Not credited for all fuel with 24 hours decay.	Not credited for all fuel with 24 hours decay.	Supported by design basis analysis. RG 1.183, TSTF-51 No changes since 10/10/02 submittal.
Mitigation by CREV system	Credited	Not credited for all fuel with 24 hours decay	Not credited for all fuel with 24 hours decay	No changes since 10/10/02 submittal.
Normal and Emergency Control Room fresh air makeup rate	Design Basis Intake 2000 cfm + 10% uncertainty + 600 cfm inleakage	Design Basis Intake 2000 cfm + 10% uncertainty + 600 cfm unfiltered inleakage. 4000 cfm used for conservatism and to allow for possible additional inleakage due to CR envelope maintenance during refueling outages.	64,000 cfm used for conservatism.	Supported by design basis analysis. No changes since 10/10/02 submittal.

Table 6: Dresden Parameters and Methods Applicable to the Fuel Handling Accident (FHA)

FHA AST Analysis Parameter or Method	Currently Licensed Value or Method	Value or Method Submitted in October 10, 2002, AST Application	Final Supplemented Value or Method Used in AST Analysis	Justification for Change
Refuel Floor Normal Ventilation rate and volume	Secured upon initiation of SGT system	Approximately 4 air changes per hour and 4,500,000 ft^3 (Total Reactor Building Volume)	Approximately 4 air changes per hour and 4,500,000 ft^3 (Total Reactor Building Volume)	Supported by design basis analysis. No changes since 10/10/02 submittal.
CR Worst Case Release Point Basis Dispersion Factors 0 – 2 hr	SGT system (elevated)	Normal RB exhaust stack (ground level, unfiltered) 6.44E-04 sec/m^3	Normal RB exhaust stack (ground level, unfiltered) 6.44E-04 sec/m^3	Supported by design basis analysis. No changes since 10/10/02 submittal.
EAB Worst Case Release Point Basis Dispersion Factors 0 – 2 hr	SGT system (elevated)	Normal RB exhaust stack (ground level, unfiltered) 7.87E-04 sec/m^3	Normal RB exhaust stack (ground level, unfiltered) 2.51E-04 sec/m^3	Supported by design basis analysis.
LPZ Worst Case Release Point Basis Dispersion Factors 0 – 2 hr	SGT system (elevated)	Normal RB exhaust stack 4.69E-05 sec/m^3	Normal RB exhaust stack 2.63E-05 sec/m^3	Supported by design basis analysis.

Table 7: Dresden AEB 98-03 Parameters and Methods Used for MSIV Leakage Analysis

AEB 98-03 Parameters and Methods	Final Supplemented Value or Method Used In AST Analysis	Justification
MSIV Leakage Distribution	40% in MS Line A (Shortest line) 40% in MS Line D (2nd shortest line) 20% in MS Line C (3rd shortest line) 0% in MS Line B (4th shortest line)	Leakage limits are 150 scfh total, and 60 scfh for any one line. Maximizing flow through shorter lines minimizes piping deposition credit.
Nodalization for AEB 98-03 well mixed modeling; Single Active Failure Assumptions	Two-node treatment is used for each steam line in which flow occurs. The first node is from the reactor vessel to the inboard MSIV. The second node is from the inboard MSIV to the outboard MSIV.	Inboard MSIV failure is selected. The aerosol and elemental iodine depositions are not credited in the "faulted" steam line between the RPV nozzle and inboard MSIV.
Inboard Piping Volumes and Surface Areas	For Aerosol Settling LINE / Vol (ft^3) / Area(ft^2) MS A / 40.0 / 34.54 MS D / 39.97 / 34.52 MS C / 49.01 / 42.33 For Elemental Iodine Deposition, a DF of 2 or elemental removal efficiency of 50% is used per AEB 98-03, Appendix B	Aerosol deposition includes horizontal projected piping surface area. Only horizontal piping volumes are used in the aerosol deposition analysis. The mechanism for elemental iodine removal is due to chemical adsorption and is independent of surface orientation. Therefore, consideration of vertical piping is appropriate.
Outboard Piping Volumes and Surface Areas	For Aerosol Settling LINE / Vol (ft^3) / Area(ft^2) MS A / 47.28 / 40.83 MS D / 49.11 / 42.41 MS C / 49.11 / 42.41 For Elemental Iodine Deposition, a DF of 2 or elemental removal efficiency of 50% is used per AEB 98-03, Appendix B	Aerosol deposition includes horizontal projected piping surface area. Only horizontal piping volumes are used in the aerosol deposition analysis. The mechanism for elemental iodine removal is due to chemical adsorption and is independent of surface orientation. Therefore, consideration of vertical piping is appropriate.

Table 7: Dresden AEB 98-03 Parameters and Methods Used for MSIV Leakage Analysis

AEB 98-03 Parameters and Methods	Final Supplemented Value or Method Used in AST Analysis	Justification
Associated Containment Leak Rate	Leak Rates LINE (scfh) (cfh) (cfm) MS A 60 60 1.0 MS D 60 60 1.0 MS C 30 30 0.5	Total MSIV leakage measured @ 48 psig = 150 scfh
Drywell MSIV leakage to Inboard Piping Node (0-2 hrs)	Leak Rates LINE (cfh) (cfm) MS A 21.41 0.357 MS D 21.41 0.357 MS C 10.70 0.175	Values are as determined based on the total MSIV leak rate.
Drywell MSIV leakage to Inboard Piping Node (2-720 hrs) (Drywell + suppression pool air space)	Leak Rates LINE (cfh) (cfm) MS A 12.58 0.210 MS D 12.58 0.210 MS C 6.28 0.105	Values are as determined based on the total MSIV leak rate.
Outboard Piping Node Flow Rate (0-720 hrs) (Drywell + suppression pool air space)	Leak Rates LINE (cfh) (cfm) MS A 60 1.0 MS D 60 1.0 MS C 30 0.5	Values are conservatively expanded based on outside pressure with containment at P_a and Fluid Temperature at 291 °F for the accident duration, compared with standard conditions at 68 °F.
Leak Rate and flow rates after 24 hours	Leak rates and flow rates are conservatively not reduced after 24 hours.	
Seismic Design of Credited Piping	Credited piping is seismically designed and includes in-containment piping from the reactor vessel to the outboard MSIV.	

Table 8: Dresden Technical Specification Changes Since 10/10/02 Submittal (Affected Pages)			
Tech Spec Changes (Affected Pages)	**Tech Spec Changes Submitted in October 10, 2002, AST Application**	**Final Supplemented Tech Spec Changes**	**Justification for Change**
1.1-2		No change since 10/10/02 submittal.	
1.1-3	Reference to FGR-11 & 12 in definition of dose equivalent iodine	Clarified statement to remove the reference to FGR-12 Clarified use of inhalation committed dose conversion factors	Supplement dated September 15, 2003 Supplement dated September 22, 2004
3.1.7-1		No change since 10/10/02 submittal.	
3.3.6.1-7		No change since 10/10/02 submittal.	
3.3.6.2-4		No change since 10/10/02 submittal.	
3.3.7.1-1		No change since 10/10/02 submittal.	
3.6.1.3-9	Verify the leakage rate through each MSIV leakage path is </= 57 scfh when tested at >/= 25 psig, and the combined leakage rate for all MSIV leakage paths is </= 144 scfh when tested at >/= 25 psig.	Verify the leakage rate through each MSIV leakage path is </= 34 scfh when tested at >/= 25 psig, and the combined leakage rate for all MSIV leakage paths is </= 86 scfh when tested at >/= 25 psig.	Supported by design basis analysis per this supplement.
3.6.4.1-1		No change since 10/10/02 submittal.	
3.6.4.1-2		No change since 10/10/02 submittal.	
3.6.4.2-1		No change since 10/10/02 submittal.	
3.6.4.2-3		No change since 10/10/02 submittal.	

Table 8: Dresden Technical Specification Changes Since 10/10/02 Submittal (Affected Pages)			
Tech Spec Changes (Affected Pages)	**Tech Spec Changes Submitted in October 10, 2002, AST Application**	**Final Supplemented Tech Spec Changes**	**Justification for Change**
3.6.4.3-1		No change since 10/10/02 submittal.	
3.6.4.3-2		No change since 10/10/02 submittal.	
3.6.4.3-3		No change since 10/10/02 submittal.	
3.7.4-1		No change since 10/10/02 submittal.	
3.7.4-2		No change since 10/10/02 submittal.	
3.7.5-1		No change since 10/10/02 submittal.	
3.7.5-2		No change since 10/10/02 submittal.	
3.8.1-15		No change since 10/10/02 submittal.	
3.8.2-1		No change since 10/10/02 submittal.	
3.8.2-3		No change since 10/10/02 submittal.	
3.8.2-4		No change since 10/10/02 submittal.	
3.8.5-1		No change since 10/10/02 submittal.	
3.8.8-1		No change since 10/10/02 submittal.	
3.8.8-2		No change since 10/10/02 submittal.	

Table 8: Dresden Technical Specification Changes Since 10/10/02 Submittal (Affected Pages)			
Tech Spec Changes (Affected Pages)	**Tech Spec Changes Submitted in October 10, 2002, AST Application**	**Final Supplemented Tech Spec Changes**	**Justification for Change**
5.5-7	Change penetration test acceptance criteria for SGT system to 50% Change penetration test acceptance criteria for CREV System to 5%	Withdrawn – penetration criteria remains at 2.5% Withdrawn – penetration criteria remains at 0.5%	Supplement dated September 15, 2003
5.5-12		No change since 10/10/02 submittal.	

Table 9: Summary of Dresden LOCA Dose Re-Analysis			
EAB (rem TEDE)	LPZ (rem TEDE)	Control Room (DBA Case) (rem TEDE)	Dose Contributor
6.77E-02	7.53E-02	1.59E-02	Containment Leakage (max EAB dose occurs @ 4.1 hours)
2.85E-02	5.79E-02	3.24E-02	ESF Leakage (max EAB dose occurs @ 16 hours)
1.48E+00	3.68E-01	4.17E+00	MSIV Leakage (max EAB dose occurs at 2.9 hours)
N/A	N/A	2.20E-01	Containment Shine to CR
N/A	N/A	2.73E-01	External Cloud Shine to CR
N/A	N/A	Negligible	CR Filter Shine to CR
1.58	0.50	4.71	Total Calculated Value
25	25	5	Dose Limit

Table 10: Summary of Dresden MSLB Dose Re-Analysis			
EAB (rem TEDE)	LPZ (rem TEDE)	Control Room (DBA Case) (rem TEDE)	Analyzed Case
3.25E-02	4.06E-03	9.20E-02	Case 1: Normal Equilibrium of 0.2 μCi
6.46E-01	8.06E-02	1.84E+00	Case 2: Iodine Spike of 4.0 μCi
Case 1: 2.5 Case 2: 25	Case 1: 2.5 Case 2: 25	Case 1: 5 Case 2: 5	Dose Limits

Table 11: Summary of Dresden CRDA Dose Re-Analysis			
EAB (rem TEDE)	LPZ (rem TEDE)	Control Room (DBA Case) (rem TEDE)	Analyzed Case
1.32E-01	3.85E-02	3.00E+00	Main Condenser Leakage
2.63E-01	2.76E-02	1.01E+00	Gland Seal Condenser Leakage
2.92E-01	3.06E-02	5.44E-02	SJAE Releases
3.95E-01	6.61E-02	4.01E+00	Total Main and Gland Seal Condenser Leakage
5.55E-01	5.82E-02	1.06E+00	Total Gland Seal Condenser Leakage and SJAE Release
6.3	6.3	5	Dose Limits

Table 12: Summary of Dresden FHA Dose Re-Analysis			
EAB (rem TEDE)	LPZ (rem TEDE)	Control Room (DBA Case) (rem TEDE)	Analyzed Case
9.67E-01	1.01E-01	1.99E+00	With 19 feet Water Coverage
6.3	6.3	5	Dose Limits

ATTACHMENT 19

QCNPS Plant Parameters Tables

Quad Cities Nuclear Power Station (QCNPS) Plant Parameters Tables

(Includes Changes Made Since October 10, 2002, Submittal)

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Table 3:	Quad Cities Parameters and Methods Applicable to Suppression Pool pH Transient Analysis	Page 9
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Table 5:	Quad Cities Parameters and Methods Applicable to the Main Steam Line Break (MSLB) Accident	Page 13
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Table 1: Quad Cities General Parameters and Methods Applicable to Design Basis Accidents

General AST Analysis Parameter or Method	Currently Licensed Value or Method	Value or Method Submitted in October 10, 2002, AST Application	Final Supplemented Value or Method Used in AST Analysis	Justification for Change
Core Power Level	3016 MWth (current) 100% power is 2957 MWth, 102% power with RG 1.49 instrument uncertainty allowance is 3016 MWth.	3016 MWth (current) 100% power is 2957 MWth, 102% power with RG 1.49 instrument uncertainty allowance is 3016 MWth.	3016 MWth (current) 100% power is 2957 MWth, 102% power with RG 1.49 instrument uncertainty allowance is 3016 MWth.	No changes
Core Source Terms	TID-14844	ORIGEN2-based inventory. Includes the 60 isotopes in the standard RADTRAD library.	ORIGEN2-based inventory. Includes the 60 isotopes in the standard RADTRAD library.	No changes since 10/10/02 submittal. TID-14844 continues to be used for Equipment Qualification purposes.
Dose Conversion Factors for Thyroid Inhalation, Whole Body, and TEDE Dose	Thyroid – TID-14844 Whole Body – TID-14844 TEDE – N/A	Federal Guidance Reports 11 & 12 (RADTRAD input file) (TEDE only)	Federal Guidance Reports 11 & 12 (RADTRAD input file) (TEDE only)	RG 1.183 No changes since 10/10/02 submittal.
Distance to EAB	380 meters	380 meters	380 meters	No changes
EAB Dispersion Factors – Elevated Release (LOCA) 0 – 0.5 hr 0.5 – 2 hr	N/A – New X/Qs needed for AST	(sec/m^3) 1.37E-04 3.21E-06	(sec/m^3) 1.57E-04 6.38E-06	(PAVAN) Changed from currently licensed for AST. New design analysis as supplemented on November 5, 2004, and this supplement after revision with historic terrain data included per NRC RAI dated 7/22/05.
EAB Dispersion Factors – Ground Level Release (LOCA) 0 – 2 hr	N/A – New X/Qs needed for AST	(sec/m^3) 1.25E-03	(sec/m^3) 1.36E-03	(PAVAN) Changed from currently licensed for AST. New design analysis as supplemented on November 5, 2004, and this supplement. MSLB, CRDA, & FHA are listed in the Tables associated with these accidents.

Table 1: Quad Cities General Parameters and Methods Applicable to Design Basis Accidents

General AST Analysis Parameter or Method	Currently Licensed Value or Method	Value or Method Submitted in October 10, 2002, AST Application	Final Supplemented Value or Method Used in AST Analysis	Justification for Change
Distance to LPZ	4828 meters	4828 meters	4828 meters	No changes
LPZ Dispersion Factors – Elevated Release (LOCA) 0 – 0.5 hr 0.5 – 2 hr 2 – 8 hr 8 – 24 hr 1 – 4 day 4 – 30 day	N/A – New X/Qs needed for AST	(sec/m^3) 1.38E-05 3.09E-06 1.52E-06 1.07E-06 4.95E-07 1.64E-07	(sec/m^3) 1.44E-05 2.72E-06 1.32E-06 9.25E-07 4.24E-07 1.38E-07	(PAVAN) Changed from currently licensed for AST. New design analysis as supplemented on November 5, 2004, and this supplement.
LPZ Dispersion Factors – Ground Level Release (LOCA) 0 – 2 hr 2 – 8 hr 8 – 24 hr 1 – 4 day 4 – 30 day	N/A – New X/Qs needed for AST	(sec/m^3) 6.68E-04 3.07E-05 2.08E-05 8.95E-06 2.67E-06	(sec/m^3) 1.04E-04 4.14E-05 2.62E-05 9.96E-06 2.52E-06	(PAVAN, RG 1.194) Changed from currently licensed for AST. New design analysis as supplemented on November 5, 2004, and this supplement with downwash included per NRC RAI dated 7/22/05.
CR Dispersion Factors – Elevated Release (LOCA) 0– 2 hr 2 – 8 hr 8 – 24 hr 1 – 4 day 4 – 30 day	N/A – New X/Qs needed for AST	(sec/m^3) 2.35E-09 1.15E-09 8.02E-10 3.96E-10 1.21E-10	(sec/m^3) 5.84E-06 2.68E-06 1.81E-06 7.77E-07 2.30E-07	(PAVAN, RG 1.194) Changed from currently licensed for AST. New design analysis as supplemented on November 5, 2004, and this supplement with downwash included per NRC RAI dated 7/22/05.
CR Dispersion Factors – Ground Level Release via MSIVs (LOCA) 0 – 2 hr 2 – 8 hr 8 – 24 hr 1 – 4 day 4 – 30 day	N/A – New X/Qs needed for AST	(sec/m^3) 1.13E-03 9.45E-04 4.54E-04 2.68E-04 1.67E-04	(sec/m^3) 1.02E-03 8.23E-04 3.55E-04 2.23E-04 1.38E-04	(ARCON96, RG 1.194) Changed from currently licensed for AST. New design analysis as supplemented on November 5, 2004, and this supplement.

Table 1: Quad Cities General Parameters and Methods Applicable to Design Basis Accidents

General AST Analysis Parameter or Method	Currently Licensed Value or Method	Value or Method Submitted in October 10, 2002, AST Application	Final Supplemented Value or Method Used in AST Analysis	Justification for Change
CR Dispersion Factors – Ground Level Release MSIV (CRDA) 0 – 10 min 10 min – 2 hr 2 – 8 hr 8 – 24 hr	N/A – New X/Qs needed for AST	(sec/m^3) 4.16E-04 1.13E-03 9.45E-04 4.54E-04	(sec/m^3) 1.02E-03 1.02E-03 8.23E-04 3.55E-04	(ARCON96, RG 1.194) Changed from currently licensed for AST. New design analysis as supplemented on November 5, 2004, and this supplement.
Control Room Volume	184,000 ft^3 (Emergency Zone)	184,000 ft^3 (Emergency Zone)	184,000 ft^3 (Emergency Zone)	No changes
CREV System Initiation (Manual)	40 minutes after LOCA initiation	40 minutes after LOCA initiation	40 minutes after LOCA initiation	No changes During this 40-minute period for manual operator action, the normal mode of the CR HVAC system operation is assumed. A Technical Evaluation was performed that demonstrated up to 60,000 cfm of unfiltered air intake/inleakage into the CR during this period will result in acceptable CR operator doses over the 30-day accident period. Section 5.1.2 of the revised LOCA calculation erroneously states "the single active component failures modeled in this calculation are the MSIV in one main steam line failing to close and the operation of the CREV system failing to start by Safety Injection signal." Although the CREV does not automatically initiate, the system will alarm on a high radiation signal, thereby allowing operators to manually initiate the system within 40 minutes. EGC has initiated actions

Table 1: Quad Cities General Parameters and Methods Applicable to Design Basis Accidents				
General AST Analysis Parameter or Method	**Currently Licensed Value or Method**	**Value or Method Submitted in October 10, 2002, AST Application**	**Final Supplemented Value or Method Used in AST Analysis**	**Justification for Change**
				to remove the reference to the "Safety Injection signal." The correction to the calculation does not alter the results of the analyses.
Filtered Intake Rate - CREF Mode	2,000 cfm +/- 10%	2,000 cfm +/- 10%	2,000 cfm +/- 10%	No changes
CR Intake Filter Efficiency	99% for all Iodines	97% for all Iodines	99% for all Iodines	Changed back to currently licensed value. The decision to change back to the currently licensed value for intake filter efficiency is based on results of the 7/14/05 meeting between NRC and Exelon to reflect the guidance in RG 1.52.
CR Unfiltered Inleakage	260 cfm, including 10 cfm for ingress/egress	600 cfm, including 10 cfm for ingress/egress	400 cfm, including 10 cfm for ingress/egress	Supported by design basis analysis and previous tracer gas testing.

Table 2: Quad Cities Parameters and Methods Applicable to LOCA

LOCA AST Analysis Parameter or Method	Currently Licensed Value or Method	Value or Method Submitted in October 10, 2002, AST Application	Supplemented Value or Method Used in AST Analysis	Justification for Change
Releases to Containment	TID-14844 Instantaneous release into containment at T = 0	No Core Activity Release for first 2 minutes. Release Fractions and Timing per NUREG-1465	No Core Activity Release for first 2 minutes. Release Fractions and Timing per NUREG-1465	RG 1.183 No changes since 10/10/02 submittal.
Natural Deposition in Containment	TID-14844	Power's algorithm built into RADTRAD 10 percentile value	Powers' algorithm built into RADTRAD 10 percentile value	No changes since 10/10/02 submittal.
Containment Spray Removal Mechanism	Not credited	Not credited	Not credited	No changes
Containment Volume	1.58E+05 ft^3	1.58E+05 ft^3	1.58E+05 ft^3 (0 – 2 hours) 2.69E+05 ft^3 (2 – 720 hours)	Supported by design basis analysis.
Drywell Surface Area	32,250 ft^3	32,250 ft^3	32,250 ft^3	No changes The conservative Dresden value used in analysis for conservatism.
Minimum Suppression Pool water volume	110,000 ft^3	110,000 ft^3	110,000 ft^3	No Changes
Primary Containment Total Leak Rate, Including MSIV Leakage	1.0% per day	3.0% per day for first 24 hours (L_a); 1.5% per day thereafter	3.0% per day (L_a);	Supported by design basis analysis. No reduction taken after 24 hours per this supplement
Aerosol Natural Deposition Coefficients Used in the Containment	TID-14844	Credit is taken for natural deposition of aerosols based on equations for the Power's model in NUREG/CR 6189 and input directly into RADTRAD as natural deposition time dependent lambdas. No credit is assumed for natural deposition of elemental or organic iodine, or for suppression pool scrubbing.	Credit is taken for natural deposition of aerosols based on equations for the Power's model in NUREG/CR 6189 and input directly into RADTRAD as natural deposition time dependent lambdas. No credit is assumed for natural deposition of elemental or organic iodine, or for suppression pool scrubbing.	No changes since 10/10/02 submittal. Containment aerosol deposition per RADTRAD Power Model using 10% uncertainty. Elemental iodine deposition per SRP 6.5.2.

Table 2: Quad Cities Parameters and Methods Applicable to LOCA

LOCA AST Analysis Parameter or Method	Currently Licensed Value or Method	Value or Method Submitted in October 10, 2002, AST Application	Supplemented Value or Method Used in AST Analysis	Justification for Change
Main Steam Line and Condenser Holdup Credit for MSIV Leakage	N/A	No credit is taken for holdup and plate-out downstream of the outboard MSIVs or in the condenser since these components have not been evaluated for seismic ruggedness.	No credit is taken for holdup and plate-out downstream of the outboard MSIVs or in the condenser since these components have not been evaluated for seismic ruggedness.	No changes
MSIV leak rate	79.6 scfh @ 48 psig total in all 4 lines	250 scfh (100 scfh assumed for the two shortest lines) 125 scfh after 24 hours Leading edge of MSIV leakage conservatively assumed to exit main steam line at T = 40 minutes.	150 scfh (60 scfh maximum for any one line)	Supported by design basis analysis. No reduction taken after 24 hours per this supplement Supercedes response to NRC Request 6 in September 15, 2003, supplement.
Deposition/Plateout	N/A	Modified AEB 98-03 method	AEB 98-03 well-mixed flow is now assumed. (See attached Table 7 for AEB 98-03 Parameters and details).	Supported by design basis analysis.
Secondary Containment Volume	4.7E+06 ft^3	4.7E+06 ft^3	4.7E+06 ft^3	No changes
Fraction of Secondary Containment Available for Mixing	0.5	0.5	0.5	No changes
Secondary Containment Drawdown Time	N/A	N/A	N/A	No changes
Standby Gas Treatment (SGT) System flow rate	4000 cfm + 10% = 4400 cfm	4000 cfm + 10% = 4400 cfm	4000 cfm + 10% = 4400 cfm	No changes
SGT System Filter Efficiency Aerosol/Particulate: Elemental Iodine: Organic Iodine:	 99% 95% 95%	 99% 50% 50%	 99% 50% 50%	Reverted back to the currently licensed TS values.

Table 2: Quad Cities Parameters and Methods Applicable to LOCA				
LOCA AST Analysis Parameter or Method	**Currently Licensed Value or Method**	**Value or Method Submitted in October 10, 2002, AST Application**	**Supplemented Value or Method Used in AST Analysis**	**Justification for Change**
			Although TS limit is 95%, 50% efficiency is used for elemental and organic iodine in analysis for conservatism.	
ECCS Leakage into Secondary Containment Leak Rate	10 gph	2 gpm (2 times the maximum allowable admin limit of 1 gpm)	2 gpm (2 times the maximum allowable admin limit of 1 gpm)	Supported by design analysis.
ECCS Fraction Flashed	10%	10%	10%	No changes
ECCS Filtered by SGT System	Yes	Yes	Yes	No changes
ECCS Leakage Duration	0 – 30 days	0 – 30 days	0 – 30 days	No changes
Control Room Operator Shine Dose (LOCA)	Shine dose includes TID-14844 isotopes	Shine dose includes TID-14844 isotopes (Same dose assumed for conservatism)	Shine dose includes RG 1.183 isotopes	Supported by design basis analysis. Shine doses using the 60-isotope library (i.e., RG 1.183 isotopes) from the RADTRAD computer code were calculated in response to an NRC RAI dated August 19, 2004.

Table 3: Quad Cities Parameters and Methods Applicable to Suppression Pool pH Transient Analysis

Suppression Pool pH Transient AST Analysis Parameter or Method	Currently Licensed Value or Method	Value or Method Submitted in October 10, 2002, AST Application	Supplemented Value or Method Used in AST Analysis	Justification for Change
Maximum Suppression Pool Water Volume	115,655 ft^3 at 65°F	115,655 ft^3 at 65°F	115,655 ft^3 at 65°F	No changes
Maximum Reactor Coolant Mass	590,000 lb	590,000 lb	590,000 lb	No changes
Maximum Volume of Water Pumped Into Containment Post-LOCA	10,000 ft3 at 65°F	10,000 ft^3 at 65°F	10,000 ft^3 at 65°F	No changes
Minimum Mass of Sodium Pentaborate Delivered Within 100 minutes Post-LOCA	4041 lb	4041 lb	4041 lb	No changes
Maximum Volume of Sodium Pentaborate Solution Delivered	3253.4 gal	3253.4 gal	3253.4 gal	No changes
Maximum Cable Mass in Conduit including jacket, insulation, and fillers (70% of total)	17,250 lb	17,250 lb	17,250 lb	No changes
Maximum Cable Mass not in Conduit including jacket, insulation, and fillers (30% of total)	5750 lb	5750 lb	5750 lb	No changes
Integrated worst-case 30-day post-LOCA beta dose in the containment atmosphere	1700 Mrads	1700 Mrads	1700 Mrads	No changes
Integrated worst-case 30-day post-LOCA gamma dose in the containment atmosphere	98.1 Mrads	98.1 Mrads	98.1 Mrads	No changes
Total integrated worst-case 30-day post-LOCA dose (gamma + beta) in the suppression pool	52.4 Mrads	52.4 Mrads	52.4 Mrads	No changes
Minimum ECCS flow rate from suppression pool	4500 gpm per pump	4500 gpm per pump	4500 gpm per pump	No changes

Table 3: Quad Cities Parameters and Methods Applicable to Suppression Pool pH Transient Analysis				
Suppression Pool pH Transient AST Analysis Parameter or Method	**Currently Licensed Value or Method**	**Value or Method Submitted in October 10, 2002, AST Application**	**Supplemented Value or Method Used in AST Analysis**	**Justification for Change**
Standby Liquid Control (SLC) system credit	SLC system not credited for pH control	Credited for pH control. Full sodium pentaborate injection into suppression pool within several hours of accident initiation and pool is well mixed	Credited for pH control. Full sodium pentaborate injection into suppression pool within several hours of accident initiation and pool is well mixed	SLC system credited per 10/10/02 submittal. No change since 10/10/02 submittal.
Iodine Re-evolution from Containment Liquids (none if pH maintained above 7)	N/A – Not required for TID-14844	None. Suppression pool pH stays at 7 or above during entire accident.	None. Suppression pool pH stays at 7 or above during entire accident.	New design basis analysis performed for the 10/10/02 submittal. No change since 10/10/02 submittal.

Table 4: Quad Cities Parameters and Methods Applicable to CRDA

CRDA AST Analysis Parameter or Method	Currently Licensed Value or Method	Value or Method Submitted in October 10, 2002, AST Application	Supplemented Value or Method Used in AST Analysis	Justification for Change
Damaged Fuel Releases to Reactor Coolant	850 fuel rods failed - (45,612 fuel rods in core)	850 fuel rods failed - (45,612 fuel rods in core)	850 fuel rods failed - (45,612 fuel rods in core)	No changes
Fraction of failed fuel that melts	0.77% Value used in NEDO-31400A (Section 2.1, page 2)	0.77% Value used in NEDO-31400A (Section 2.1, page 2)	0.77% Value used in NEDO-31400A (Section 2.1, page 2)	No changes
Fuel Bundles in Core	724	724	724	No changes
Fuel peaking factor	1.7	1.7	1.7	No changes
Radioactivity transport pathway	Carryover with steam to condenser prior to MSIV closure and leakage from condenser to the environment	Carryover with steam to condenser prior to MSIV closure and leakage from condenser to the environment	Carryover with steam to condenser prior to MSIV closure and leakage from condenser to the environment	No changes
Fuel released activity carried to condenser before MSIV complete closure	Noble Gases 100% Iodines 10% Remaining radionuclides 1%	Noble Gases 100% Iodines 10% Remaining radionuclides 1%	Noble Gases 100% Iodines 10% Remaining radionuclides 1%	No changes
Charcoal Delay Bed Noble Gas Delay for SJAE Pathway	14.6 days for Xe 19.4 hrs for Kr	14.6 days for Xe 19.4 hrs for Kr	14.6 days for Xe 19.4 hrs for Kr	No changes
CREV System Initiation	Not credited	Not credited	Not credited	No changes
Activity in condenser release to environment	Noble Gases 100% Iodines 10% Remaining radionuclides 1%, with released Iodine species as follows: 97% elemental and 3% organic	Noble Gases 100% Iodines 10% Remaining radionuclides 1%, with released Iodine species as follows: 97% elemental and 3% organic	Noble Gases 100% Iodines 10% Remaining radionuclides 1%, with released Iodine species as follows: 97% elemental and 3% organic	No changes
Airborne condenser activity leakrate to environment	1% per day for 24 hours, then 0.	1% per day for 24 hours, then 0.	1% per day for 24 hours, then 0.	No changes

Table 4: Quad Cities Parameters and Methods Applicable to CRDA

CRDA AST Analysis Parameter or Method	Currently Licensed Value or Method	Value or Method Submitted in October 10, 2002, AST Application	Supplemented Value or Method Used in AST Analysis	Justification for Change
Credit for activity decay during condenser residence	Yes	Yes	Yes	No changes
Credit for activity decay after release to environment	No	No	No	No changes
Credit for accident termination features	Yes, isolation of Mechanical Vacuum Pumps by main steam line rad monitors upon CRDA initiation.	Yes, isolation of Mechanical Vacuum Pumps by main steam line rad monitors upon CRDA initiation.	Yes, isolation of Mechanical Vacuum Pumps by main steam line rad monitors upon CRDA initiation.	No changes
Credit for Holdup in Turbine Building	No	No	No	No changes
Condenser Volume (vapor space)	55,000 cu. ft.	55,000 cu. ft.	55,000 cu. ft.	No changes
Atmospheric Dispersion	N/A – New X/Qs needed for AST	See Table 1	See Table 1	X/Q values changed per design analysis in supplement dated November 5, 2004, and updated in this supplement.

Table 5: Quad Cities Parameters and Methods Applicable to the Main Steam Line Break (MSLB) Accident				
MSLB AST Analysis Parameter or Method	**Currently Licensed Value or Method**	**Value or Method Submitted in October 10, 2002, AST Application**	**Supplemented Value or Method Used in AST Analysis**	**Justification for Change**
MSIV closure time	5.5 seconds	5.5 seconds	5.5 seconds	No changes
Break Characteristic and Mass Release Discharged Volume	96,250 lb (53,750 lb liquid and 42,500 lb steam)	96,250 lb (53,750 lb liquid and 42,500 lb steam)	140,000 lb liquid (no steam) (40% flashing)	This change ensures that the discharged mass is maximized (conservative application of SRP 15.6.4, Paragraph III.2.a). The value of 140,000 lb liquid is only used for control room and offsite dose analysis. The values for coolant released listed in the current license basis remain the basis for no fuel damage.
Release characteristics	All the radioactivity in the released coolant is assumed to be released to the atmosphere instantaneously as a ground level release. No credit is assumed for plateout, holdup, or dilution within facility buildings.	All the radioactivity in the released coolant is assumed to be released to the atmosphere instantaneously as a ground level release. No credit is assumed for plateout, holdup, or dilution within facility buildings.	All the radioactivity in the released coolant is assumed to be released to the atmosphere instantaneously as a ground level release. No credit is assumed for plateout, holdup, or dilution within facility buildings.	No changes
Amount of Fuel Damage Projected	None	None	None	No changes
Analyzed Cases and Activity Releases	Two cases analyzed, one without and one with postulated iodine spike, using TS reactor coolant activity limits and reactor coolant iodine activity concentrations. Maximum equilibrium value 0.2 uCi/gm Pre-accident spike activity	Two cases analyzed, one without and one with postulated iodine spike, using TS reactor coolant activity limits and reactor coolant iodine activity concentrations. Maximum equilibrium value 0.2 uCi/gm Pre-accident spike activity	Two cases analyzed, one without and one with postulated iodine spike, using TS reactor coolant activity limits and reactor coolant iodine activity concentrations. Maximum equilibrium value 0.2 uCi/gm Pre-accident spike activity 4.0	The activity of the cloud is based on the total mass of water released from the break.

Table 5: Quad Cities Parameters and Methods Applicable to the Main Steam Line Break (MSLB) Accident				
MSLB AST Analysis Parameter or Method	**Currently Licensed Value or Method**	**Value or Method Submitted in October 10, 2002, AST Application**	**Supplemented Value or Method Used in AST Analysis**	**Justification for Change**
	4.0 uCi/gm	4.0 uCi/gm	uCi/gm Noble gas and cesium activities are now considered in addition to iodine.	NRC RAI question received July 22, 2005, required the addition of noble gas and cesium activity to be considered in the dose consequence analysis.
Iodine Species Released	RG 1.5	95% CsI as aerosol 4.85% elemental 0.15% organic	95% CsI as aerosol 4.85% elemental 0.15% organic	RG 1.183 No changes since 10/10/02 submittal.
Atmospheric Dispersion EAB: LPZ:	N/A Updated for AST Updated for AST	 (sec/m^3) 8.64E-04 8.69E-05	 (sec/m^3) 8.64E-04 8.69E-05	No changes since 10/10/02 submittal. Used method described in RG 1.5.

Table 6: Quad Cities Parameters and Methods Applicable to the Fuel Handling Accident (FHA)				
FHA AST Analysis Parameter or Method	**Currently Licensed Value or Method**	**Value or Method Submitted in October 10, 2002, AST Application**	**Supplemented Value or Method Used in AST Analysis**	**Justification for Change**
Minimum time after shutdown required before movement of recently irradiated fuel	24 hours	24 hours	24 hours	No changes
Fuel bundle peak burnup	N/A	Not to exceed 62 GWD/MTU.	Not to exceed 62 GWD/MTU.	No changes since 10/10/02 submittal.
Maximum linear heat generation rate.	N/A	6.3 kw/ft average power for fuel exceeding 54 GWD/MTU	6.3 kw/ft average power for fuel exceeding 54 GWD/MTU	RG 1.183 No changes since 10/10/02 submittal.
Spent fuel source terms are based on reactor core source terms for LOCA	TID-14844	ORIGEN2-based inventory. Includes the 60 isotopes in the standard RADTRAD library (same as for LOCA).	ORIGEN2-based inventory. Includes the 60 isotopes in the standard RADTRAD library (same as for LOCA).	Supported by design basis analysis. No changes since 10/10/02 submittal.
Radial Peaking Factor	1.5	1.7	1.7	Supported by design basis analysis. No changes since 10/10/02 submittal.
Analyzed water depths above damaged fuel	19 feet	19 feet This value corresponds to the minimum expected coverage over spent fuel racks, and the Technical Specification 3.7.8 limit. It provides assurance that analyzed coverage accounts for potential dropped fuel that might be positioned lying over the spent fuel racks.	19 feet This value corresponds to the minimum expected coverage over spent fuel racks, and the Technical Specification 3.7.8 limit. It provides assurance that analyzed coverage accounts for potential dropped fuel that might be positioned lying over the spent fuel racks.	Supported by design analysis. No changes since 10/10/02 submittal.
Accident Release Duration	2 hours	2 hours Activity reaching the refuel floor airspace will essentially be all (99.97%) exhausted within two hours by using an	2 hours Activity reaching the refuel floor airspace will essentially be all (99.97%) exhausted within two hours by using an artificially	No changes since 10/10/02 submittal.

Table 6: Quad Cities Parameters and Methods Applicable to the Fuel Handling Accident (FHA)				
FHA AST Analysis Parameter or Method	**Currently Licensed Value or Method**	**Value or Method Submitted in October 10, 2002, AST Application**	**Supplemented Value or Method Used in AST Analysis**	**Justification for Change**
		artificially high exhaust rate. This also provides an allowance for uneven mixing in the refuel floor airspace.	high exhaust rate. This also provides an allowance for uneven mixing in the refuel floor airspace.	
Exhaust pathway	Filtration through SGT system as elevated release	Through the normal exhaust to the Reactor Building Exhaust Stack. No credit is taken for filtration by the SGT system, or resulting elevated release through the station chimney.	Through the normal exhaust to the Reactor Building Exhaust Stack. No credit is taken for filtration by the SGT system, or resulting elevated release through the station chimney.	Supported by design basis analysis. No changes since 10/10/02 submittal.
Credit for operation of CREV	Credited	No credit is taken for the operation of the CREV during the FHA. Normal intake and outflow are credited.	No credit is taken for the operation of the CREV during the FHA. Normal intake and outflow are credited.	Supported by design basis analysis. No changes since 10/10/02 submittal.
Fuel Assembly Configuration	7x7 in a 49-pin bundle	7x7 in a 49-pin bundle	7x7 in a 49-pin bundle	No changes
Number of Pins Damaged	111 total pins damaged (bounding).	111 total pins damaged (bounding).	111 total pins damaged (bounding).	No changes
FHA Radionuclide Inventory	Based on Appendix D of GENE-A22-00103-64-01, Task Report T0802, Rev. 0, "Radiation Sources and Fission Products"	Based on Appendix D of GENE-A22-00103-64-01, Task Report T0802, Rev. 0, "Radiation Sources and Fission Products", for the 60 isotopes forming the standard RADTRAD library, with decay to 24 hours. Gap activities are per R.G. 1.183.	Based on Appendix D of GENE-A22-00103-64-01, Task Report T0802, Rev. 0, "Radiation Sources and Fission Products", for the 60 isotopes forming the standard RADTRAD library, with decay to 24 hours. Gap activities are per R.G. 1.183.	No changes since 10/10/02 submittal.
Underwater Decontamination Factor	Iodine DF = 100	Iodine DF = 135, corresponding to a 19-ft water depth	Iodine DF = 135, corresponding to a 19-ft water depth	Supported by design basis analysis.

Table 6: Quad Cities Parameters and Methods Applicable to the Fuel Handling Accident (FHA)				
FHA AST Analysis Parameter or Method	**Currently Licensed Value or Method**	**Value or Method Submitted in October 10, 2002, AST Application**	**Supplemented Value or Method Used in AST Analysis**	**Justification for Change**
	Noble Gas DF = 1 Particulate DF = infinity	Noble Gas DF = 1 Particulates (cesiums and rubidiums) DF = infinity	Noble Gas DF = 1 Particulates (cesiums and rubidiums) DF = infinity	RG 1.183. No changes since 10/10/02 submittal.
Iodine chemical distribution	97% Elemental 3% organic	95% CsI, instantaneously dissociating in the pool water and re-evolving as elemental iodine, unless the pH of the pool water is justified mechanistically to be above 7; 4.8 5% elemental; 0.15% organic	95% CsI, instantaneously dissociating in the pool water and re-evolving as elemental iodine, unless the pH of the pool water is justified mechanistically to be above 7; 4.8 5% elemental; 0.15% organic	Supported by design basis analysis. RG 1.183. No changes since 10/10/02 submittal.
Secondary Containment automatic isolation and filtration	Credited	Not credited for all fuel with 24 hours decay.	Not credited for all fuel with 24 hours decay.	Supported by design basis analysis. RG 1.183, TSTF-51 No changes since 10/10/02 submittal.
Mitigation by CREV system	Credited	Not credited for all fuel with 24 hours decay	Not credited for all fuel with 24 hours decay	No changes since 10/10/02 submittal.
Normal and Emergency Control Room fresh air makeup rate	Design Basis Intake 2000 cfm + 10% uncertainty + 600 cfm inleakage	Design Basis Intake 2000 cfm + 10% uncertainty + 600 cfm unfiltered inleakage. 4000 cfm used for conservatism and to allow for possible additional inleakage due to CR envelope maintenance during refueling outages.	58,300 cfm used for conservatism.	Supported by design basis analysis. No changes since 10/10/02 submittal.
Refuel Floor Normal	Secured upon initiation of	Approximately 4 air changes	Approximately 4 air changes	Supported by design basis

Table 6: Quad Cities Parameters and Methods Applicable to the Fuel Handling Accident (FHA)

FHA AST Analysis Parameter or Method	Currently Licensed Value or Method	Value or Method Submitted in October 10, 2002, AST Application	Supplemented Value or Method Used in AST Analysis	Justification for Change
Ventilation rate and volume	SGT system	per hour and 4,500,000 ft^3 (Total Reactor Building Volume)	per hour and 4,500,000 ft^3 (Total Reactor Building Volume)	analysis. No changes since 10/10/02 submittal.
CR Worst Case Release Point Basis Dispersion Factors 0 – 2 hr	SGT system (elevated, filtered)	Normal RB exhaust stack (ground level, unfiltered) 5.82E-04 sec/m^3	Normal RB exhaust stack (ground level, unfiltered) 5.82E-04 sec/m^3	Supported by design basis analysis. No changes since 10/10/02 submittal.
EAB Worst Case Release Point Basis Dispersion Factors 0 – 2 hr	SGT system (elevated, filtered)	Normal RB exhaust stack (ground level, unfiltered) 7.87E-04 sec/m^3	Normal RB exhaust stack (ground level, unfiltered) 1.36-03 sec/m^3	Supported by design basis analysis.
LPZ Worst Case Release Point Basis Dispersion Factors 0 – 2 hr	SGT system (elevated, filtered)	Normal RB exhaust stack (ground level unfiltered) 4.69E-05 sec/m^3	Normal RB exhaust stack (ground level unfiltered) 1.04E-04 sec/m^3	Supported by design basis analysis.

Table 7: Quad Cities AEB 98-03 Parameters and Methods Used for MSIV Leakage Analysis

AEB 98-03 Parameters and Methods	Supplemented Value or Method Used in AST Analysis	Justification
MSIV Leakage Distribution	40% in MS Line A (Shortest line) 40% in MS Line D (2nd shortest line) 20% in MS Line C (3rd shortest line) 0% in MS Line B (4th shortest line)	Leakage limits are 150 scfh total, and 60 scfh for any one line. Maximizing flow through shorter lines minimizes piping deposition credit.
Nodalization for AEB 98-03 well mixed modeling; Single Active Failure Assumptions	Two-node treatment is used for each steam line in which flow occurs. The first node is from the reactor vessel to the inboard MSIV. The second node is from the inboard MSIV to the outboard MSIV.	Inboard MSIV failure is selected. The aerosol and elemental iodine depositions are not credited in the "faulted" steam line between the RPV nozzle and inboard MSIV.
Inboard Piping Volumes and Surface Areas	For Aerosol Settling LINE / Vol (ft^3) / Area(ft^2) MS A / 40.0 / 34.54 MS D / 39.97 / 34.52 MS C / 49.01 / 42.33 For Elemental Iodine Deposition, a DF of 2 or elemental removal efficiency of 50% is used per AEB 98-03, Appendix B	Aerosol deposition includes horizontal projected piping surface area. Only horizontal piping volumes are used in the aerosol deposition analysis. The mechanism for elemental iodine removal is due to chemical adsorption and is independent of surface orientation. Therefore, consideration of vertical piping is appropriate.
Outboard Piping Volumes and Surface Areas	For Aerosol Settling LINE / Vol (ft^3) / Area(ft^2) MS A / 47.28 / 40.83 MS D / 49.11 / 42.41 MS C / 49.11 / 42.41 For Elemental Iodine Deposition, a DF of 2 or elemental removal efficiency of 50% is used per AEB 98-03, Appendix B	Aerosol deposition includes horizontal projected piping surface area. Only horizontal piping volumes are used in the aerosol deposition analysis. The mechanism for elemental iodine removal is due to chemical adsorption and is independent of surface orientation. Therefore, consideration of vertical piping is appropriate.

Table 7: Quad Cities AEB 98-03 Parameters and Methods Used for MSIV Leakage Analysis

AEB 98-03 Parameters and Methods	Supplemented Value or Method Used in AST Analysis	Justification
Associated Containment Leak Rate	Leak Rates LINE (scfh) (cfh) (cfm) MS A 60 60 1.0 MS D 60 60 1.0 MS C 30 30 0.5	Total MSIV leakage measured @ 48 psig = 150 scfh
Drywell MSIV leakage to Inboard Piping Node (0-2 hrs)	Leak Rates LINE (cfh) (cfm) MS A 21.41 0.357 MS D 21.41 0.357 MS C 10.70 0.175	Values are as determined based on the total MSIV leak rate.
Drywell MSIV leakage to Inboard Piping Node (2-720 hrs) (Drywell + suppression pool air space)	Leak Rates LINE (cfh) (cfm) MS A 12.58 0.210 MS D 12.58 0.210 MS C 6.28 0.105	Values are as determined based on the total MSIV leak rate.
Outboard Piping Node Flow Rate (0-720 hrs) (Drywell + suppression pool air space)	Leak Rates LINE (cfh) (cfm) MS A 60 1.0 MS D 60 1.0 MS C 30 0.5	Values are conservatively expanded based on outside pressure with containment at P_a and Fluid Temperature at 291 °F for the accident duration, compared with standard conditions at 68 °F.
Leak Rate and flow rates after 24 hours	Leak rates and flow rates are conservatively not reduced after 24 hours.	
Seismic Design of Credited Piping	Credited piping is seismically designed and includes in-containment piping from the reactor vessel to the outboard MSIV.	

Table 8: Quad Cities Technical Specification Changes Since 10/10/02 Submittal (Affected Pages)			
Tech Spec Changes (Affected Pages)	**Tech Spec Changes Submitted in October 10, 2002, AST Application**	**Final Supplemented Tech Spec Changes**	**Justification for Change**
1.1-2		No change since 10/10/02 submittal.	
1.1-3	Reference to FGR-11 & 12 in definition of dose equivalent iodine	Clarified statement to remove the reference to FGR-12. Clarified use of inhalation committed dose conversion factors.	Supplement dated September 15, 2003 Supplement dated September 22, 2004
3.1.7-1		No change since 10/10/02 submittal.	
3.3.6.1-7		No change since 10/10/02 submittal.	
3.3.6.2-4		No change since 10/10/02 submittal.	
3.3.7.1-4		No change since 10/10/02 submittal.	
3.6.1.3-8	Verify the leakage rate through each MSIV leakage path is </= 57 scfh when tested at >/= 25 psig, and the combined leakage rate for all MSIV leakage paths is </= 144 scfh when tested at >/= 25 psig.	Verify the leakage rate through each MSIV leakage path is </= 34 scfh when tested at >/= 25 psig, and the combined leakage rate for all MSIV leakage paths is </= 86 scfh when tested at >/= 25 psig.	Supported by design basis analysis per this supplement.
3.6.4.1-1		No change since 10/10/02 submittal.	
3.6.4.1-2		No change since 10/10/02 submittal.	
3.6.4.2-1		No change since 10/10/02 submittal.	
3.6.4.2-3		No change since 10/10/02 submittal.	
3.6.4.3-1		No change since 10/10/02	

Table 8: Quad Cities Technical Specification Changes Since 10/10/02 Submittal (Affected Pages)			
Tech Spec Changes (Affected Pages)	**Tech Spec Changes Submitted in October 10, 2002, AST Application**	**Final Supplemented Tech Spec Changes**	**Justification for Change**
		submittal.	
3.6.4.3-2		No change since 10/10/02 submittal.	
3.6.4.3-3	SR 3.6.4.3.1 removal of SGT system heaters from SR.	Withdrawn – will continue to perform SR with heaters operating. No changes to Condition F since 10/10/02 submittal.	Supplement dated September 15, 2003
3.7.4-1		No change since 10/10/02 submittal.	
3.7.4-2		No change since 10/10/02 submittal.	
3.7.5-1		No change since 10/10/02 submittal.	
3.7.5-2		No change since 10/10/02 submittal.	
3.8.1-15		No change since 10/10/02 submittal.	
3.8.2-1		No change since 10/10/02 submittal.	
3.8.2-3		No change since 10/10/02 submittal.	
3.8.2-4		No change since 10/10/02 submittal.	
3.8.5-1		No change since 10/10/02 submittal.	
3.8.8-1		No change since 10/10/02 submittal.	
3.8.8-2		No change since 10/10/02 submittal.	

Table 8: Quad Cities Technical Specification Changes Since 10/10/02 Submittal (Affected Pages)			
Tech Spec Changes (Affected Pages)	**Tech Spec Changes Submitted in October 10, 2002, AST Application**	**Final Supplemented Tech Spec Changes**	**Justification for Change**
5.5-7	Change SGT system testing relative humidity (RH) from 70% to 95% Change penetration test acceptance criteria for SGT system to 50% Change penetration test acceptance criteria for CREV System to 5%	Withdrawn – will continue to perform laboratory test at 70% RH. Withdrawn – penetration criteria remains at 2.5%. Withdrawn – penetration criteria remains at 0.5%.	Supplement dated September 15, 2003
5.5-8	Delete requirement for periodic SGT system heater testing	Withdrawn – will continue to test SGT system with heaters on.	Supplement dated September 15, 2003
5.5-12		No change since 10/10/02 submittal.	

Table 9: Summary of Quad Cities LOCA Dose Re-Analysis			
EAB (rem TEDE)	LPZ (rem TEDE)	Control Room (DBA Case) (rem TEDE)	Dose Contributor
6.17E-02	1.17E-01	1.58E-02	Containment Leakage (max EAB dose occurs @ 4.3 hours)
2.66E-02	9.30E-02	3.05E-02	ESF Leakage (max EAB dose occurs @ 16 hours)
8.38E+00	1.44E+00	3.35E+00	MSIV Leakage (max EAB dose occurs at 2.9 hours)
N/A	N/A	2.20E-01	Containment Shine to CR
N/A	N/A	2.09E-01	External Cloud Shine to CR
N/A	N/A	Negligible	CR Filter Shine to CR
8.47	1.65	3.83	Total Calculated Value
25	25	5	Dose Limit

Table 10: Summary of Quad Cities MSLB Dose Re-Analysis			
EAB (rem TEDE)	LPZ (rem TEDE)	Control Room (DBA Case) (rem TEDE)	Analyzed Case
6.38E-02	6.42E-03	9.20E-02	Case 1: Normal Equilibrium of 0.2 µCi
1.27E+00	1.27E-01	1.84E+00	Case 2: Iodine Spike of 4.0 µCi
Case 1: 2.5 Case 2: 25	Case 1: 2.5 Case 2: 25	Case 1: 5 Case 2: 5	Dose Limits

Table 11: Summary of Quad Cities CRDA Dose Re-Analysis			
EAB (rem TEDE)	LPZ (rem TEDE)	Control Room (DBA Case) (rem TEDE)	Analyzed Case
7.14E-01	1.48E-01	2.33E+00	Main Condenser Leakage
1.43E+00	1.09E-01	7.92E-01	Gland Seal Condenser Leakage
1.58E+00	1.21E-01	4.13E-02	SJAE Releases
2.14E+00	2.57E-01	3.12E+00	Total Main and Gland Seal Condenser Leakage
3.01E+00	2.30E-01	8.33E-01	Total Gland Seal Condenser Leakage and SJAE Release
6.3	6.3	5	Dose Limits

Table 12: Summary of Quad Cities FHA Dose Re-Analysis			
EAB (rem TEDE)	LPZ (rem TEDE)	Control Room (DBA Case) (rem TEDE)	Analyzed Case
5.24E+00	4.01E-01	1.80E+00	With 19 feet Water Coverage
6.3	6.3	5	Dose Limits

ATTACHMENT 20

Technical Evaluation to Evaluate the Impact of Accounting for Terrain Effects in Determining the Post-LOCA Dispersion Coefficients at the Dresden Nuclear Power Station (DNPS)

Technical Evaluation

Passport EC # 356383, Revision 0

Technical Evaluation to Evaluate the Impact of Accounting for Terrain Effects in Determining the Post-LOCA Dispersion Coefficients at the Dresden Nuclear Power Station (DNPS)

REASON FOR EVALUATION / SCOPE:

In the July 22, 2005 letter from M. Banerjee (U.S. NRC) to C. M. Crane (Exelon Generation Company LLC) the NRC staff requested additional information regarding whether or not the elevated release χ/Q values calculated for Dresden post-LOCA dispersion in Exelon Design Analysis DRE04-0030, Rev. 0 "adequately reflect reduced effective plume heights due to terrain." Revision 1 of this calculation specifically includes terrain effects on Exclusion Area Boundary χ/Q values, but not for the Low Population Zone (LPZ) χ/Q values, as LPZ doses are not limiting with respect to the dose acceptance criterion. The purpose of this evaluation is to justify this by evaluating LPZ dispersion coefficients with a bounding terrain height assumption, and then demonstrating that the resulting LPZ dose does not exceed dose limits, or change the limiting offsite dose location from the EAB at DNPS. Control Room dose is unaffected by changes in dispersion due to terrain effects.

DETAILED EVALUATION:

To conservatively address concerns with the impact of terrain effects on the LPZ dose at DNPS, the bounding case of having offsite terrain, at the LPZ distance, artificially assumed to be at the height of the stack is analyzed. PAVAN was run using this assumption, and new χ/Q's were calculated; these run inputs are included in Attachment 1 to this Technical Evaluation. After calculating these bounding offsite χ/Q's (seen in the Attachment 2 summary), the ratio was taken between these artificial, and extremely conservative, values and the current Rev. 1 analysis LPZ dispersion coefficients that do not account for terrain effects. These ratios are then applied to the LOCA LPZ dose with respect to time. Attachment 3 shows these ratios and the new dose associated with them.

Exelon Design Analysis DRE05-0048, Rev. 0 details the calculation of the current offsite doses to which the ratios calculated in Attachment 3 are applied. It is assumed for this Technical Evaluation that these values are adequately checked, verified, and correct.

This Technical Evaluation is intended to supplement a new revision to the analysis DRE04-0030, "Atmospheric Dispersion Factors (χ/Q's) for Accident Release", which currently calculates the χ/Q's of concern. This new revision will more accurately and rigorously account for terrain effects at DNPS than the artificial, but bounding, approach used herein. Subsequent to the revision to DRE04-0030, it is expected that DRE05-0048, "Dresden Units

2 & 3 Post-LOCA EAB, LPZ, and CR Dose – AST Analysis", will also be revised to incorporate the effects of the new LPZ atmospheric dispersion factors.

CONCLUSIONS / FINDINGS:

It is shown in Attachment 3 that the offsite LPZ dose with the ratio applied is still comfortably within the dose limits detailed in the USNRC Regulatory Guide 1.183 and Standard Review Plan 15.0.1. Additionally, Attachment 3 demonstrates that even after the ratios are applied, the post-LOCA EAB dose at DNPS remains the bounding offsite dose.

REFERENCES:

1. U.S. NRC Regulatory Guide 1.183, Alternative Radiological Source Terms for Evaluating Design Basis Accidents at Nuclear Power Reactors, July 2000.

2. NUREG-0800, Standard Review Plan Section 15.0.1, Rev. 0, July 2000.

3. Exelon Design Analysis DRE04-0030, Revision 1, "Atmospheric Dispersion Factors ($^{\chi}/_{Q}$'s) for Accident Release".

4. Exelon Design Analysis DRE05-0048, Revision 0, "Dresden Units 2 & 3 Post-LOCA EAB, LPZ, and CR Dose – AST Analysis".

Preparer: Aleem Boatright — Date: 8/22/05
Aleem Boatright (Washington Group Intl., Inc.)

Independent Reviewer: Harold Rothstein — Date: 8/22/05
Harold Rothstein (Washington Group Intl., Inc.)

Exelon Owner Acceptance: T. Mscisz — Date: 8/22/05
Thomas Mscisz

Approved: T. Mscisz for E. Flick per telecon — Date: 8/22/05
Elliott Flick

Note: Independent third party review performed by W.J. Johnson (S&L) for concurrence of results (8/22/05).

Attachment 1

```
   1  1111
Dresden                                   Elevated Release
91.4 meters          10.7-91.4 meters

Dresden, Elevated Release, LPZ, Station Chimney, Revision 1 met data
    7    1
1545. 43.1 94.6 91.4
    0    0    0    0    0    0    0
   1.   0.   0.   1.   0.   2.   1.   0.   2.   0.   0.   2.   1.   0.   2.   1.
  15.  24.  44.  54.  40.  65.  45.  22.  17.  25.  25.  24.  13.   9.  10.  10.
  57.  85.  63.  61.  34.  47.  86.  32.  23.  38.  25.  39.  23.  28.  37.  39.
  36.  69.  46.   9.  28.  19.  13.   9.   6.  37.  33.  34.  12.  57.  60.  64.
   4.  13.   9.   0.   8.   5.   0.   2.   2.  12.  17.   4.   6.  29.  27.  12.
   3.   1.   2.   0.   3.   3.   1.   0.   4.   9.   8.   9.   8.  21.   5.   3.
   1.   1.   1.   2.   5.   2.   1.   3.   4.   1.   6.   3.   1.   1.   3.   1.
  22.  21.  27.  54.  36.  52.  61.  19.  20.  30.  24.  51.  29.  14.  26.  18.
  45.  34.  42.  44.  34.  31.  53.  43.  40.  38.  35.  69.  31.  64.  56.  51.
  35.  31.  38.   6.  15.  13.  14.  18.  36.  48.  37.  65.  43.  88.  84.  43.
   5.   7.  10.   1.   3.   6.   1.   8.  17.  36.  27.  14.  17.  35.  21.  21.
   4.   2.   2.   0.   3.   1.   0.   1.  10.  21.  11.   7.  17.  26.   6.   1.
   3.   5.   5.   6.   1.   5.   5.   2.   6.   5.   4.   2.   2.   6.   1.   2.
  38.  32.  35.  38.  41.  49.  67.  34.  31.  32.  37.  64.  40.  43.  33.  38.
  44.  36.  34.  41.  33.  45.  38.  61.  53.  50.  57.  79.  74.  97.  74.  58.
  40.  30.  35.  11.  15.  10.  20.  28.  51.  54.  50.  61.  62.  85.  76.  49.
   8.   2.   6.   1.   5.   8.   6.  10.  21.  42.  32.  20.  33.  38.  32.  25.
   2.   1.   1.   0.   0.   6.   6.   1.  19.  21.  16.  13.  22.  31.   9.   8.
  24.  18.  26.  37.  26.  25.  28.  15.  20.  28.  26.  19.  30.  34.  27.  35.
 117. 122. 179. 297. 134. 106. 107. 114. 124. 125. 134. 130. 152. 141. 162. 151.
 264. 209. 345. 612. 373. 215. 186. 254. 244. 212. 215. 230. 433. 410. 341. 286.
 302. 314. 335. 265. 343. 219. 160. 283. 342. 237. 275. 246. 628. 653. 451. 378.
 138. 169. 128.  24. 161. 146. 108. 150. 280. 212. 133. 119. 427. 373. 205. 171.
  38. 101.  69.   2.  48.  41.  54. 104. 161. 158. 120. 115. 276. 202.  68.  82.
  10.  14.  12.  27.  24.  17.  17.  17.  13.  13.  15.  21.  14.   8.   9.   3.
  54.  57. 113. 234. 120.  78.  91. 110.  83.  76.  93.  92.  94.  77.  79.  58.
 150. 195. 254. 306. 294. 214. 291. 291. 225. 215. 177. 224. 237. 192. 234. 155.
 242. 230. 207.  75. 278. 311. 292. 394. 457. 510. 390. 219. 352. 368. 315. 307.
  72.  60.  22.   4.  44.  93.  68. 141. 401. 324. 189.  79. 128. 124.  71.  77.
   7.   4.   5.   2.   6.  24.  28.  70. 199. 142.  64.  22.  29.  16.  15.  12.
  12.   4.  14.  15.   7.  10.  11.  17.  15.  17.  16.  14.  13.   9.   9.  12.
  26.  29.  42.  58.  48.  43.  50.  60.  56.  57.  35.  55.  71.  46.  41.  29.
  96.  75.  56.  36.  53.  70. 134. 133.  84.  64. 110. 176. 180.  81.  89.  60.
 130. 118.  34.   2.  33. 101. 166. 116.  96. 148. 270. 211. 100.  86. 107. 116.
  37.  15.   7.   0.   2.  29.  20.  14.  43.  72.  79.  31.  10.  37.   8.  22.
   1.   0.   0.   0.   0.   0.   0.   1.   4.   5.   2.   2.   2.   0.   0.   1.
   2.   8.   9.   8.   1.   4.   3.   4.   7.   4.   2.   3.   1.   7.   4.   5.
   3.   7.  20.  21.   4.   4.   9.   8.  19.  12.  20.  14.  12.  19.   9.  14.
  36.  28.  14.   3.   4.  12.  18.  21.  24.  18.  24.  29.  51.  25.  17.  16.
  36.  37.   6.   0.   1.   4.  25.  33.  10.  24.  29.  57.  40.  13.  30.  26.
  11.   1.   0.   0.   0.   8.   5.   6.   2.  12.  19.   6.   2.   4.   1.  10.
   0.   0.   0.   0.   0.   0.   0.   0.   0.   2.   0.   0.   0.   0.   0.   0.
 101. 0.93 3.50 7.50 12.5 18.5 24.0 55.0
8000.8000.8000.8000.8000.8000.8000.8000.8000.8000.8000.8000.8000.8000.8000.8000.
  -1.8000.8000.8000.8000.8000.8000.8000.8000.8000.8000.8000.8000.8000.8000.8000.
   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.
   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.
8000.8000.8000.8000.8000.8000.8000.8000.8000.8000.8000.8000.8000.8000.8000.8000.
0095.0095.0095.0095.0095.0095.0095.0095.0095.0095.0095.0095.0095.0095.0095.0095.
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Attachment 2 – PAVAN Run Summary

USNRC COMPUTER CODE-PAVAN, VERSION 2.0 RUN DATE: 08/18/05

PLANT NAME: Dresden
DATA PERIOD:
TYPE OF RELEASE: Elevated Release
SOURCE OF DATA:
COMMENTS: Dresden, Elevated Release, LPZ, Station Chimney, Revision 1 met data
PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145

METEOROLOGICAL INSTRUMENTATION
WIND SENSORS HEIGHT: 91.4 meters
DELTA-T HEIGHTS: 10.7-91.4 meters

RELATIVE CONCENTRATION (X/Q) VALUES (SEC/CUBIC METER)
VERSUS
AVERAGING TIME

DOWNWIND SECTOR	DISTANCE (METERS)	0-2 HOURS	0-8 HOURS	8-24 HOURS	1-4 DAYS	4-30 DAYS	ANNUAL AVERAGE	HOURS PER YEAR MAX 0-2 HR X/Q IS EXCEEDED IN SECTOR	DOWNWIND SECTOR
S	8000.	5.87E-06	2.49E-06	1.62E-06	6.37E-07	1.67E-07	3.24E-08	26.9	S
SSW	8000.	5.63E-06	2.40E-06	1.56E-06	6.18E-07	1.63E-07	3.20E-08	454.5	SSW
SW	8000.	5.34E-06	2.34E-06	1.55E-06	6.35E-07	1.76E-07	3.67E-08	26.7	SW
WSW	8000.	6.34E-06	2.79E-06	1.86E-06	7.63E-07	2.13E-07	4.47E-08	31.5	WSW
W	8000.	4.70E-06	2.08E-06	1.39E-06	5.74E-07	1.62E-07	3.43E-08	18.1	W
WNW	8000.	5.01E-06	2.18E-06	1.43E-06	5.81E-07	1.59E-07	3.24E-08	19.1	WNW
NW	8000.	6.32E-06	2.71E-06	1.78E-06	7.10E-07	1.90E-07	3.80E-08	27.8	NW
NNW	8000.	6.82E-06	2.95E-06	1.94E-06	7.80E-07	2.11E-07	4.27E-08	33.5	NNW
N	8000.	6.13E-06	2.72E-06	1.81E-06	7.48E-07	2.10E-07	4.46E-08	30.1	N
NNE	8000.	6.32E-06	2.77E-06	1.84E-06	7.50E-07	2.08E-07	4.32E-08	30.6	NNE
NE	8000.	7.41E-06	3.17E-06	2.07E-06	8.25E-07	2.20E-07	4.35E-08	37.7	NE
ENE	8000.	7.76E-06	3.29E-06	2.14E-06	8.42E-07	2.21E-07	4.30E-08	40.6	ENE
E	8000.	8.11E-06	3.51E-06	2.30E-06	9.27E-07	2.51E-07	5.07E-08	43.7	E
ESE	8000.	5.76E-06	2.57E-06	1.72E-06	7.15E-07	2.03E-07	4.36E-08	27.4	ESE
SE	8000.	5.68E-06	2.49E-06	1.64E-06	6.70E-07	1.85E-07	3.83E-08	25.7	SE
SSE	8000.	5.40E-06	2.34E-06	1.54E-06	6.21E-07	1.69E-07	3.43E-08	24.6	SSE
MAX X/Q		8.11E-06				TOTAL HOURS AROUND SITE:		898.4	
SRP 2.3.4	8000.	8.30E-06	3.57E-06	2.34E-06	9.39E-07	2.53E-07	5.07E-08		
SITE LIMIT		8.30E-06	3.57E-06	2.34E-06	9.39E-07	2.53E-07	5.07E-08		

THE FIVE-PERCENT-FOR-THE-ENTIRE-SITE X/Q IS LIMITING.

X/Q VALUES (SEC/CUBIC METER) FOR FUMIGATION AT THE BOUNDARY:

DOWNWIND SECTOR	DISTANCE (METERS)	FUMIGATION X/Q
S	8000.	1.55E-05
SSW	8000.	1.55E-05
SW	8000.	1.55E-05
WSW	8000.	1.55E-05
W	8000.	1.55E-05
WNW	8000.	1.55E-05
NW	8000.	1.55E-05
NNW	8000.	1.55E-05
N	8000.	1.55E-05
NNE	8000.	1.55E-05
NE	8000.	1.55E-05
ENE	8000.	1.55E-05
E	8000.	1.55E-05
ESE	8000.	1.55E-05
SE	8000.	1.55E-05
SSE	8000.	1.55E-05

	A	B	C	D	E	F	G	H	I
1	**Attachment 3 - Dresden LOCA Worst-Case LPZ Terrain Effects Analysis**								
2									
3									
4		**0 - 0.5 hrs**	**0.5 - 2 hrs**	**2 - 8 hrs**	**8 - 24 hrs**	**1 - 4 days**	**4 - 30 days**		
5	**Old LPZ X/Q (sec/m^3)**	8.84E-06	1.78E-06	8.50E-07	5.87E-07	2.63E-07	8.31E-08		
6	**New Test LPZ X/Q (sec/m^3)**	1.55E-05	8.30E-06	3.57E-06	2.34E-06	9.39E-07	2.53E-07		
7	**Ratio**	1.7534	4.6629	4.2000	3.9864	3.5703	3.0445		
8									
9									**Totals**
10	**PC Leakage Δ Dose (rem TEDE)**	1.42E-04	2.67E-03	2.34E-02	2.39E-02	1.72E-02	7.92E-03		7.53E-02
11	**MSIV Leakage Δ Dose (rem TEDE)**	6.89E-04	6.30E-02	1.73E-01	7.99E-02	3.71E-02	1.42E-02		3.68E-01
12	**ESF Leakage Δ Dose (rem TEDE)**	2.36E-05	3.55E-04	5.19E-03	9.79E-03	2.25E-02	2.00E-02		5.79E-02
13	**Total Δ Dose (rem TEDE)**	8.54E-04	6.60E-02	2.02E-01	1.14E-01	7.69E-02	4.21E-02		**5.01E-01**
14									
15	**New X/Q Adjusted Total Δ Dose (rem TEDE)**	9.79E-04	7.71E-02	2.93E-01	2.14E-01	1.79E-01	9.92E-02		**8.64E-01**
16								**LPZ Limit (rem TEDE)**	**2.50E+01**
17									
18								**Ratio of Old LPZ Dose to New LPZ Dose**	**1.72**
19									
20									
21								**EAB Dose (rem TEDE)**	**1.58E+00**
22									
23								**Ratio of EAB (2-hr) to LPZ Dose**	**0.55**

	A	B	C	D	E	F	G	H	I
1	Attachment 3 - Dresden LOCA Worst-Case LPZ Terrain Effects Analysis								
2									
3									
4		0 - 0.5 hrs	0.5 - 2 hrs	2 - 8 hrs	8 - 24 hrs	1 - 4 days	4 - 30 days		
5	X/Q (sec/m^3)	0.00000884	0.00000178	0.00000085	0.000000587	0.000000263	0.0000000831		
6	X/Q (sec/m^3)	0.0000155	0.0000083	0.00000357	0.00000234	0.000000939	0.000000253		
7	Ratio	=B6/B5	=C6/C5	=D6/D5	=E6/E5	=F6/F5	=G6/G5		
8									
9									Totals
10	(rem TEDE)	0.00014183	=0.0028152-B10	=0.026243-B10-C10	=0.050142-D10-C10-B10	=0.06739-E10-D10-C10-B10	=0.075313-F10-E10-D10-C10-B10		=B10+C10+D10+E10+F10+G10
11	(rem TEDE)	0.00068878	=0.063691-B11	=0.23683-B11-C11	=0.31676-D11-C11-B11	=0.35388-E11-D11-C11-B11	=0.36807-F11-E11-D11-C11-B11		=B11+C11+D11+E11+F11+G11
12	(rem TEDE)	0.000023625	=0.00037881-B12	=0.0055651-B12-C12	=0.015359-D12-C12-B12	=0.03787-E12-D12-C12-B12	=0.057879-F12-E12-D12-C12-B12		=B12+C12+D12+E12+F12+G12
13	(rem TEDE)	=SUM(B10:B12)	=SUM(C10:C12)	=SUM(D10:D12)	=SUM(E10:E12)	=SUM(F10:F12)	=SUM(G10:G12)		=B13+C13+D13+E13+F13+G13
14									
15	(rem TEDE)	=((B10+B12)*B7)+B11	=((C10+C12)*C7)+C11	=((D10+D12)*D7)+D11	=((E10+E12)*E7)+E11	=((F10+F12)*F7)+F11	=((G10+G12)*G7)+G11		=B15+C15+D15+E15+F15+G15
16								m TEDE)	25
17									
18								PZ Dose	=I15/I13
19									
20									
21								m TEDE)	1.58
22									
23								PZ Dose	=I15/I21

ATTACHMENT 21

Technical Evaluation to Evaluate the Impact of Accounting for Terrain Effects in Determining the Post-LOCA Dispersion Coefficients at the Quad Cities Nuclear Power Station (QCNPS)

Technical Evaluation

Passport EC # 356379, Revision 0

Technical Evaluation to Evaluate the Impact of Accounting for Terrain Effects in Determining the Post-LOCA Dispersion Coefficients at the Quad Cities Nuclear Power Station (QCNPS)

REASON FOR EVALUATION / SCOPE:

In the July 22, 2005 letter from M. Banerjee (U.S. NRC) to C. M. Crane (Exelon Generation Company LLC) the NRC staff requested additional information regarding whether or not the elevated release χ/Q values calculated for Quad Cities post-LOCA dispersion in Exelon Design Analysis QDC-0000-M-1408, Rev. 0 "adequately reflect reduced effective plume heights due to terrain." Revision 1 of this calculation specifically includes terrain effects on Exclusion Area Boundary χ/Q values, but not for the Low Population Zone (LPZ) χ/Q values, as LPZ doses are not limiting with respect to the dose acceptance criterion. The purpose of this evaluation is to justify this by evaluating LPZ dispersion coefficients with a bounding terrain height assumption, and then demonstrating that the resulting LPZ dose does not exceed dose limits, or change the limiting offsite dose location from the EAB at QCNPS. Control Room dose is unaffected by changes in dispersion due to terrain effects.

DETAILED EVALUATION:

To conservatively address concerns with the impact of terrain effects on the LPZ dose at QCNPS, the bounding case of having offsite terrain, at the LPZ distance, artificially assumed to be at the height of the stack is analyzed. PAVAN was run using this assumption, and new χ/Q's were calculated; these run inputs are included in Attachment 1 to this Technical evaluation. After calculating these bounding offsite χ/Q's (seen in the Attachment 2 summary), the ratio was taken between these artificial, and extremely conservative, values and the current Rev. 1 analysis LPZ dispersion coefficients that do not account for terrain effects. These ratios are then applied to the LOCA LPZ dose with respect to time. Attachment 3 shows these ratios and the new dose associated with them.

Exelon Design Analysis QDC-0000-N-1481, Rev. 0 details the calculation of the current offsite doses to which the ratios calculated in Attachment 3 are applied. It is assumed for this Technical Evaluation that these values are adequately checked, verified, and correct.

This Technical Evaluation is intended to supplement a new revision to the analysis QDC-0000-M-1408, "Atmospheric Dispersion Factors (χ/Q's) for Accident Release", which currently calculates the χ/Q's of concern. This new revision will more accurately and rigorously account for terrain effects at QCNPS than the artificial, but bounding, approach used herein. Subsequent to the revision to QDC-0000-M-1408, it is expected that QDC-

0000-N-1481, "Quad Cities Units 1 & 2 Post-LOCA EAB, LPZ, and CR Dose – AST Analysis", will also be revised to incorporate the effects of the new LPZ atmospheric dispersion factors.

CONCLUSIONS / FINDINGS:

It is shown in Attachment 3 that the offsite LPZ dose with the ratio applied is still comfortably within the dose limits detailed in the USNRC Regulatory Guide 1.183 and Standard Review Plan 15.0.1. Additionally, Attachment 3 demonstrates that even after the ratios are applied, the post-LOCA EAB dose at QCNPS remains the bounding offsite dose.

REFERENCES:

1. U.S. NRC Regulatory Guide 1.183, Alternative Radiological Source Terms for Evaluating Design Basis Accidents at Nuclear Power Reactors, July 2000.

2. NUREG-0800, Standard Review Plan Section 15.0.1, Rev. 0, July 2000.

3. Exelon Design Analysis QDC-0000-M-1408, Revision 1, "Atmospheric Dispersion Factors (χ/Q's) for Accident Release".

4. Exelon Design Analysis QDC-0000-N-1481, Revision 0, " Quad Cities Units 1 & 2 Post-LOCA EAB, LPZ, and CR Dose – AST Analysis".

Preparer: Aleem Boatright — Date: 8/22/05
Aleem Boatright (Washington Group Intl., Inc.)

Independent Reviewer: Harold Rothstein — Date: 8/22/05
Harold Rothstein (Washington Group Intl., Inc.)

Exelon Owner Acceptance: Thomas Mscisz — Date: 8/22/05
Thomas Mscisz

Approved: Thomas for E. Flick per telecon — Date: 8/22/05
Elliott Flick

Note: Independent third party review performed by W.S. Johnson (S&L) for concurrence of results. (8/22/05)

Attachment 1 – PAVAN Run Input

```
   1  1111
Quad Cities                                   Elevated Release
90.2 meters          10.1-90.2 meters

QDC, Elevated Release, LPZ, Station Chimney, Revision 1 met data
    7    1
1564. 43.7 94.6 90.2
    0    0    0    0    0    0    0
   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.
   4.   5.   4.   8.   2.   1.   3.   6.   5.   9.  10.  20.  18.  29.  23.  12.
  33.  45.  30.  25.  12.   9.  28.  57.  28.  90.  49.  47.  78.  59.  72.  73.
  20.  23.  28.  11.   5.  11.  28.  62.  69. 120.  24.  32.  47.  87. 102.  60.
   1.   3.   4.   5.   0.   5.   9.  21.  29.  35.   5.   3.  11.  44.  37.   9.
   1.   0.   2.   2.   0.   1.   0.   4.   3.  16.   0.   0.   2.   6.   8.   0.
   0.   0.   0.   0.   1.   0.   1.   1.   0.   0.   0.   2.   1.   1.   2.   0.
  22.  21.  22.  29.  17.  20.  16.  23.  18.  42.  46.  37.  48.  42.  31.  31.
  46.  53.  54.  29.  24.  41.  44.  69.  45.  99.  57.  64.  70.  65.  72.  53.
  15.  15.  25.  11.  12.  18.  29.  39.  26.  64.  39.  34.  72.  65.  58.  57.
   6.   4.   2.  11.   5.  12.   6.   9.  11.  27.  14.   3.  26.  32.  25.   5.
   0.   1.   1.   3.   0.   2.   1.   3.   3.   6.   4.   1.   7.  11.   8.   2.
   0.   0.   0.   0.   0.   2.   1.   1.   0.   4.   3.   4.   4.   3.   1.   1.
  42.  28.  34.  33.  38.  28.  30.  42.  30.  64.  65.  40.  56.  63.  65.  53.
  43.  54.  50.  31.  37.  39.  53.  69.  41.  93.  49.  60.  76.  69.  59.  61.
  23.  15.  33.  26.  20.  34.  33.  37.  32.  50.  43.  49.  78.  73.  76.  40.
   9.   6.   5.  13.   9.  12.   7.  12.  12.  28.  12.  12.  38.  47.  29.   9.
   1.   1.   0.   4.   2.   5.   0.   0.   5.  16.   3.   1.  17.  22.   8.   3.
  36.  19.  25.  30.  29.  31.  29.  34.  26.  29.  38.  28.  41.  29.  36.  24.
 157. 128. 156. 170. 268. 186. 167. 153. 135. 180. 173. 174. 196. 172. 227. 175.
 295. 260. 334. 351. 391. 296. 229. 264. 182. 208. 246. 275. 340. 519. 505. 308.
 337. 258. 353. 384. 330. 225. 251. 204. 236. 274. 244. 291. 578. 914. 678. 329.
  73. 107. 215. 234.  99. 152. 103.  98. 116. 164. 131. 112. 338. 485. 325. 109.
  25.  26.  71.  78.  16.  62.  43.  59.  71.  64.  51.  48. 233. 307. 113.  19.
  20.  14.   5.  17.  23.  22.  12.   5.  18.  12.  15.  16.   6.   5.  13.  16.
  77.  75.  88.  88. 149.  76.  78.  78.  69.  76.  81.  59.  67.  70.  74.  90.
 187. 159. 169. 182. 255. 211. 198. 219. 205. 264. 201. 168. 208. 204. 236. 247.
 209. 131. 158. 194. 162. 282. 301. 329. 408. 468. 438. 287. 348. 397. 308. 243.
  13.   8.  27.  46.  20.  89.  95. 145. 237. 310. 173.  49.  69.  51.  25.  10.
   1.   0.   4.   6.   4.  24.  14.  61.  85.  99.  24.   5.   4.   3.   0.   1.
  14.  19.  13.  17.  12.   6.   7.   9.  11.   9.   8.  14.  13.  15.   8.   8.
  46.  48.  52.  62.  72.  57.  46.  50.  46.  22.  48.  33.  45.  20.  41.  52.
 104.  75.  99.  80.  95. 113. 122. 205. 166. 179. 104.  72.  61.  60.  80. 108.
  54.  38.  47.  44.  40. 154. 234. 243. 255. 259.  92.  45.  63.  78.  57.  50.
   1.   0.   3.   2.   0.  26.  38.  29.  28.  31.  15.   2.   3.   7.   2.   2.
   0.   0.   0.   0.   0.   0.   0.   0.   0.   2.   0.   0.   0.   0.   0.   0.
  10.  11.   9.  14.  14.  10.   7.  11.   8.  11.   5.   1.   9.   7.   2.   8.
  23.  27.  26.  31.  24.  33.  45.  20.  39.  40.  44.  26.  28.  15.  12.  23.
  30.  23.  29.  28.  24.  48.  76.  99.  89.  88.  64.  23.  39.  27.  25.  16.
  15.  10.  10.   0.   5.  22.  74. 115.  91. 119.  30.   8.   9.  12.   9.  13.
   1.   0.   0.   0.   1.   6.  12.   6.   3.   6.   1.   1.   0.   1.   0.   0.
   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.
 101. 0.75 3.50 7.50 12.5 18.5 24.0 55.0
4828.4828.4828.4828.4828.4828.4828.4828.4828.4828.4828.4828.4828.4828.4828.4828.
  -1.4828.4828.4828.4828.4828.4828.4828.4828.4828.4828.4828.4828.4828.4828.4828.
   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.
   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.
4828.4828.4828.4828.4828.4828.4828.4828.4828.4828.4828.4828.4828.4828.4828.4828.
0095.0095.0095.0095.0095.0095.0095.0095.0095.0095.0095.0095.0095.0095.0095.0095.
```

Attachment 2 – PAVAN Run Summary

USNRC COMPUTER CODE-PAVAN, VERSION 2.0 RUN DATE: 08/18/05

PLANT NAME: Quad Cities
DATA PERIOD:
TYPE OF RELEASE: Elevated Releas
SOURCE OF DATA:
COMMENTS: QDC, Elevated Release, LPZ, Station Chimney, Revision 1 met data
PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145

METEOROLOGICAL INSTRUMENTATION
WIND SENSORS HEIGHT: 90.2 meters
DELTA-T HEIGHTS: 10.1-90.2 meters

RELATIVE CONCENTRATION (X/Q) VALUES (SEC/CUBIC METER)
VERSUS
AVERAGING TIME

DOWNWIND SECTOR	DISTANCE (METERS)	0-2 HOURS	0-8 HOURS	8-24 HOURS	1-4 DAYS	4-30 DAYS	ANNUAL AVERAGE	HOURS PER YEAR MAX 0-2 HR X/Q IS EXCEEDED IN SECTOR	DOWNWIND SECTOR
S	4828.	1.27E-05	5.50E-06	3.62E-06	1.46E-06	3.94E-07	7.96E-08	23.6	S
SSW	4828.	1.18E-05	5.04E-06	3.30E-06	1.31E-06	3.50E-07	6.94E-08	444.6	SSW
SW	4828.	1.22E-05	5.27E-06	3.47E-06	1.40E-06	3.80E-07	7.73E-08	22.8	SW
WSW	4828.	1.31E-05	5.73E-06	3.79E-06	1.54E-06	4.22E-07	8.69E-08	26.7	WSW
W	4828.	1.38E-05	6.07E-06	4.02E-06	1.65E-06	4.57E-07	9.53E-08	26.2	W
WNW	4828.	1.53E-05	6.57E-06	4.31E-06	1.72E-06	4.63E-07	9.27E-08	28.4	WNW
NW	4828.	1.86E-05	7.81E-06	5.06E-06	1.98E-06	5.13E-07	9.85E-08	37.9	NW
NNW	4828.	2.03E-05	8.55E-06	5.55E-06	2.18E-06	5.67E-07	1.09E-07	43.7	NNW
N	4828.	1.98E-05	8.37E-06	5.44E-06	2.14E-06	5.59E-07	1.08E-07	42.0	N
NNE	4828.	1.98E-05	8.53E-06	5.59E-06	2.24E-06	6.01E-07	1.20E-07	42.1	NNE
NE	4828.	1.62E-05	6.91E-06	4.52E-06	1.80E-06	4.78E-07	9.47E-08	32.2	NE
ENE	4828.	1.03E-05	4.51E-06	2.99E-06	1.22E-06	3.40E-07	7.08E-08	19.0	ENE
E	4828.	1.19E-05	5.34E-06	3.58E-06	1.50E-06	4.30E-07	9.34E-08	23.1	E
ESE	4828.	1.04E-05	4.80E-06	3.27E-06	1.42E-06	4.26E-07	9.80E-08	18.2	ESE
SE	4828.	1.05E-05	4.80E-06	3.24E-06	1.38E-06	4.07E-07	9.12E-08	14.9	SE
SSE	4828.	1.17E-05	5.14E-06	3.41E-06	1.39E-06	3.86E-07	8.02E-08	20.3	SSE
MAX X/Q		2.03E-05				TOTAL HOURS AROUND SITE:		865.8	
SRP 2.3.4	4828.	2.05E-05	8.76E-06	5.73E-06	2.28E-06	6.07E-07	1.20E-07		
SITE LIMIT		2.05E-05	8.76E-06	5.73E-06	2.28E-06	6.07E-07	1.20E-07		

THE FIVE-PERCENT-FOR-THE-ENTIRE-SITE X/Q IS LIMITING.

X/Q VALUES (SEC/CUBIC METER) FOR FUMIGATION AT THE BOUNDARY:

DOWNWIND SECTOR	DISTANCE (METERS)	FUMIGATION X/Q
S	4828.	3.01E-05
SSW	4828.	3.01E-05
SW	4828.	3.01E-05
WSW	4828.	3.01E-05
W	4828.	3.01E-05
WNW	4828.	3.01E-05
NW	4828.	3.01E-05
NNW	4828.	3.01E-05
N	4828.	3.01E-05
NNE	4828.	3.01E-05
NE	4828.	3.01E-05
ENE	4828.	3.01E-05
E	4828.	3.01E-05
ESE	4828.	3.01E-05
SE	4828.	3.01E-05
SSE	4828.	3.01E-05

	A	B	C	D	E	F	G	H	I
1	**Attachment 3 - Quad Cities LOCA Worst-Case LPZ Terrain Effects Analysis**								
2									
3									
4		**0 - 0.5 hrs**	**0.5 - 2 hrs**	**2 - 8 hrs**	**8 - 24 hrs**	**1 - 4 days**	**4 - 30 days**		
5	**Old LPZ X/Q (sec/m^3)**	1.44E-05	2.72E-06	1.32E-06	9.25E-07	4.24E-07	1.38E-07		
6	**New Test LPZ X/Q (sec/m^3)**	3.01E-05	2.05E-05	8.76E-06	5.73E-06	2.28E-06	6.07E-07		
7	**Ratio**	2.0903	7.5368	6.6364	6.1946	5.3774	4.3986		
8									
9									**Totals**
10	**PC Leakage Δ Dose (rem TEDE)**	2.21E-04	3.92E-03	3.50E-02	3.68E-02	2.76E-02	1.31E-02		1.17E-01
11	**MSIV Leakage Δ Dose (rem TEDE)**	2.72E-03	2.49E-01	6.84E-01	3.07E-01	1.41E-01	5.40E-02		1.44E+00
12	**ESF Leakage Δ Dose (rem TEDE)**	3.69E-05	5.21E-04	7.79E-03	1.52E-02	3.62E-02	3.32E-02		9.30E-02
13	**Total Δ Dose (rem TEDE)**	2.98E-03	2.54E-01	7.27E-01	3.59E-01	2.05E-01	1.00E-01		**1.65E+00**
14									
15	**New X/Q Adjusted Total Δ Dose (rem TEDE)**	3.26E-03	2.83E-01	9.68E-01	6.29E-01	4.85E-01	2.58E-01		**2.63E+00**
16								**LPZ Limit (rem TEDE)**	**2.50E+01**
17									
18								***Ratio of Old LPZ Dose to New LPZ Dose***	**1.59**
19									
20									
21								**EAB Dose (rem TEDE)**	**8.47E+00**
22									
23								**Ratio of EAB (2-hr) to LPZ Dose**	**0.31**

	A	B	C	D	E	F	G	H	I
1	Attachment 3 - Quad Cities LOCA Worst-Case LPZ Terrain Effects Analysis								
2									
3									
4		0 - 0.5 hrs	0.5 - 2 hrs	2 - 8 hrs	8 - 24 hrs	1 - 4 days	4 - 30 days		
5	Z X/Q (sec/m³)	0.0000144	0.00000272	0.00000132	0.000000925	0.000000424	0.000000138		
6	Z X/Q (sec/m³)	0.0000301	0.0000205	0.00000876	0.00000573	0.00000228	0.000000607		
7	Ratio	=B6/B5	=C6/C5	=D6/D5	=E6/E5	=F6/F5	=G6/G5		
8									
9									Totals
10	se (rem TEDE)	0.00022134	=0.0041411-B10	=0.039174-B10-C10	=0.076013-D10-C10-B10	=0.10363-E10-D10-C10-B10	=0.11672-F10-E10-D10-C10-B10		=B10+C10+D10+E10+F10+G10
11	se (rem TEDE)	0.0027237	=0.25186-B11	=0.93582-B11-C11	=1.2429-D11-C11-B11	=1.3843-E11-D11-C11-B11	=1.4383-F11-E11-D11-C11-B11		=B11+C11+D11+E11+F11+G11
12	se (rem TEDE)	0.000036869	=0.00055773-B12	=0.0083488-B12-C12	=0.023527-D12-C12-B12	=0.05976-E12-D12-C12-B12	=0.092987-F12-E12-D12-C12-B12		=B12+C12+D12+E12+F12+G12
13	se (rem TEDE)	=SUM(B10:B12)	=SUM(C10:C12)	=SUM(D10:D12)	=SUM(E10:E12)	=SUM(F10.F12)	=SUM(G10:G12)		=B13+C13+D13+E13+F13+G13
14									
15	se (rem TEDE)	=((B10+B12)*B7)+B11	=((C10+C12)*C7)+C11	=((D10+D12)*D7)+D11	=((E10+E12)*E7)+E11	=((F10+F12)*F7)+F11	=((G10+G12)*G7)+G11		=B15+C15+D15+E15+F15+G15
16								rem TEDE)	25
17									
18								y LPZ Dose	=I15/I13
19									
20									
21								rem TEDE)	8.47
22									
23								b LPZ Dose	=I15/I21

ATTACHMENT 22
Updated Responses to Previous NRC Requests for Additional Information

Submittal Date	NRC Request	Original RAI Response	Comments/Revised Response
9/15/03	Provide the calculation and associated assumptions which conclude that the MSIV leakage would not exit the main steam line prior to 40 minutes following the LOCA? (Pg 23)	Attachments 6 and 7 provide the LOCA calculations, with associated assumptions, for DNPS and QCNPS, respectively. In the calculation, it is estimated that environmental releases due to MSIV leakage will not occur until well over one hour. However, the analysis conservatively assumes that holdup of activity releases due to MSIV leakage in main steam lines (MSLs) is limited to 40 minutes (i.e., the time for CREV to be initiated)..	The revised LOCA calculations provided in Attachments 8 and 9 for DNPS and QCNPS, respectively, no longer assume that MSIV leakage would not exit the main steam line prior to 40 minutes following the LOCA.
9/15/03	It is stated that during the first 40 minutes following a LOCA the flow rate to the control room is 2000 cfm ± 10% through the CREV system. After 40 minutes the flow arrangement remains unchanged but now there is an additional 600 cfm of unfiltered inleakage into the CRE. These statements appear to be in conflict with other portions of the amendment request. Other statements in the amendment request indicate that it is only at Quad Cities that the CREV system is initiated automatically upon receipt of a High Radiation signal on the refueling floor area or in the reactor building ventilation exhaust. For Dresden, operator actions are required to place the CREV system into operation. Clarify the actual operating configuration for the CRE following a LOCA. (Pg. 24)	The CREV System at QCNPS automatically isolates the CREV System boundary upon receipt of a valid LOCA signal. Isolation of the CREV System boundary at DNPS requires manual action. At both DNPS and QCNPS, manual actions are required to place the CREV System into operation. The 600 cfm unfiltered inleakage from unidentified sources is assumed for both the first 40 minutes following a LOCA and after 40 minutes. The CREV System provides 2000 cfm +/- 10% to the control room envelope. The LOCA calculation was performed assuming that in the first 40 minutes, the control room envelope receives 2200 cfm of unfiltered air through the CREV System and 600 cfm of unfiltered air through other unidentified sources. After 40 minutes, the analysis assumes that the CREV System provides 1800 cfm of filtered air to the control room envelope, and an additional 600 cfm of unfiltered air is assumed to enter the control room envelope from other unidentified sources. Because CREV System filtration is only	The CREV System at QCNPS automatically isolates the CREV System boundary upon receipt of a valid LOCA signal. Isolation of the CREV System boundary at DNPS requires manual action. At both DNPS and QCNPS, manual actions are required to place the CREV System into operation. The revised LOCA calculations provided in Attachments 8 and 9 for DNPS and QCNPS, respectively assume 2000 cfm unfiltered inleakage from unidentified sources for the first 40 minutes following a LOCA. The CREV System provides 2000 cfm +/- 10% to the control room envelope. The LOCA calculation was performed assuming that in the first 40 minutes, the control room envelope receives 2200 cfm of unfiltered air through the CREV System and 2000 cfm of unfiltered air through other unidentified sources. After 40 minutes, the analysis assumes that the CREV System provides 1800 cfm of filtered air to the control room envelope, and an additional 400 cfm of unfiltered air is assumed to enter the control room envelope from other unidentified sources.

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		assumed to occur for the LOCA event (i.e., a 30 day event), any small change to the control room intake flow rate in the first 40 minutes does not significantly impact the results of the analysis. The control room heating, ventilation, and air conditioning (HVAC) system consists of two independent HVAC subsystems sharing some common ductwork. The subsystems include one multizone subsystem (i.e., "A" Train) and one single zone subsystem (i.e., "B" Train). "A" Train is the primary temperature control and air distribution subsystem for the control room emergency zone. "B" Train is a backup subsystem that serves the control room emergency zone when "A" Train is not available. The assumed 600 cfm of unfiltered inleakage is conservative for both DNPS and QCNPS. This is based on tracer gas testing and the CREV System design. At both DNPS and QCNPS, tracer gas testing of the control room boundary has been completed in both the "A" train filtration mode and "B" train filtration mode. The tracer gas testing results are summarized in the following table.	Because CREV System filtration is only assumed to occur for the LOCA event (i.e., a 30 day event), any small change to the control room intake flow rate in the first 40 minutes does not significantly impact the results of the analysis. Sensitivity studies (i.e., Attachments 8 and 9) have been performed to evaluate the impact of additional unfiltered inleakage into the DNPS and QCNPS control rooms prior to the operator action to manually align the CREV System to the emergency mode of operation. The conclusions demonstrate that control room doses remain within allowable dose limits when assuming an unfiltered inleakage of 60,000 cfm. The control room heating, ventilation, and air conditioning (HVAC) system consists of two independent HVAC subsystems sharing some common ductwork. The subsystems include one multizone subsystem (i.e., "A" Train) and one single zone subsystem (i.e., "B" Train). "A" Train is the primary temperature control and air distribution subsystem for the control room emergency zone. "B" Train is a backup subsystem that serves the control room emergency zone when "A" Train is not available. The assumed 400 cfm of unfiltered inleakage is conservative for both DNPS and QCNPS. This bounds the tracer gas testing. At both DNPS and QCNPS, tracer gas testing of the control room boundary has been completed in both the "A" train filtration mode and "B" train filtration mode. The tracer gas testing results are summarized in the following table.

<table>
<tr><th>Submittal Date</th><th>NRC Request</th><th>Original RAI Response</th><th>Comments/Revised Response</th></tr>
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<tr><th>Train</th><th>DNPS Inleakage</th><th>QCNPS Inleakage</th></tr>
<tr><td>"A" Train (filtration mode)</td><td>162 +/- 91 cfm</td><td>222 +/- 75 cfm</td></tr>
<tr><td>"B" Train (filtration mode)</td><td>156 +/- 86 cfm</td><td>88 +/- 75 cfm</td></tr>
</table>
Tracer gas testing was not performed in the normal mode of CREV System operation. However, the inleakage during the normal mode would be lower than during the filtration mode and is already included in the existing analysis as described below.

In the normal mode, the ductwork and outside air damper is directly adjacent to the air handling unit (i.e., within 36 inches). In the filtration mode, the damper is closed when the control room is isolated, and airflow is directed to the air handling unit fan by the return air vane axial fan and the suction of the air handling unit centrifugal fan. The negative pressure exerted on the damper and ductwork tying it to the air handling unit would be lower in the normal mode because the damper would be open allowing free flow of makeup air to the air handling unit. Also, the negative pressure of the associated ductwork tying it to the air handling unit would be lower since makeup would be freely accepted since airflow follows the path of least resistance (i.e., open damper versus closed damper).

As noted above, tracer gas testing was
</td>
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<table>
<tr><th>Train</th><th>DNPS Inleakage</th><th>QCNPS Inleakage</th></tr>
<tr><td>"A" Train (filtration mode)</td><td>162 +/- 91 cfm</td><td>222 +/- 75 cfm</td></tr>
<tr><td>"B" Train (filtration mode)</td><td>156 +/- 86 cfm</td><td>88 +/- 75 cfm</td></tr>
</table>
Tracer gas testing was not performed in the normal mode of CREV System operation. However, as described above, control room doses remain within allowable dose limits even when assuming 60,000 cfm of inleakage during the first 40 minutes following a LOCA.
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Submittal Date	NRC Request	Original RAI Response	Comments/Revised Response
		performed in the "A" Train filtration mode of CREV System operation, not the normal mode. The inlet and exhaust ducts are the only additional regions to be tested in the normal mode. In the normal mode, inleakage at the inlet would be no different than the unfiltered outside air and would enter the boundary as a part of the "A" Train normal flow. Any inleakage that occurs at the exhaust section of the duct would be swept to outside air. Therefore, the impact is minimal because the test results are unaffected by inleakage in these areas, although the "A" Train (i.e., normal mode) inlet and exhaust have not been tracer gas tested.	
9/15/03	There needs to be an inleakage number for the CRE during all accidents and a basis for that number. It is indicated that during the first 40 minutes following the LOCA the normal control room ventilation system is operating. During the operation of the normal system, unfiltered inleakage may also be occurring. It appears that no number has been provided. Provide the value for inleakage during the normal control room system's operation and the basis for that number. (Pg. 24)	As noted above, the CREV System provides 2000 cfm +/- 10% to the control room envelope. The CRDA calculation was performed assuming that, for the duration of the accident, the control room envelope receives 2200 cfm through the ventilation system (i.e., unfiltered) and 600 cfm through other unidentified sources (i.e., unfiltered). For the FHA, it is conservatively assumed that the control room envelope receives 4000 cfm of unfiltered air. For the MSLB, the dose is calculated for an individual outside of the control room, thereby assuming no control room protection.	See above Comments/Revised Response.
9/15/03	What is the removal mechanism for MSIV leakage in the vertical control volume? Provide the RADTRAD results for the MSIV leakage source term. (Pg. 24)	The natural deposition constants for the MSLs are given in design inputs 14 and 15 of the DNPS and QCNPS LOCA calculations (i.e., Attachments 6 and 7). The constants for aerosols account for gravitation settling and are applicable to horizontal pipe runs only. The constants for elemental iodine apply to	The aerosol removal efficiencies due to gravitational deposition on horizontal pipe surfaces are provided in Tables 4 and 3 of Attachments 8 and 9 for DNPS and QCNPS, respectively. The removal efficiencies account for gravitation settling and are applicable to horizontal pipe runs only. For

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		both horizontal and vertical pipe runs and include plate-out. Tables 3 and 6 of the calculations provide RADTRAD results for the MSIV leakage source term.	elemental iodine deposition, the natural removal efficiency for elemental iodine in each steam line volume is assumed to be 50% as recommended in AEB 98-03, Appendix B. This treatment of elemental iodine includes the re-suspension and fixation of elemental iodine from the pipe surface. The mechanism for elemental iodine removal is due to chemical adsorption and is independent of surface orientation. Therefore, consideration of vertical piping for elemental iodine deposition is appropriate. Section 8.1 of the calculations provided in Attachments 8 and 9 provide the results for the MSIV leakage pathway.
9/15/03	In the analyses, was the adsorber and particulate filter efficiencies reduced to account for the 1% bypass flow associated with the SGTS? (Pg 5.5-7 DNPS, Pg 5.5-x QCNPS, Pg 25)	The efficiencies credited are within the maximum values permitted in accordance with Table 1 of Revision 3 to Regulatory Guide 1.52. The bypass flow associated with the SGT System remains unchanged. The LOCA analysis assumed a 50% efficiency.	The current Technical Specifications for DNPS and QCNPS specify a penetration acceptance criteria of < 1.0% for the inplace test of the SGTS HEPA filters and charcoal adsorbers. EGC recognizes that this is not consistent with the guidance in Regulatory Guide 1.52, Revision 2, and is committing to submit a separate license amendment request to revise the DNPS and QCNPS Technical Specifications to change the acceptance criteria to < 0.05%. Although the current Technical Specification acceptance criteria is not consistent with the guidance of Regulatory Guide 1.52, Revision 2, the AST analyses bound the current Technical Specification acceptance criteria.
9/15/03	Exclusion Area Boundary X/Q values should be used with a sliding two hour window to determine the start of the maximum time interval for the EAB dose. Was such a window used for DNPS and QCNPS?	The exclusion area boundary dose is determined for the worst 2-hour X/Q. RADTRAD determines the maximum 2-hour window for exclusion area boundary dose. For DNPS and QCNPS, this period begins at	A sliding window is used to determine the start of the maximum time interval for the EAB dose. Table 9 of Attachments 18 and 19 for DNPS and QCNPS, respectively, lists the time when the maximum EAB dose occurs.

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		T = 4 hours and ends at T = 6 hours.	
9/15/03	Is the assumed control room envelope inleakage in the analyses 600 cfm through the CRE boundary, 600 cfm through control room ventilation system components and 10 cfm due to ingress/egress or 600 cfm in total from the CRE boundary, all control room ventilation system components and ingress and egress?	The unfiltered inleakage value to the control room envelope is through unidentified sources and is assumed to be 600 cfm total, which includes 10 cfm for ingress and egress.	The revised analyses assume 400 cfm inleakage through the CRE boundary through unidentified sources. The 400 cfm includes 10 cfm for ingress and egress.
9/15/03	What activity level is assumed in the steam released during the MSLB accident? (Pg 38)	The activity levels assumed during the MSLB accident were provided in Reference 1, Attachment A, Table 6. These values correspond to the pre-accident spike iodine concentration of 4 µCi/gm I-131 equivalent and the maximum equilibrium iodine concentration of 0.2 µCi/gm I-131 equivalent.	The activity level of the steam released during the MSLB accident has been revised to include cesium and noble gases. The revised analyses, which provide the activity levels of the steam release for the MSLB accident, are provided in Attachments 6 and 7 for DNPS and QCNPS, respectively. The revised analyses provide the activity levels. The activity levels correspond to the pre-accident spike iodine concentration of 4 µCi/gm I-131 equivalent and the maximum equilibrium iodine concentration of 0.2 µCi/gm I-131 equivalent. The revised analyses also assumed a bounding 140,000 lb reactor coolant liquid discharge through the break. The activity levels with these considerations are provided in the attached analyses.
9/15/03	Provide the basis for assuming credit for the offgas system for the removal of xenon, iodine and krypton isotopes resulting from a rod drop accident. (Pg 39, Pg 41)	See response to NRC request 9 under Section IV, "Attachment A." The scenario that credited AOG operation was not analyzed because it was qualitatively determined to be bounded by the low power CRDA pathway with the release through the mechanical vacuum pump and station chimney.	See below for Revised Response to 9/22/04 RAI related to the scenarios considered for the revised CRDA analyses.
9/22/04	The staff has reviewed Updated Final Safety Analysis Report (UFSAR) Section 12A.3, Section 6.4.2.5 and Dresden Section	Exelon Generation Company, LLC (EGC) has performed a calculation to determine the shine dose to DNPS control room operators	The revised LOCA calculations (i.e., Attachments 8 and 9) evaluated the shine does to the control room operators, using the

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	12.3.2.2.4 and has concluded that the shine dose to the control room operators needs to incorporate Regulatory Guide (RG) 1.183 isotopes. Please revise the shine dose to control room operators to include the RG 1.183 isotopes.	following a loss-of-coolant accident (LOCA). This calculation uses the 60-isotope library (i.e., Regulatory Guide 1.183 isotopes) from the RADTRAD computer code for the evaluation of dose consequences. The results of the calculation conclude that the total TEDE dose due to direct shine from the reactor building is 105.1 mrem. In Reference 2, EGC stated that the dose from external sources is expected to be much less than 0.5 rem TEDE. As stated above, the results of the calculation for DNPS conclude that the total TEDE dose due to direct shine from the reactor building is 105.1 mrem. Due to the similarities between DNPS and QCNPS, the assumption that the dose from external sources is expected to be much less than 0.5 rem TEDE for QCNPS is justified. Additionally, Reference 2 stated that the post-LOCA control room doses were 4.53 rem and 3.9 rem for DNPS and QCNPS, respectively. With the additional 105.1 mrem due to direct shine from the reactor building, the post-LOCA control room doses remain below the regulatory limit of 5 rem TEDE.	RG 1.183 isotopes. The results are provided in Section 8.1 of the LOCA calculations.
9/22/04	The September 15, 2003, response to this request indicates that inleakage during the normal mode of operation will be lower than during the filtration mode and explains why inleakage through dampers and in ducts would be less than during normal operation. However, the response does not address inleakage through the four walls, ceiling and floor and why it would be less during normal operation than it would during the emergency	The four walls, ceiling, and floor provide a substantial barrier. Inleakage through these structures is not anticipated to change appreciably between the normal and emergency modes of operation. In the normal mode of operation, all air intakes are unfiltered. For this reason, a tracer gas test was not performed in the normal mode. Adjacent area ventilation systems were aligned in configurations to maximize	See above Comments/Revised Response related to operation of the control room ventilation system in the normal mode.

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	mode of operation. Has it been confirmed through measurements that the inleakage characteristics of the Dresden and Quad Cities control rooms will remain the same when the normal ventilation systems are operating. Did such measurements account for adjacent area ventilation systems being configured in their accident mode of operation while the control room ventilation systems remain in their normal mode of operation. Based upon the information provided in the December 9, 2003, letter responding to Generic Letter 2003-01, does the operation of the Quad Cities control room ventilation system Train B isolate on the same signals which isolate Train A? If it does not, what signals does it isolate on and is one train more limiting than the other with respect to the time of exposure to the control room operators?	inleakage potential with the control room ventilation system in the emergency mode. Additionally, the 600 cfm unfiltered inleakage value is also assumed in the normal mode until the emergency mode is in operation. This value is assumed during the entire event, regardless of the mode. The QCNPS Train B control room ventilation isolates on the same signals that isolate Train A.	
9/22/04	The September 15, 2003, response to NRC Request 8 has not provided an adequate basis for the assumed value for inleakage during the time period in which normal ventilation system is operating. The inleakage characteristics of the control room envelope (CRE) while the normal control room ventilation system is operating will be a function of the pressures established in the areas adjacent to the CRE and in those areas where the control room ventilation systems are located. The CRE inleakage will also be affected by the control room ventilation system ductwork pressures and the pressures in the rooms in which the ductwork passes and by the pressures in the ductwork of the	The control room's normal ventilation system is not in operation during accident situations except during the switchover period from the normal mode of operation to the emergency mode of operation. During this period, full-flow, unfiltered conditions are assumed. As stated in Reference 1, tracer gas testing was not performed in the normal mode of Control Room Emergency Ventilation (CREV) system operation. However, the inleakage during the normal mode would be lower than during the filtration mode for the reasons described in EGC's response to NRC Request 7 in Reference 1. Inleakage values determined through tracer gas testing in the filtration mode were provided in Reference 1.	The control room's normal ventilation system is not in operation during accident situations except during the switchover period from the normal mode of operation to the emergency mode of operation. During this period, full-flow, unfiltered conditions are assumed, plus an additional 2000 cfm unfiltered inleakage for conservatism. Tracer gas testing was not performed in the normal mode of Control Room Emergency Ventilation (CREV) system operation. However, sensitivity studies have been performed that demonstrate that control room doses remain within acceptable limits when assuming 60,000 cfm of unfiltered inleakage during the first 40 minutes following a LOCA.

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	non-control room ventilation systems which traverse the control room envelope. There appears to have been no confirming measurement that the value of 600 cfm represents the performance characteristics of the control room's normal ventilation system under accident conditions nor is it certain that the limiting condition for that particular mode of operation has been identified. Guidance on the determination of limiting conditions may be found in RG 1.197. Provide confirmation that 600 cfm is the limiting inleakage value with the control room's normal ventilation system is operating.	Based on these test results, the assumed inleakage value of 600 cfm is justified.	Inleakage values have been determined through tracer gas testing in the filtration mode. Based on these test results, the assumed inleakage value of 400 cfm, following manual initiation of the CREV system, is justified.
9/22/04	The accident analyses which involve HEPA filters and charcoal adsorbers with an approved 1% allowable bypass for the in-place test should account for the reduction in filter and adsorber efficiency by reducing the effective filtration and adsorption rates. Your dose consequence methodology should account for the 1% bypass. Please provide revised dose assessments for those accidents which assume filtration and adsorption to reduce the consequences of an accident and for which the filter or adsorber providing such a mitigating affect has an allowable 1% penetration for the in-place filter or charcoal adsorber test.	The 1% in-place test (i.e., particulate) bypass flow is accounted for by using an efficiency of 99% per Regulatory Guide 1.52. The charcoal adsorbers are tested in a laboratory using approved methods with a safety factor of 2 which bounds the 1% bypass flow. Therefore, the existing dose assessments are acceptable.	The current Technical Specifications for DNPS and QCNPS specify a penetration acceptance criteria of < 1.0% for the inplace test of the SGTS HEPA filters and charcoal adsorbers. EGC recognizes that this is not consistent with the guidance in Regulatory Guide 1.52, Revision 2, and is committing to submit a separate license amendment request to revise the DNPS and QCNPS Technical Specifications to change the acceptance criteria to < 0.05%. Although the current Technical Specification acceptance criteria is not consistent with the guidance of Regulatory Guide 1.52, Revision 2, the AST analyses bound the current Technical Specification acceptance criteria.
9/22/04	It does not appear that the September 15, 2003, response answered the staff's RAI. Information was requested which asked, "Would the augmented offgas (AOG) system continue to operate in the event of a CRDA?" The answer appears to be "No".	There were three scenarios considered for the control rod drop accident (CRDA) analyses. All three assumed the reactor was in the startup/power ascension mode. The first scenario assumes the mechanical vacuum pump (MVP) is in operation for	The two scenarios considered for the revised control rod drop accident (CRDA) analyses (i.e., Attachments 2 and 3 for DNPS and QCNPS, respectively) are based on the scenario guidance from NEDO-31400A, the October 1992 "Safety Evaluation for

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	A review of the UFSAR has led the staff to conclude that since the main steam line radiation monitor (MSLRM) trip function and the main steam line (MSL) isolation functions have been removed for all modes of operation except during the operation of the mechanical vacuum pump, the AOG will continue to operate unless the radioactivity exceeds the limit established in accordance with the offsite dose calculation manual (ODCM). If that limit is exceeded, the holdup line of the off-gas system is automatically isolated after a 15-minute delay. From UFSAR Section 10.4.2.5, it appears that the AOG is isolated as noted above but that the steam jet air ejector is not isolated. Section 10.4.3 of the UFSAR indicates that the holdup of the offgas provides sufficient time between detection and isolation to prevent release. From this description, it appears that the AOG will be isolated. If this is true, then question becomes, "What happens to the radioactivity following a CRDA if the AOG is isolated?"	condenser vacuum. Gland sealing (GS) steam flow is in operation. Main steam line radiation monitor (MSLRM) high alarms in the control room within seconds. MSLRM high-high radiation initiates MVP shutdown within seconds. In this scenario, 0.15% of the activity is released through the GS condenser to the station chimney with no delay. No AOG operation is assumed. The balance of activity is released from the condenser at a rate of 1% volume per day for 24 hours as a ground level release. The dose for this scenario was not calculated since this is bounded by the second scenario, described below, which has a significantly larger and quicker release. The second scenario also assumes the MVP and GS are in operation. There is possibly a MSLRM high radiation alarm in the control room. The MSLRM high-high radiation setpoint is not reached, thus there is no automatic MVP trip. The reactor trip and other neutron instrument responses alert operators of the CRDA. In response to MSLRM alarms and other indications, the operator trips the MVP within 10 minutes. Again, 0.15% of the activity is released through the GS condenser to the station chimney with no delay. No AOG operation is assumed. The activity is exhausted at high flow from the condenser through the station chimney using the MVP for 10 minutes before manual isolation. The balance of activity is released from the condenser at a rate of 1% volume per day for 24 hours as a ground level release. The third scenario assumes the GS and steam jet air ejectors are in operation. There	Eliminating the BWR MSIV Closure Function and Scram Function of the MSLRM." Both scenarios assumed the reactor was in the startup/power ascension mode, and that the mechanical vacuum pump (MVP) is not in operation. Main steam line radiation monitor (MSLRM) high alarms in the control room within seconds. MSLRM high-high radiation initiates MVP shutdown within seconds. Both scenarios assume gland sealing (GS) steam flow is in operation, with 0.15% of the activity released through the GS condenser to the station chimney with no delay, and with all of the activity that reaches the GS condenser assumed to be available for such release to the environment. In one scenario, the balance of activity is released from the condenser at a rate of 1% volume per day for 24 hours as a ground level release. The other scenario assumes the GS and steam jet air ejectors are in operation, again with 0.15% of the activity released through the GS condenser to the station chimney with no delay and all of the activity reaching the GS condenser assumed to be available for such release to the environment, plus activity from the main condenser exhausted through the AOG system, minimizing iodine releases and delaying noble gas releases for decay. If an offgas high-high radiation signal is received, the chimney isolation and holdup volume drain valves automatically close after a 15-minute delay. Isolation of the offgas system will result in a loss of main condenser vacuum due to the inability to remove non-condensables from the main condenser.

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		is no dependence on MSLRM response. In this scenario, 0.15% of the activity is released through the GS condenser to the station chimney with no delay. Activity from the condenser is exhausted through the AOG system, minimizing iodine releases and delaying noble gas releases for decay. Dose implications were not calculated for this scenario since it is bounded by the second scenario, since the second scenario assumes a significantly quicker release and includes iodines. If an offgas high-high radiation signal is received, the chimney isolation and holdup volume drain valves automatically close after a 15-minute delay. Isolation of the offgas system will result in a loss of main condenser vacuum due to the inability to remove non-condensables from the main condenser. The activity will then be released from the condenser at a rate of 1% volume per day for 24 hours as a ground level release. In this case, the dose consequences would be bounded by the second scenario.	As noted in the question, it is expected that all pathways for releases through the AOG system following a CRDA will be isolated, and that any radioactivity otherwise available for release will be retained within the AOG system; however, a continuation of the AOG release by steam jet air ejector operation is assumed in this scenario for conservatism.
11/5/04	What are the inputs, including height of wind measurements and offsite terrain heights, for the exclusion area boundary and low population zone relative concentration estimates from postulated elevated releases? Regulatory Guide 1.145, "Atmospheric Dispersion Models for Potential Consequence Assessments at Nuclear Power Plants," states that "... the maximum terrain height above plant grade between the release point and the point for which the calculation is made ..." is an input to the elevated release	The wind data used in the determination of X/Qs for elevated releases with respect to the EAB and LPZ are those from the upper elevation of the meteorological monitoring tower (i.e., 300 feet at DNPS and 296 feet at QCNPS). A terrain height factor of 1 was used in the calculations since the terrain surrounding each station is essentially flat. No terrain difference is specified between plant grade and EAB and LPZ receptors.	The X/Q calculations have been revised to consider terrain effects for the EAB X/Q values for the Station Chimney release pathway and the effects of stack downwash. Additional information, including the results of a bounding sensitivity analysis that was performed to evaluate the terrain effects for the LPZ X/Q values, is provided in the response to NRC Request 7 (i.e., Attachment 1). The revised X/Q calculations for DNPS and QCNPS are provided in Attachments 16 and 17, respectively.

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	calculations. This information did not appear to be on the compact disk providing other data.		

ATTACHMENT 23
Summary of Regulatory Commitments

The following tables identify commitments being made by Exelon Generation Company, LLC (EGC). Any other actions discussed in this letter represent intended or planned actions by EGC. They are described for the NRC's information and are not regulatory commitments.

	Commitment	Committed Date or Outage
1	The current Technical Specifications for DNPS and QCNPS specify a penetration acceptance criteria of < 1.0% for the inplace test of the Standby Gas Treatment System HEPA filters and charcoal adsorbers. EGC will submit a separate license amendment request to revise the Dresden Nuclear Power Station (DNPS) and Quad Cities Nuclear Power Station (QCNPS) Technical Specifications to change the acceptance criteria to < 0.05%.	Within six months of NRC approval of the alternative source term license amendment request
2	The following guidelines will be included in the assessment of systems removed from service during movement of irradiated fuel: – During fuel handling/core alterations, ventilation system and radiation monitor availability (as defined in NUMARC 91-06) will be assessed, with respect to filtration and monitoring of releases from the fuel. Following shutdown, radioactivity in the fuel decays away fairly rapidly. The basis of the Technical Specification operability amendment is the reduction in doses due to such decay. The goal of maintaining ventilation system and radiation monitor availability is to reduce doses even further below that provided by the natural decay. – A single normal or contingency method to promptly close primary or secondary containment penetrations will be developed. Such prompt methods need not completely block the penetration or be capable of resisting pressure. The purpose of the "prompt methods" mentioned above are to enable ventilation systems to draw the release from a postulated fuel handling accident in the proper direction such that it can be treated and monitored.	Upon implementation of the approved alternative source term license amendment