NAI Report Release

Report Number: NAI-1149-002

Revision Number: 0

Title: Determination of Atmospheric Dispersion Factors for Palisades

Description:

Determines atmospheric dispersion χ/Q factors for various release scenarios at the Palisades site.

Author
Joe Sinodis

Sept. 15, 2004
Date

Reviewer
Steve Thomasson

9/15/04
Date

NAI Management
Jim Harrell

9/15/04
Date

NAI Calculation Approval

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Joe Sinodis — Sept. 15, 2004

Author — Date

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Scope of Review:

All spreadsheets used for manipulating the met. data were spot checked. All of the PAVAN and ARCON runs were checked against the spreadsheets to ensure that the met. data were properly transferred. The case specific input for all of the PAVAN and ARCON cases was checked against the referenced design inputs to ensure that the case data were input properly. The data provided in the IAM were presumed to be correct; therefore, these data were not verified. The methodology presented in the body of the calculation was compared to the referenced guidelines and was found to be correct.

Design Verification –

The only comments were related to typographical errors. A marked up copy was provided to the preparer for correction.

Steven G. Thomasson — 9/15/04

Reviewer — Date

Steve Thomasson

Check items in the following lists to verify that project documentation and engineering calculations are complete. Mark any items that are not applicable with N/A notation.

Project Documentation Checklist:

N/A

- ☐ Project QA Plan.
- ☐ Project Organization.
- ☐ Project Work Scope and Design Plan.
- ☐ Project Calculation and Document Index.
- ☐ Project QA Requirements.
- ☐ Project Engineer Training and Qualification Forms.
- ☐ Project QA Training Certification Forms.
- ☐ Project Correspondence.

Engineering Calculations Checklist:

- ☑ Identification by subject, originator, reviewer, date and Project so that the calculation is retrievable.
- ☑ Table of contents.
- ☑ Statement of the objective of the analysis.
- ☑ Analysis inputs and their sources.
- ☑ Assumptions and how they were developed or determined.
- ☑ Hand calculations.
- ☑ Identification of computer calculations, including computer type, computer program name and version, code input and output.
- ☑ Conclusions.
- ☑ Review summary.
- ☑ Responses to review comments.
- ☑ References.
- ☑ Each page of the calculation shall be numbered and the first page shall indicate the total number of pages. The calculation pages may be numbered by sections with the first page of the section indicating the total number of pages in the section.
- ☑ The Calculation Approval Sheet shall be signed and dated by the originator.

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PURPOSE

The purpose of this analysis is to determine new χ/Q atmospheric dispersion factors for the Palisades plant for various release scenarios. Onsite atmospheric dispersion factors are generated for the control room air intakes for several dose events that include Loss of Coolant Accident (LOCA) or Maximum Hypothetical Accident (MHA), Main Steam Line Break (MSLB), Steam Generator Tube Rupture (SGTR), Fuel Handling Accident (FHA), Control Rod Ejection (CRE), Volume Control Tank Rupture (VCTR), Small Line Break Outside Containment, Cask Drop, and Waste Gas Decay Tank rupture (WGDT). Offsite atmospheric dispersion factors are determined at the Exclusion Area Boundary (EAB) and inside edge of the Low Population Zone (LPZ).

RESULTS, CONCLUSIONS AND RECOMMENDATIONS

RESULTS

The following table lists the results from the various cases run for the onsite χ/Q atmospheric dispersion factors. Figure 1 provides a sketch of the general layout of the Palisades release and receptor locations.

TABLE 1 – Base χ/Q Factors from ARCON96 Runs

Case	Release Point	Receptor Point	0-2 hr χ/Q	2-8 hr χ/Q	8-24 hr χ/Q	1-4 days χ/Q	4-30 days χ/Q
1	Containment Closest Point	Normal Intake 'A'	1.14E-02	9.00E-03	3.27E-03	2.61E-03	2.07E-03
2	Containment Closest Point	Normal Intake 'B'	1.43E-02	1.11E-02	4.13E-03	3.23E-03	2.49E-03
3	Containment Closest Point	Emergency Intake	7.26E-04	6.18E-04	2.47E-04	1.77E-04	1.30E-04
4	SIRWT Vent	Normal Intake 'A'	5.55E-02	4.35E-02	1.54E-02	1.25E-02	1.01E-02
5	SIRWT Vent	Normal Intake 'B'	9.57E-02	7.59E-02	2.87E-02	2.19E-02	1.65E-02
6	SIRWT Vent	Emergency Intake	9.66E-04	7.92E-04	3.13E-04	2.20E-04	1.64E-04
7	Plant Stack	Normal Intake 'A'	5.83E-03	4.16E-03	1.55E-03	1.19E-03	9.09E-04
8	Plant Stack	Normal Intake 'B'	6.10E-03	4.32E-03	1.73E-03	1.27E-03	9.79E-04
9	Plant Stack	Emergency Intake	8.32E-04	7.69E-04	2.83E-04	2.15E-04	1.57E-04
10	Closest ADV	Normal Intake 'A'	1.65E-02	1.34E-02	5.40E-03	4.03E-03	2.98E-03
11	Closest ADV	Normal Intake 'B'	1.58E-02	1.30E-02	5.12E-03	3.65E-03	2.71E-03
12	Closest ADV	Emergency Intake	7.36E-04	6.42E-04	2.43E-04	1.75E-04	1.28E-04
13	Closest SSRV	Normal Intake 'A'	2.10E-02	1.70E-02	6.80E-03	4.98E-03	3.72E-03
14	Closest SSRV	Normal Intake 'B'	2.11E-02	1.71E-02	6.91E-03	4.90E-03	3.65E-03
15	Closest SSRV	Emergency Intake	7.96E-04	6.91E-04	2.60E-04	1.90E-04	1.37E-04

Case	Release Point	Receptor Point	0-2 hr χ/Q	2-8 hr χ/Q	8-24 hr χ/Q	1-4 days χ/Q	4-30 days χ/Q
16	Containment Equipment Door	Normal Intake 'A'	9.40E-03	7.36E-03	2.72E-03	2.12E-03	1.72E-03
17	Containment Equipment Door	Normal Intake 'B'	1.25E-02	9.83E-03	3.62E-03	2.86E-03	2.28E-03
18	Containment Equipment Door	Emergency Intake	7.32E-04	6.13E-04	2.45E-04	1.75E-04	1.29E-04
19	Turbine Building NE Roof Exhauster	Normal Intake 'A'	1.31E-02	1.13E-02	4.68E-03	2.87E-03	2.36E-03
20	Turbine Building NE Roof Exhauster	Normal Intake 'B'	9.09E-03	8.14E-03	3.43E-03	2.02E-03	1.74E-03
21	Turbine Building NE Roof Exhauster	Emergency Intake	7.92E-04	6.43E-04	2.58E-04	1.74E-04	1.30E-04
22	Turbine Building NW Roof Exhauster	Normal Intake 'A'	1.10E-02	1.02E-02	4.33E-03	2.58E-03	2.17E-03
23	Turbine Building NW Roof Exhauster	Normal Intake 'B'	8.20E-03	7.06E-03	3.09E-03	1.80E-03	1.57E-03
24	Turbine Building NW Roof Exhauster	Emergency Intake	7.99E-04	6.43E-04	2.57E-04	1.75E-04	1.32E-04

The results for the offsite atmospheric dispersion factors for the EAB and LPZ are presented in the following tables. In accordance with Regulatory Position 4 from Reference [4], the maximum value from all downwind sectors for each time period is compared with the 5% overall site χ/Q, and the larger of the values are used in evaluations. Note that the EAB distance in the limiting NNW direction is offshore. However, this distance is used in all directions and the NNW result is used for conservatism.

TABLE 2 – EAB χ/Q Factors from PAVAN Run

Time Period	Maximum Downwind χ/Q (sec/m^3)	Maximum Downwind χ/Q Direction	5% overall site χ/Q (sec/m^3)
0-2 hours	5.39E-04	NNW	3.67E-04
0-8 hours	3.31E-04	NNW	2.40E-04
8-24 hours	2.59E-04	NNW	1.94E-04
1-4 days	1.53E-04	NNW	1.23E-04
4-30 days	7.14E-05	NNW	6.33E-05

TABLE 3 – LPZ χ/Q Factors from PAVAN Run

Time Period	Maximum Downwind χ/Q (sec/m^3)	Maximum Downwind χ/Q Direction	5% overall site χ/Q (sec/m^3)
0-2 hours	6.66E-05	NNW	4.30E-05
0-8 hours	3.03E-05	NNW	2.10E-05
8-24 hours	2.04E-05	NNW	1.47E-05
1-4 days	8.67E-06	NNW	6.76E-06
4-30 days	2.54E-06	NNW	2.21E-06

CONCLUSIONS

The following table summarizes the results for χ/Q factors for the control room intakes for the various release/receptor combinations. The results for the limiting receptor point for the normal intake and the emergency intake are presented in the table below, and may be used for onsite control room dose consequence analyses. Based on the layout of the plant and the intake configuration no credit for dilution due to dual intakes is allowed.

TABLE 4 – Control Room χ/Q Factors for Analysis Events

Release Point	Receptor Point	0-2 hr χ/Q	2-8 hr χ/Q	8-24 hr χ/Q	1-4 days χ/Q	4-30 days χ/Q
Containment Closest Point	Normal Intake 'B'	1.43E-02	1.11E-02	4.13E-03	3.23E-03	2.49E-03
Containment Closest Point	Emergency Intake	7.26E-04	6.18E-04	2.47E-04	1.77E-04	1.30E-04
SIRWT Vent	Normal Intake 'B'	9.57E-02	7.59E-02	2.87E-02	2.19E-02	1.65E-02
SIRWT Vent	Emergency Intake	9.66E-04	7.92E-04	3.13E-04	2.20E-04	1.64E-04
Plant Stack	Normal Intake 'B'	6.10E-03	4.32E-03	1.73E-03	1.27E-03	9.79E-04
Plant Stack	Emergency Intake	8.32E-04	7.69E-04	2.83E-04	2.15E-04	1.57E-04
Closest ADV	Normal Intake 'A'	1.65E-02	1.34E-02	5.40E-03	4.03E-03	2.98E-03
Closest ADV	Emergency Intake	7.36E-04	6.42E-04	2.43E-04	1.75E-04	1.28E-04
Closest SSRV	Normal Intake 'A'	-	-	-	4.98E-03	3.72E-03
Closest SSRV	Normal Intake 'B'	2.11E-02	1.71E-02	6.91E-03	-	-
Closest SSRV	Emergency Intake	7.96E-04	6.91E-04	2.60E-04	1.90E-04	1.37E-04
Containment Equipment Door	Normal Intake 'B'	1.25E-02	9.83E-03	3.62E-03	2.86E-03	2.28E-03
Containment Equipment Door	Emergency Intake	7.32E-04	6.13E-04	2.45E-04	1.75E-04	1.29E-04

Release Point	Receptor Point	0-2 hr χ/Q	2-8 hr χ/Q	8-24 hr χ/Q	1-4 days χ/Q	4-30 days χ/Q
Turbine Building NE Roof Exhauster	Normal Intake 'A'	1.31E-02	1.13E-02	4.68E-03	2.87E-03	2.36E-03
Turbine Building NE Roof Exhauster	Emergency Intake	-	-	2.58E-04	-	-
Turbine Building NW Roof Exhauster	Emergency Intake	7.99E-04	6.43E-04	-	1.75E-04	1.32E-04

The following table summarizes the maximum χ/Q factors for the EAB and LPZ.

TABLE 5 – Offsite Boundary χ/Q Factors for Analysis Events

Time Period	EAB χ/Q (sec/m^3)	LPZ χ/Q (sec/m^3)
0-2 hours	5.39E-04	6.66E-05
0-8 hours	3.31E-04	3.03E-05
8-24 hours	2.59E-04	2.04E-05
1-4 days	1.53E-04	8.67E-06
4-30 days	7.14E-05	2.54E-06

RECOMMENDATIONS

It is recommended that the limiting χ/Q atmospheric dispersion factors for the control room, EAB, and LPZ presented in the Conclusions section be used for dose analyses for the events at the Palisades plant. Future analysis of events other than those studied in this project (i.e. NAI 1149) may require different release-receptor combinations to determine the bounding scenario.

ASSUMPTIONS AND DESIGN INPUTS

1. It is assumed that the Palisades meteorological program conforms to Reference [2].
2. Distances, directions, and elevations for onsite atmospheric dispersion factors are taken from References [7], [12], [13] and [15], which are compiled in Attachment D.
3. All releases are considered ground level releases since there are no release points higher than 2.5 times the tallest surrounding structure as put forth by References [1] and [4].
4. The actual release height is used when known based on the guidance from Table A-2 of Reference [1] for the onsite cases.
5. If a release elevation is unknown for onsite releases, the release height is set equal to the intake height as called out in Table A-2 of Reference [1].
6. The stack top elevation is assumed to be the release height for releases from the plant stack for the onsite cases because no credit is taken for an effective height due to plume rise.
7. The default value in ARCON96 for surface roughness length is changed to 0.2 based on guidance from Table A-2 of Reference [1].
8. The default value in ARCON96 for the averaging sector width constant is changed to 4.3 based on guidance from Table A-2 of Reference [1].
9. The minimum EAB distance assumed for all directions is 677 m from Section 2.1 of Reference [9].
10. The LPZ distance is taken from Section 2.1 of Reference [9] as 4,820 m in all directions.
11. All other inputs and assumptions are listed in the Computations section of this calculation.

METHODOLOGY

ARCON96 and PAVAN are used to determine onsite control room dispersion factors and offsite Exclusion Area Boundary (EAB) and Low Population Zone (LPZ) dispersion factors. Annual meteorological data is properly formatted for code input from Reference [14], which is presented in Attachment D. The yearly data for the ARCON96 code is combined into one file, while the data provided for the PAVAN code is formatted using an Excel spreadsheet.

Other inputs are determined for each of the analysis scenarios. These inputs, combined with the meteorological data, are then used with the computer codes to determine the χ/Q atmospheric dispersion factors for each case.

All computer codes were run on a machine with an AMD Athlon processor using the Windows 98 operating system. The ARCON96 and PAVAN codes are qualified for use on this project in Reference [6].

COMPUTATIONS

METEOROLOGICAL DATA

Five years worth of meteorological data was used which meets the guidance set forth in Section 3.1 of Reference [1]. The meteorological data for 1999 through 2003 was provided in electronic format in formatted text files. These files were appended to each other in chronological order to create one file, pal9903.met, to be accessed by ARCON96.

The lower and upper windspeeds were recorded at heights of 10.1 m and 57.8 m, respectively, as listed in Section 2.5.2.3 of Reference [9]. These heights are appropriate to use without any adjustment for the base elevation of the meteorological tower. To verify this several ARCON96 sensitivity cases were run with the meteorological sensor heights at a value of the height on the tower plus the height of the base of the tower that resulted in less conservative results with the Palisades meteorological data set. The description of the input for the sensor height for PAVAN from Table 3.1 of Reference [5] states that the height is above "ground-level." Therefore, the 10.1 m height is appropriate to use for the PAVAN case as well.

The windspeed values were provided in meters per second. Section 4.4.2 of Reference [3] requires the windspeed input to be entered to the nearest tenth of a reporting unit sans the decimal point. The wind directions are provided in degrees from the original format of the meteorological data. The data meets the requirement that a wind from the east is entered as 90º, a wind from the south is entered as 180º, etc. Other information regarding the formatting of the meteorological data file may be found in References [1] and [3].

ARCON96 analyzes the meteorological data file used and lists the total number of hours of data processed and the number of hours of missing data in the case output. A meteorological data recovery rate may be determined from this information. Since all of the Palisades cases use the same meteorological data file, pal9903.met, all of the cases in this analysis have the same data recovery rate. Each of the output listings in Appendix A present the number of hours of data processed as 43,824 and the number of missing data hours as 179. This yields a meteorological data recovery rate of 99.6%. No regulatory guidance is provided in References [1] and [3] on the valid meteorological data recovery rate required for use in determining onsite χ/Q values. However, Regulatory Position C.5 of Reference [2] requires a 90% data recovery threshold for measuring and capturing meteorological data. Clearly, the 99.6% valid meteorological data rate for the cases in this analysis exceeds the 90% data recovery limit set forth by Reference [2]. With a data recovery rate of 99.6% and a total of five years worth of data, the contents of the meteorological data file pal9903.met are representative of the long term meteorological trends at the Palisades site.

The meteorological data were also provided in annual joint frequency distribution format for 1999 through 2003. An Excel spreadsheet was created to merge the five years worth of data into one joint frequency distribution file. The joint frequency distribution file requires the annual meteorological data to be sorted into several classifications. This is accomplished by using three classifications that include wind direction, wind speed, and atmospheric stability class. The format for the original files conform to the format provided in Table 1 of Reference [2]. These data were provided for the five years in terms of the percentage of hours of that time period that fell into each classification category. The percentage of hours are converted to a number of whole hours in the spreadsheet. The final numbers are then copied from the spreadsheet and pasted into the input file for PAVAN. The hours of calm for each stability class were taken from the original data file and included in the PAVAN input file. Other information regarding the joint frequency distribution format for the PAVAN meteorological data may be found in Reference [2].

The meteorological data used in these analyses are provided in electronic format on a compact disk that accompanies this calculation and listed in Attachment C. The disk contains the original meteorological data files for Palisades from 1999 to 2003, the spreadsheets used to manipulate the data, and the final meteorological data files for the ARCON96 and PAVAN runs.

A process was performed on the meteorological data used for the ARCON96 runs to determine the 95th percentile wind speed at the SSRV and ADV release heights. The meteorological data file pal9903.met was opened in an Excel spreadsheet. A column was added to the spreadsheet that contains the lower wind speed value and is set equal to 999 if the wind speed data for that hour is bad. Another column was added to the spreadsheet where the wind speed multiplier is selected based upon the stability class for each hour of data. The final column multiplies the wind speed multiplier by the 10.1 m wind speed to obtain the wind speed at the height of the release.

The wind speed multiplier is selected based upon the stability class, and is taken from special ARCON96 case runs. Case 10, for a release from an ADV to the normal 'A' control room intake, was renamed pal10qa and rerun with the Expanded QA output option selected. This QA file, pal10qa.qao, which is listed in Attachment C, presents the wind speed correction factors for the release height from this case. A review of Reference [3] indicates that the value C2, which is listed in the pal10qa.qao file, is the multiplier based on stability class used on the meteorological lower wind speed data for each hour to determine the wind speed at the release height. The IF function is used in the spreadsheet to select the appropriate C2 value to use as a multiplier on the hourly met data. The release from an SSRV is at the same release height, therefore the 95th percentile wind speed determined using the ADV expanded output case is the same for the SSRV case.

The PERCENTILE function in the spreadsheet program was used to identify all of the hourly release height wind speeds as the range to return the 95th percentile value. Hours with bad data for the lower wind speed or the stability class are neglected. The 95th percentile wind speed for the ADV and SSRV release height is 7.29 meters per second. That is, 95% of all of the hourly wind speeds at the ADV and SSRV release height of 17.37 m are less than 7.29 meters per second.

As mentioned previously, the meteorological data from which this calculation is performed is considered indicative of the meteorological trends at the Palisades site, and the calculated 95th percentile wind speed values for the SSRV and ADV release height may be used with confidence. The spreadsheet, palmetdata.xls, is provided in electronic format on a compact disk, which is listed in Attachment C that accompanies the electronic version of this calculation.

Reference [8] lists the range of dry bulb temperature for various places in the United States. The most similar listed location to the Palisades site is for Muskegon, MI, where the temperature range is 18.1 ºF. It is the second closest listed city to Covert, MI where the Palisades plant is located. However, it is chosen (instead of Grand Rapids which is slightly closer) because it also is on the eastern shore of Lake Michigan. This information is from Table 1b in Chapter 27 of Reference [8].

ONSITE χ/Q DETERMINATION

A number of various release-receptor combinations were considered for the onsite control room atmospheric dispersion factors. These different cases were considered to determine the limiting release-receptor combination for the events. The case matrix for these combinations is provided in the table in the Results section of this calculation. Figure 1 provides a sketch of the general layout of the Palisades release and receptor locations. The .log files for each ARCON96 run completed, which include the input listing and results, are provided in Attachment A. All of the ARCON96 files are provided in electronic format on a compact disk that is listed as Attachment C.

The distance and direction inputs for the ARCON96 runs are taken from and may be found in References [7], [12], [13] and [15], which are listed in Attachment D. The intake heights are also taken from those references, while the elevation difference term is set equal to zero for each case since all elevation points are taken with respect to the same datum.

The file pal9903.met was entered as the meteorological data file for each case run. The lower and upper measurement heights were entered as 10.1 m and 57.8 m, respectively, for each case. The m/s option was selected for the windspeed units.

A ground level release is chosen for each scenario since none of the release points are 2.5 times taller than the closest solid structure as called out in Section 3.2.2 of Reference [1] for stack releases. From Reference [10], the top of the containment structure is at an elevation of 782 ft. The highest release point is from the top of the plant stack at a release height of 58.52 m, or 192 ft for an elevation of 782 ft, as given in Reference [7] in Attachment D, which is clearly not 2.5 times higher than the containment structure. The vertical velocity, stack flow, and stack radius terms are all set equal to zero since each case is a ground level release. The vent release option was not selected for any of the scenarios based on the guidance set forth in Section 3.2.3 of Reference [1].

The actual release heights from the references in Attachment D are used in the cases. For the releases from the plant stack, the release elevations are set equal to the plant stack release elevation from Reference [7] in Attachment D because no credit is taken for effective release height due to plume rise.

The cases in this analysis that take credit for the building wake effect are the scenarios where the release is from the containment building and the SIRWT vent. Some of the other scenarios have buildings between the release and receptor points, but for those cases the building wake is not credited for the sake of conservatism. Not crediting wakes is accomplished by setting the building area term equal to 0.01 m^2 as stated in Table A-2 of Reference [1]. The building area used is a conservatively determined containment cross sectional area. The area is created by the cylindrical portion of the containment structure above the nearby auxiliary building roof. The width used is equal to the diameter of the containment structure. The height of the cylindrical portion is taken as the distance between the top of the cylinder portion of the containment structure and the auxiliary building roof elevation. The calculation of the building area is shown below.

Containment structure inner diameter = 116’ from Section 5.8.2 of Reference [9]
Containment structure nominal wall thickness = 3.5’ from Section 5.8.2 of Reference [9]

Containment structure diameter = ID + 2 x wall thickness
Containment structure diameter = 116’ + 2 x 3.5’
Containment structure diameter = 123 ft

Containment structure top elevation = 782’ from Reference [10]
Distance from top of containment structure to cylinder top elevation = 16’ from Figure 5.8-1, Sh. 1 of Reference [9]
Auxiliary building roof elevation = 643’ from Reference [11]

Containment cylinder top elevation = top elevation – distance to cylinder top
Containment cylinder top elevation = 782' – 16'
Containment cylinder top elevation = 766 ft

Height = Cylinder top elevation – Auxiliary building roof elevation
Height = 766' – 643'
Height = 123 ft

Area = Diameter x Height
Area = 123 ft x 123 ft
Area = 15,129 ft^2 x $(0.3048\ m)^2 / (1\ ft)^2$
Area = 1,405 m^2

The output files for each case were titled palxx.log and palxx.cfd, where xx is a unique identifier for each case run. As stated previously, the .log files are presented in Attachment A.

All of the default values in the ARCON96 code are unchanged from the code default values with a couple of exceptions. Table A-2 of Reference [1] suggests to use a value of 0.2 for the Surface Roughness Length, and to use a value of 4.3 for the Averaging Sector Width Constant. These two changes were made for each case, while the minimum wind speed was left at 0.5 m/s per the guidance instruction in Table A-2 of Reference [1].

OFFSITE χ/Q DETERMINATION

The joint frequency meteorological data is used in the input for the offsite atmospheric dispersion factors. PAVAN requires that a distance be input for each of the 16 directions where offsite χ/Q values are calculated. Section 2.1 of Reference [9] gives the minimum distance to the EAB as 677 m. The regulatory guidance usually uses the term Exclusion Area Boundary (EAB). This term is synonomous with Site Boundary (SB), and either may be used interchangeably in this calculation. Section 2.1 of Reference [9] provides the LPZ boundary distance as 4,820 m. The EAB and LPZ distances are conservatively assumed in all directions.

All of the releases are considered ground level releases because the highest possible release height is at an elevation of 782 ft from the plant stack. From Section 1.3.2 of Reference [4], a release is only considered a stack release if the release point is at a level higher than two and one-half times the height of adjacent solid structures. For the Palisades plant, the elevation of the top of the containment structure is given as 782 ft from Reference [10]. Clearly, the highest possible release point is not 2.5 times higher than the adjacent containment building, and therefore all releases are considered ground level releases. As such, the release height is set equal to 10.0 meters as required by Table 3.1 of Reference [5]. The building area used for the building wake term is larger than the area used for the ARCON96 onsite χ/Q cases. This area of 2,011 m^2 is calculated as the entire containment structure area. Although other plant buildings obstruct some of the containment structure, a point at the EAB or LPZ downwind will notice the effects of an area the size of the containment structure, even though that area is comprised of the containment and the adjacent buildings. This area is calculated below.

Plant grade elevation = 590' from Reference [7] in Attachment D

Height = Cylinder top elevation – Plant grade elevation
Height = 766' – 590'
Height = 176 ft

Area = Diameter x Height
Area = 123 ft x 176 ft
Area = 21,648 ft^2 x $(0.3048\ m)^2 / (1\ ft)^2$
Area = 2,011 m^2

The containment height used in the building wake term is calculated below as the containment top elevation minus the bottom (grade) elevation of 590 ft.

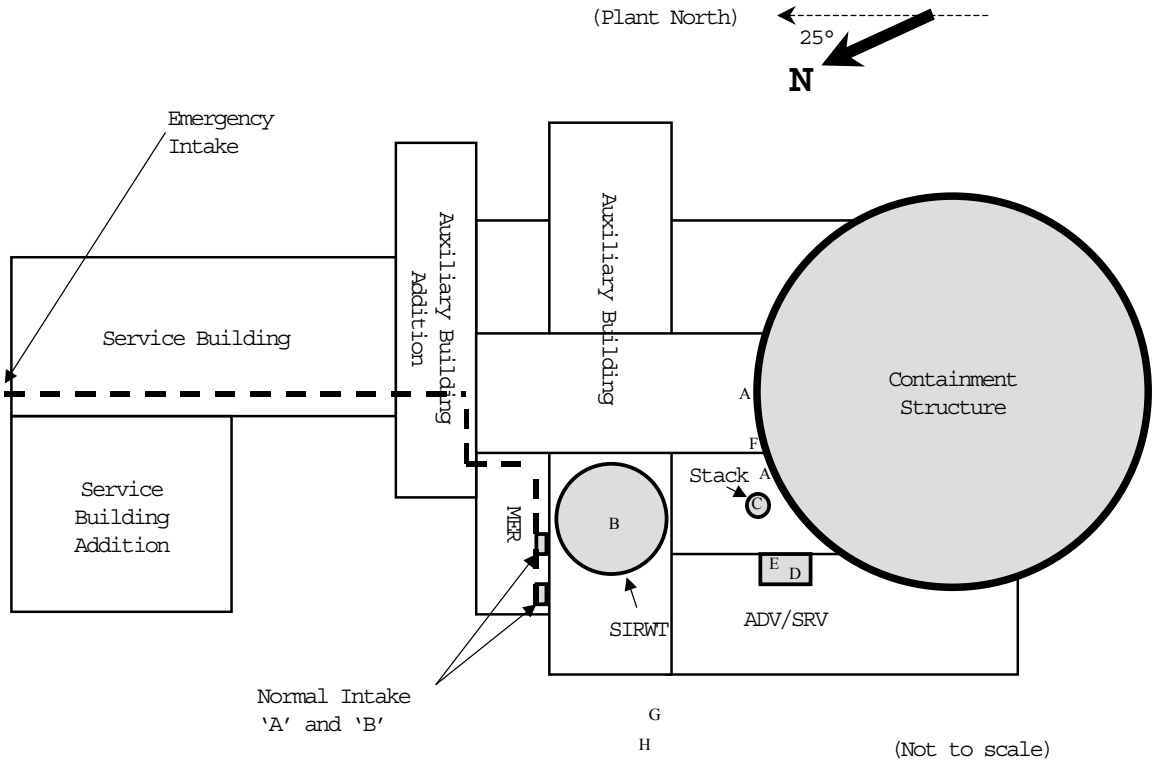
Height = 782 ft – 590 ft = 192 ft
Height = 192 ft x (0.3048 m / 1 ft) = 58.5 m

The tower height at which the wind speeds were measured is 10.1 m. The windspeed units are given in meters per second, therefore the PAVAN variable UCOR is set equal to -1 to not apply any unit corrections as described in Table 3.1 of Reference [5]. The maximum windspeed in each windspeed category is chosen to match the raw joint frequency distribution data, which is provided in electronic format on compact disk and listed in Attachment C. A windspeed of 0.1 meters per second was assumed for the lowest wind speed category which the calms are distributed into.

The PAVAN case run is titled pals01, and may be found in Attachment B. This file lists an input echo followed by the calculation details and output for the determination of the χ/Q values for the EAB and LPZ boundaries. A maximum χ/Q value was determined from the output for each of the appropriate downwind distances as listed in the table above. The maximum downwind distance results for the EAB and LPZ boundaries are compared with the 5% overall site values for those boundaries. The electronic version of the PAVAN file is found on the compact disk listed as Attachment C. The PAVAN input file is identified as palsinput.dat.

REFERENCES

1. Regulatory Guide 1.194, “Atmospheric Relative Concentrations for Control Room Radiological Habitability Assessments at Nuclear Power Plants,” U. S. NRC, June 2003.
2. Regulatory Guide 1.23, “Onsite Meteorological Programs,” U. S. NRC, February 1972.
3. NUREG/CR-6331, “Atmospheric Relative Concentrations in Building Wakes,” Rev. 1 May 1997 with associated Errata July 1997.
4. Regulatory Guide 1.145, “Atmospheric Dispersion Models for Potential Accident Consequence Assessments at Nuclear Power Plants,” Rev. 1, U. S. NRC, February 1983.
5. NUREG/CR-2858, PNL-4413, “PAVAN: An Atmospheric Dispersion Program for Evaluating Design Basis Accidental Releases of Radioactive Materials from Nuclear Power Stations,” November 1982.
6. NAI-PQAP-1149-0, “Project Quality Assurance Plan for Control Room Habitability Analyses at Consumers Energy Palisades Nuclear Plant,” Rev. 0.
7. Email from Gary Pratt (Palisades) to Joe Sinodis (NAI), “X/Q Input Data,” with attachment, June 23, 2004.
8. 2001 ASHRAE Fundamentals (IP Edition), American Society of Heating, Refrigerating, and Air-Conditioning Engineers, Inc.
9. FSAR – Palisades Nuclear Plant, Revision 24.
10. Drawing M-7, “Equipment Location Reactor Building Section F-F,” Rev. 11.
11. Dwg. C-539(Q), “Cellular Slab Repair Plan of Control Room Roof El 643’-0’’ Palisades Plant,” Rev. 0.
12. Email from Gary Pratt (Palisades) to Joe Sinodis (NAI), “RE: Remaining X/Qs,” with attachment, June 29, 2004.
13. Email from Gary Pratt (Palisades) to Joe Sinodis (NAI), “Re: Fax,” with attachment, June 28, 2004.
14. Email from Gary Pratt (Palisades) to Jim Harrell (NAI), “ARCON96 data,” with attachment, March 3, 2004.
15. Email from Gary Pratt (Palisades) to Joe Sinodis (NAI), “MSLB X/Q Data,” with attachment, September 14, 2004.



* – Control Room Intakes / Receptor Point
A – Containment Closest Point
B – SIRWT Vent
C – Plant Stack
D – Closest ADV
E – Closest SSRV
F – Equipment Door
G – Turbine Building NE Roof Exhauster
H – Turbine Building NW Roof Exhauster

Figure 1 – Onsite Release/Receptor Location Sketch

ATTACHMENT A

ARCON96 Case Runs – .log files

pal01.log

```
 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.

 NRC Contacts:   J. Y. Lee       Phone: (301) 415 1080
                                 e-mail: jyl1@nrc.gov
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                                 e-mail: jjh@nrc.gov
                 L. A  Brown     Phone: (301) 415 1232
                                 e-mail: lab2@nrc.gov

 Code Developer: J. V. Ramsdell  Phone: (509) 372 6316
                                 e-mail: j_ramsdell@pnl.gov

 Code Documentation:  NUREG/CR-6331 Rev. 1

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 employees, makes any warranty, expressed or implied, or assumes any legal
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 use, of any portion of this program or represents that its use by such third
 party would not infringe privately owned rights.

 Program Run   6/24/2004  at  11:47:04

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

     Number of Meteorological Data Files  =  1
     Meteorological Data File Names
       C:\ARCON96\PAL\PAL9903.MET

     Height of lower wind instrument (m)  =     10.1
     Height of upper wind instrument (m)  =     57.8
     Wind speeds entered as meters/second

     Ground-level release
     Release height (m)                   =     22.5
     Building Area (m^2)                  =   1405.0
     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)  =      168
  Wind direction sector width (deg)    =       90
  Wind direction window (deg)          =   123 - 213
  Distance to intake (m)               =     24.2
  Intake height  (m)                   =     22.5
  Terrain elevation difference (m)     =       .0

  Output file names
    pal01.log
    pal01.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                   =    179
  Hours direction in window               =  13643
  Hours elevated plume w/ dir. in window  =      0
  Hours of calm winds                     =    254
  Hours direction not in window or calm   =  29748

  DISTRIBUTION SUMMARY DATA BY AVERAGING INTERVAL
 AVER. PER.          1          2          4          8         12         24         96        168        360        720
 UPPER LIM.   1.00E-01   1.00E-01   1.00E-01   1.00E-01   1.00E-01   1.00E-01   1.00E-01   1.00E-01   1.00E-01   1.00E-01
   LOW LIM.   1.00E-05   1.00E-05   1.00E-05   1.00E-05   1.00E-05   1.00E-05   1.00E-05   1.00E-05   1.00E-05   1.00E-05
ABOVE RANGE         0.         0.         0.         0.         0.         0.         0.         0.         0.         0.
   IN RANGE     13897.     15678.     18376.     22497.     25742.     32272.     42728.     43188.     43075.     42462.
BELOW RANGE         0.         0.         0.         0.         0.         0.         0.         0.         0.         0.
       ZERO     29748.     27950.     25220.     21035.     17859.     11309.       696.        55.         0.         0.
 TOTAL X/Qs     43645.     43628.     43596.     43532.     43601.     43581.     43424.     43243.     43075.     42462.
 % NON ZERO      31.84      35.94      42.15      51.68      59.04      74.05      98.40      99.87     100.00     100.00

  95th PERCENTILE X/Q VALUES
             1.14E-02   1.11E-02   1.05E-02   9.60E-03   7.69E-03   5.38E-03   3.31E-03   2.84E-03   2.41E-03   2.23E-03

  95% X/Q for standard averaging intervals

  0 to 2 hours        1.14E-02
```

```
    2 to 8 hours        9.00E-03
    8 to 24 hours       3.27E-03
    1 to 4 days         2.61E-03
    4 to 30 days        2.07E-03

                            HOURLY VALUE RANGE
                          MAX X/Q               MIN X/Q
        CENTERLINE        1.31E-02              9.87E-04
        SECTOR-AVERAGE    7.62E-03              5.75E-04

NORMAL PROGRAM COMPLETION
```

pal02.log

```
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.

NRC Contacts:   J. Y. Lee       Phone: (301) 415 1080
                                e-mail: jyl1@nrc.gov
                J. J. Hayes     Phone: (301) 415 3167
                                e-mail: jjh@nrc.gov
                L. A  Brown     Phone: (301) 415 1232
                                e-mail: lab2@nrc.gov

Code Developer: J. V. Ramsdell  Phone: (509) 372 6316
                                e-mail: j_ramsdell@pnl.gov

Code Documentation:  NUREG/CR-6331 Rev. 1

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Program Run   6/24/2004  at  11:47:40

 ******* ARCON INPUT **********
```

```
 Number of Meteorological Data Files  =  1
 Meteorological Data File Names
   C:\ARCON96\PAL\PAL9903.MET

 Height of lower wind instrument (m)  =     10.1
 Height of upper wind instrument (m)  =     57.8
 Wind speeds entered as meters/second

 Ground-level release
 Release height (m)                   =     22.5
 Building Area (m^2)                  =   1405.0
 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)  =      174
 Wind direction sector width (deg)    =       90
 Wind direction window (deg)          =   129 - 219
 Distance to intake (m)               =     21.5
 Intake height  (m)                   =     22.5
 Terrain elevation difference (m)     =       .0

 Output file names
   pal02.log
   pal02.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                   =    179
 Hours direction in window               =  13310
 Hours elevated plume w/ dir. in window  =      0
 Hours of calm winds                     =    254
 Hours direction not in window or calm   =  30081

 DISTRIBUTION SUMMARY DATA BY AVERAGING INTERVAL
AVER. PER.          1          2          4          8         12         24         96        168        360        720
UPPER LIM.   1.00E-01   1.00E-01   1.00E-01   1.00E-01   1.00E-01   1.00E-01   1.00E-01   1.00E-01   1.00E-01   1.00E-01
  LOW LIM.   1.00E-05   1.00E-05   1.00E-05   1.00E-05   1.00E-05   1.00E-05   1.00E-05   1.00E-05   1.00E-05   1.00E-05
```

ABOVE RANGE	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
IN RANGE	13564.	15379.	18144.	22249.	25474.	32024.	42645.	43181.	43075.	42462.
BELOW RANGE	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
ZERO	30081.	28249.	25452.	21283.	18127.	11557.	779.	62.	0.	0.
TOTAL X/Qs	43645.	43628.	43596.	43532.	43601.	43581.	43424.	43243.	43075.	42462.
% NON ZERO	31.08	35.25	41.62	51.11	58.43	73.48	98.21	99.86	100.00	100.00

95th PERCENTILE X/Q VALUES

1.43E-02 1.38E-02 1.30E-02 1.19E-02 9.62E-03 6.72E-03 4.10E-03 3.49E-03 2.95E-03 2.70E-03

95% X/Q for standard averaging intervals

0 to 2 hours	1.43E-02
2 to 8 hours	1.11E-02
8 to 24 hours	4.13E-03
1 to 4 days	3.23E-03
4 to 30 days	2.49E-03

	HOURLY VALUE RANGE	
	MAX X/Q	MIN X/Q
CENTERLINE	1.65E-02	1.23E-03
SECTOR-AVERAGE	9.61E-03	7.19E-04

NORMAL PROGRAM COMPLETION

pal03.log

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.

NRC Contacts: J. Y. Lee Phone: (301) 415 1080
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Code Developer: J. V. Ramsdell Phone: (509) 372 6316
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```
Code Documentation:  NUREG/CR-6331 Rev. 1

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Program Run   6/24/2004  at  11:48:13

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

    Number of Meteorological Data Files  =  1
    Meteorological Data File Names
      C:\ARCON96\PAL\PAL9903.MET

    Height of lower wind instrument (m)  =     10.1
    Height of upper wind instrument (m)  =     57.8
    Wind speeds entered as meters/second

    Ground-level release
    Release height (m)                   =     14.9
    Building Area (m^2)                  =   1405.0
    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)  =      202
    Wind direction sector width (deg)    =       90
    Wind direction window (deg)          =   157 - 247
    Distance to intake (m)               =     95.1
    Intake height  (m)                   =     14.9
    Terrain elevation difference (m)     =       .0

    Output file names
      pal03.log
      pal03.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                   =    179
    Hours direction in window               =  12288
    Hours elevated plume w/ dir. in window  =      0
    Hours of calm winds                     =    254
    Hours direction not in window or calm   =  31103

    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      12542.    14403.    17108.    20950.    23934.    30368.    42047.    43025.    43075.    42462.
BELOW RANGE          0.        0.        0.        0.        0.        0.        0.        0.        0.        0.
       ZERO      31103.    29225.    26488.    22582.    19667.    13213.     1377.      218.        0.        0.
 TOTAL X/Qs      43645.    43628.    43596.    43532.    43601.    43581.    43424.    43243.    43075.    42462.
 % NON ZERO       28.74     33.01     39.24     48.13     54.89     69.68     96.83     99.50    100.00    100.00

    95th PERCENTILE X/Q VALUES
             7.26E-04  7.10E-04  6.84E-04  6.45E-04  5.25E-04  3.80E-04  2.27E-04  1.93E-04  1.60E-04  1.43E-04

    95% X/Q for standard averaging intervals

    0 to 2 hours        7.26E-04
    2 to 8 hours        6.18E-04
    8 to 24 hours       2.47E-04
    1 to 4 days         1.77E-04
    4 to 30 days        1.30E-04

                            HOURLY VALUE RANGE
                          MAX X/Q              MIN X/Q
        CENTERLINE        9.29E-04             1.11E-04
        SECTOR-AVERAGE    5.42E-04             6.47E-05

NORMAL PROGRAM COMPLETION
```

pal04.log

```
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.

NRC Contacts:   J. Y. Lee       Phone: (301) 415 1080
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                J. J. Hayes     Phone: (301) 415 3167
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                L. A  Brown     Phone: (301) 415 1232
                                e-mail: lab2@nrc.gov

Code Developer: J. V. Ramsdell  Phone: (509) 372 6316
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Code Documentation:  NUREG/CR-6331 Rev. 1

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Program Run   6/24/2004  at  11:52:19

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

    Number of Meteorological Data Files  =  1
    Meteorological Data File Names
      C:\ARCON96\PAL\PAL9903.MET

    Height of lower wind instrument (m)  =     10.1
    Height of upper wind instrument (m)  =     57.8
    Wind speeds entered as meters/second

    Ground-level release
    Release height (m)                   =     24.5
    Building Area (m^2)                  =   1405.0
    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)  =      157
    Wind direction sector width (deg)    =       90
    Wind direction window (deg)          =   112 - 202
    Distance to intake (m)               =     10.6
    Intake height  (m)                   =     22.5
```

```
  Terrain elevation difference (m)     =       .0

  Output file names
    pal04.log
    pal04.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                   =    179
  Hours direction in window               =  14146
  Hours elevated plume w/ dir. in window  =      0
  Hours of calm winds                     =    254
  Hours direction not in window or calm   =  29245

  DISTRIBUTION SUMMARY DATA BY AVERAGING INTERVAL
 AVER. PER.          1          2          4          8         12         24         96        168        360        720
 UPPER LIM.   1.00E-01   1.00E-01   1.00E-01   1.00E-01   1.00E-01   1.00E-01   1.00E-01   1.00E-01   1.00E-01   1.00E-01
   LOW LIM.   1.00E-05   1.00E-05   1.00E-05   1.00E-05   1.00E-05   1.00E-05   1.00E-05   1.00E-05   1.00E-05   1.00E-05
ABOVE RANGE         0.         0.         0.         0.         0.         0.         0.         0.         0.         0.
   IN RANGE     14400.     16213.     18971.     23202.     26558.     33195.     42938.     43231.     43075.     42462.
BELOW RANGE         0.         0.         0.         0.         0.         0.        54.         0.         0.         0.
      ZERO      29245.     27415.     24625.     20330.     17043.     10386.       432.        12.         0.         0.
 TOTAL X/Qs     43645.     43628.     43596.     43532.     43601.     43581.     43424.     43243.     43075.     42462.
 % NON ZERO      32.99      37.16      43.52      53.30      60.91      76.17      99.01      99.97     100.00     100.00

  95th PERCENTILE X/Q VALUES
             5.55E-02   5.44E-02   5.13E-02   4.65E-02   3.72E-02   2.58E-02   1.58E-02   1.36E-02   1.17E-02   1.08E-02

  95% X/Q for standard averaging intervals

  0 to 2 hours        5.55E-02
  2 to 8 hours        4.35E-02
  8 to 24 hours       1.54E-02
  1 to 4 days         1.25E-02
  4 to 30 days        1.01E-02

                          HOURLY VALUE RANGE
                        MAX X/Q              MIN X/Q
     CENTERLINE         6.42E-02             4.45E-03
```

```
         SECTOR-AVERAGE     3.74E-02              2.59E-03

NORMAL PROGRAM COMPLETION
```

pal05.log

```
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.

NRC Contacts:   J. Y. Lee       Phone: (301) 415 1080
                                e-mail: jyl1@nrc.gov
                J. J. Hayes     Phone: (301) 415 3167
                                e-mail: jjh@nrc.gov
                L. A  Brown     Phone: (301) 415 1232
                                e-mail: lab2@nrc.gov

Code Developer: J. V. Ramsdell  Phone: (509) 372 6316
                                e-mail: j_ramsdell@pnl.gov

Code Documentation:  NUREG/CR-6331 Rev. 1

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party would not infringe privately owned rights.

Program Run   6/24/2004  at  11:52:47

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

    Number of Meteorological Data Files  =  1
    Meteorological Data File Names
      C:\ARCON96\PAL\PAL9903.MET

    Height of lower wind instrument (m)  =     10.1
    Height of upper wind instrument (m)  =     57.8
    Wind speeds entered as meters/second
```

```
  Ground-level release
  Release height (m)                    =     24.5
  Building Area (m^2)                   =   1405.0
  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)   =      184
  Wind direction sector width (deg)     =       90
  Wind direction window (deg)           =   139 - 229
  Distance to intake (m)                =      7.7
  Intake height  (m)                    =     22.5
  Terrain elevation difference (m)      =       .0

  Output file names
    pal05.log
    pal05.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                   =    179
  Hours direction in window               =  13357
  Hours elevated plume w/ dir. in window  =      0
  Hours of calm winds                     =    254
  Hours direction not in window or calm   =  30034

  DISTRIBUTION SUMMARY DATA BY AVERAGING INTERVAL
 AVER. PER.          1         2         4         8        12        24        96       168       360       720
 UPPER LIM.   1.00E+00  1.00E+00  1.00E+00  1.00E+00  1.00E-01  1.00E-01  1.00E-01  1.00E-01  1.00E-01  1.00E-01
   LOW LIM.   1.00E-04  1.00E-04  1.00E-04  1.00E-04  1.00E-05  1.00E-05  1.00E-05  1.00E-05  1.00E-05  1.00E-05
ABOVE RANGE         0.        0.        0.        0.        0.        0.        0.        0.        0.        0.
   IN RANGE     13611.    15443.    18200.    22241.    25317.    31738.    42313.    42980.    43075.    42462.
BELOW RANGE         0.        0.        0.        0.        0.        0.        0.        0.        0.        0.
       ZERO     30034.    28185.    25396.    21291.    18284.    11843.     1111.      263.        0.        0.
 TOTAL X/Qs     43645.    43628.    43596.    43532.    43601.    43581.    43424.    43243.    43075.    42462.
 % NON ZERO      31.19     35.40     41.75     51.09     58.07     72.83     97.44     99.39    100.00    100.00

  95th PERCENTILE X/Q VALUES
```

```
                9.57E-02   9.30E-02   8.82E-02   8.08E-02   6.53E-02   4.61E-02   2.80E-02   2.36E-02   1.99E-02   1.80E-02

    95% X/Q for standard averaging intervals

    0 to 2 hours        9.57E-02
    2 to 8 hours        7.59E-02
    8 to 24 hours       2.87E-02
    1 to 4 days         2.19E-02
    4 to 30 days        1.65E-02

                            HOURLY VALUE RANGE
                          MAX X/Q              MIN X/Q
        CENTERLINE        1.16E-01             7.80E-03
        SECTOR-AVERAGE    6.74E-02             4.55E-03

NORMAL PROGRAM COMPLETION
```

pal06.log

```
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.

NRC Contacts:   J. Y. Lee       Phone: (301) 415 1080
                                e-mail: jyl1@nrc.gov
                J. J. Hayes     Phone: (301) 415 3167
                                e-mail: jjh@nrc.gov
                L. A  Brown     Phone: (301) 415 1232
                                e-mail: lab2@nrc.gov

Code Developer: J. V. Ramsdell  Phone: (509) 372 6316
                                e-mail: j_ramsdell@pnl.gov

Code Documentation:  NUREG/CR-6331 Rev. 1

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liability or responsibilities for any third party's use, or the results of such
use, of any portion of this program or represents that its use by such third
```

```
party would not infringe privately owned rights.

Program Run   6/24/2004  at  11:53:24

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

    Number of Meteorological Data Files  =  1
    Meteorological Data File Names
      C:\ARCON96\PAL\PAL9903.MET

    Height of lower wind instrument (m)  =     10.1
    Height of upper wind instrument (m)  =     57.8
    Wind speeds entered as meters/second

    Ground-level release
    Release height (m)                   =     24.5
    Building Area (m^2)                  =   1405.0
    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)  =      214
    Wind direction sector width (deg)    =       90
    Wind direction window (deg)          =   169 - 259
    Distance to intake (m)               =     81.2
    Intake height  (m)                   =     14.9
    Terrain elevation difference (m)     =       .0

    Output file names
      pal06.log
      pal06.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                   =    179
    Hours direction in window               =  11463
    Hours elevated plume w/ dir. in window  =      0
    Hours of calm winds                     =    254
    Hours direction not in window or calm   =  31928
```

```
   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      11717.     13486.     16120.     20091.     23162.     29573.     41741.     42969.     43075.     42462.
BELOW RANGE          0.         0.         0.         0.         0.         0.         0.         9.         0.         0.
       ZERO      31928.     30142.     27476.     23441.     20439.     14008.      1683.       265.         0.         0.
 TOTAL X/Qs      43645.     43628.     43596.     43532.     43601.     43581.     43424.     43243.     43075.     42462.
 % NON ZERO       26.85      30.91      36.98      46.15      53.12      67.86      96.12      99.39     100.00     100.00

  95th PERCENTILE X/Q VALUES
              9.66E-04   9.42E-04   9.01E-04   8.35E-04   6.77E-04   4.87E-04   2.86E-04   2.39E-04   2.02E-04   1.80E-04

  95% X/Q for standard averaging intervals

  0 to 2 hours        9.66E-04
  2 to 8 hours        7.92E-04
  8 to 24 hours       3.13E-04
  1 to 4 days         2.20E-04
  4 to 30 days        1.64E-04

                           HOURLY VALUE RANGE
                         MAX X/Q              MIN X/Q
       CENTERLINE        1.24E-03             1.34E-04
       SECTOR-AVERAGE    7.22E-04             7.78E-05

NORMAL PROGRAM COMPLETION
```

pal07.log

```
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.

NRC Contacts:   J. Y. Lee       Phone: (301) 415 1080
                                e-mail: jyl1@nrc.gov
                J. J. Hayes     Phone: (301) 415 3167
                                e-mail: jjh@nrc.gov
```

L. A Brown Phone: (301) 415 1232
e-mail: lab2@nrc.gov

Code Developer: J. V. Ramsdell Phone: (509) 372 6316
e-mail: j_ramsdell@pnl.gov

Code Documentation: NUREG/CR-6331 Rev. 1

Program Run 6/24/2004 at 11:54:04

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

Number of Meteorological Data Files = 1
Meteorological Data File Names
C:\ARCON96\PAL\PAL9903.MET

Height of lower wind instrument (m) = 10.1
Height of upper wind instrument (m) = 57.8
Wind speeds entered as meters/second

Ground-level release
Release height (m) = 58.5
Building Area (m^2) = .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) = 169
Wind direction sector width (deg) = 90
Wind direction window (deg) = 124 - 214
Distance to intake (m) = 22.3
Intake height (m) = 22.5
Terrain elevation difference (m) = .0

Output file names
pal07.log
pal07.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                =    179
    Hours direction in window            =  12421
    Hours elevated plume w/ dir. in window  =      0
    Hours of calm winds                  =    324
    Hours direction not in window or calm   =  30900

    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     12745.     14355.     16889.     20834.     24004.     30756.     42445.     43155.     43075.     42462.
 BELOW RANGE         0.         0.         0.         0.         0.         0.         0.         0.         0.         0.
       ZERO      30900.     29273.     26707.     22698.     19597.     12825.       979.        88.         0.         0.
  TOTAL X/Qs     43645.     43628.     43596.     43532.     43601.     43581.     43424.     43243.     43075.     42462.
  % NON ZERO      29.20      32.90      38.74      47.86      55.05      70.57      97.75      99.80     100.00     100.00

    95th PERCENTILE X/Q VALUES
             5.83E-03   5.45E-03   5.04E-03   4.58E-03   3.68E-03   2.56E-03   1.53E-03   1.31E-03   1.09E-03   9.92E-04

    95% X/Q for standard averaging intervals

    0 to 2 hours        5.83E-03
    2 to 8 hours        4.16E-03
    8 to 24 hours       1.55E-03
    1 to 4 days         1.19E-03
    4 to 30 days        9.09E-04

                            HOURLY VALUE RANGE
                          MAX X/Q              MIN X/Q
       CENTERLINE         9.92E-03             3.80E-04
       SECTOR-AVERAGE     5.14E-03             2.21E-04

NORMAL PROGRAM COMPLETION
```

pal08.log

```
 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.

 NRC Contacts:   J. Y. Lee       Phone: (301) 415 1080
                                 e-mail: jyl1@nrc.gov
                 J. J. Hayes     Phone: (301) 415 3167
                                 e-mail: jjh@nrc.gov
                 L. A  Brown     Phone: (301) 415 1232
                                 e-mail: lab2@nrc.gov

 Code Developer: J. V. Ramsdell  Phone: (509) 372 6316
                                 e-mail: j_ramsdell@pnl.gov

 Code Documentation:  NUREG/CR-6331 Rev. 1

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 party would not infringe privately owned rights.

 Program Run   6/24/2004  at  11:54:41

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

    Number of Meteorological Data Files  =  1
    Meteorological Data File Names
      C:\ARCON96\PAL\PAL9903.MET

    Height of lower wind instrument (m)  =     10.1
    Height of upper wind instrument (m)  =     57.8
    Wind speeds entered as meters/second

    Ground-level release
    Release height (m)                   =     58.5
    Building Area (m^2)                  =       .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)  =      181
  Wind direction sector width (deg)    =       90
  Wind direction window (deg)          =   136 - 226
  Distance to intake (m)               =     19.8
  Intake height  (m)                   =     22.5
  Terrain elevation difference (m)     =       .0

  Output file names
    pal08.log
    pal08.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                   =    179
  Hours direction in window               =  13235
  Hours elevated plume w/ dir. in window  =      0
  Hours of calm winds                     =    324
  Hours direction not in window or calm   =  30086

  DISTRIBUTION SUMMARY DATA BY AVERAGING INTERVAL
 AVER. PER.          1          2          4          8         12         24         96        168        360        720
 UPPER LIM.   1.00E-01   1.00E-01   1.00E-01   1.00E-01   1.00E-02   1.00E-02   1.00E-02   1.00E-02   1.00E-02   1.00E-02
   LOW LIM.   1.00E-05   1.00E-05   1.00E-05   1.00E-05   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     13559.     15173.     17724.     21545.     24562.     31097.     42269.     43003.     43075.     42462.
BELOW RANGE         0.         0.         0.         0.         0.         0.         0.         0.         0.         0.
       ZERO     30086.     28455.     25872.     21987.     19039.     12484.      1155.       240.         0.         0.
 TOTAL X/Qs     43645.     43628.     43596.     43532.     43601.     43581.     43424.     43243.     43075.     42462.
 % NON ZERO      31.07      34.78      40.66      49.49      56.33      71.35      97.34      99.44     100.00     100.00

  95th PERCENTILE X/Q VALUES
             6.10E-03   5.63E-03   5.28E-03   4.76E-03   3.89E-03   2.74E-03   1.64E-03   1.41E-03   1.18E-03   1.07E-03

  95% X/Q for standard averaging intervals

  0 to 2 hours        6.10E-03
```

```
    2 to 8 hours        4.32E-03
    8 to 24 hours       1.73E-03
    1 to 4 days         1.27E-03
    4 to 30 days        9.79E-04

                            HOURLY VALUE RANGE
                          MAX X/Q               MIN X/Q
        CENTERLINE        1.05E-02              3.43E-04
        SECTOR-AVERAGE    5.44E-03              2.00E-04

NORMAL PROGRAM COMPLETION
```

pal09.log

```
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.

NRC Contacts:   J. Y. Lee       Phone: (301) 415 1080
                                e-mail: jyl1@nrc.gov
                J. J. Hayes     Phone: (301) 415 3167
                                e-mail: jjh@nrc.gov
                L. A  Brown     Phone: (301) 415 1232
                                e-mail: lab2@nrc.gov

Code Developer: J. V. Ramsdell  Phone: (509) 372 6316
                                e-mail: j_ramsdell@pnl.gov

Code Documentation:  NUREG/CR-6331 Rev. 1

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liability or responsibilities for any third party's use, or the results of such
use, of any portion of this program or represents that its use by such third
party would not infringe privately owned rights.

Program Run   6/24/2004  at  11:55:13

 ******* ARCON INPUT **********
```

```
 Number of Meteorological Data Files  =  1
 Meteorological Data File Names
   C:\ARCON96\PAL\PAL9903.MET

 Height of lower wind instrument (m)  =     10.1
 Height of upper wind instrument (m)  =     57.8
 Wind speeds entered as meters/second

 Ground-level release
 Release height (m)                   =     58.5
 Building Area (m^2)                  =       .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)  =      209
 Wind direction sector width (deg)    =       90
 Wind direction window (deg)          =   164 - 254
 Distance to intake (m)               =     97.4
 Intake height  (m)                   =     14.9
 Terrain elevation difference (m)     =       .0

 Output file names
   pal09.log
   pal09.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                   =    179
 Hours direction in window               =  13898
 Hours elevated plume w/ dir. in window  =      0
 Hours of calm winds                     =    324
 Hours direction not in window or calm   =  29423

 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	14222.	15772.	18159.	21755.	24611.	30689.	41887.	42918.	43075.	42462.
BELOW RANGE	0.	0.	0.	0.	0.	0.	55.	62.	0.	0.
ZERO	29423.	27856.	25437.	21777.	18990.	12892.	1482.	263.	0.	0.
TOTAL X/Qs	43645.	43628.	43596.	43532.	43601.	43581.	43424.	43243.	43075.	42462.
% NON ZERO	32.59	36.15	41.65	49.97	56.45	70.42	96.59	99.39	100.00	100.00

95th PERCENTILE X/Q VALUES

8.32E-04	8.32E-04	8.26E-04	7.85E-04	6.31E-04	4.50E-04	2.74E-04	2.32E-04	1.93E-04	1.73E-04

95% X/Q for standard averaging intervals

0 to 2 hours	8.32E-04
2 to 8 hours	7.69E-04
8 to 24 hours	2.83E-04
1 to 4 days	2.15E-04
4 to 30 days	1.57E-04

	HOURLY VALUE RANGE	
	MAX X/Q	MIN X/Q
CENTERLINE	1.66E-03	5.99E-05
SECTOR-AVERAGE	8.72E-04	3.49E-05

NORMAL PROGRAM COMPLETION

pal10.log

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.

NRC Contacts: J. Y. Lee Phone: (301) 415 1080
e-mail: jyl1@nrc.gov
J. J. Hayes Phone: (301) 415 3167
e-mail: jjh@nrc.gov
L. A Brown Phone: (301) 415 1232
e-mail: lab2@nrc.gov

Code Developer: J. V. Ramsdell Phone: (509) 372 6316
e-mail: j_ramsdell@pnl.gov

```
Code Documentation:  NUREG/CR-6331 Rev. 1

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employees, makes any warranty, expressed or implied, or assumes any legal
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use, of any portion of this program or represents that its use by such third
party would not infringe privately owned rights.

Program Run   6/29/2004  at  12:23:40

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

    Number of Meteorological Data Files  =  1
    Meteorological Data File Names
      C:\ARCON96\PAL\PAL9903.MET

    Height of lower wind instrument (m)  =     10.1
    Height of upper wind instrument (m)  =     57.8
    Wind speeds entered as meters/second

    Ground-level release
    Release height (m)                   =     17.4
    Building Area (m^2)                  =       .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)  =      192
    Wind direction sector width (deg)    =       90
    Wind direction window (deg)          =   147 - 237
    Distance to intake (m)               =     20.1
    Intake height  (m)                   =     22.5
    Terrain elevation difference (m)     =       .0

    Output file names
      pal10.log
      pal10.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                   =    179
    Hours direction in window               =  13519
    Hours elevated plume w/ dir. in window  =      0
    Hours of calm winds                     =    254
    Hours direction not in window or calm   =  29872

    DISTRIBUTION SUMMARY DATA BY AVERAGING INTERVAL
  AVER. PER.          1         2         4         8        12        24        96       168       360       720
  UPPER LIM.   1.00E-01  1.00E-01  1.00E-01  1.00E-01  1.00E-01  1.00E-01  1.00E-01  1.00E-01  1.00E-01  1.00E-01
    LOW LIM.   1.00E-05  1.00E-05  1.00E-05  1.00E-05  1.00E-05  1.00E-05  1.00E-05  1.00E-05  1.00E-05  1.00E-05
ABOVE RANGE          0.        0.        0.        0.        0.        0.        0.        0.        0.        0.
   IN RANGE      13773.    15655.    18278.    22066.    24993.    31279.    42164.    42955.    43075.    42462.
BELOW RANGE          0.        0.        0.        0.        0.        0.        0.        0.        0.        0.
       ZERO      29872.    27973.    25318.    21466.    18608.    12302.     1260.      288.        0.        0.
 TOTAL X/Qs      43645.    43628.    43596.    43532.    43601.    43581.    43424.    43243.    43075.    42462.
 % NON ZERO       31.56     35.88     41.93     50.69     57.32     71.77     97.10     99.33    100.00    100.00

    95th PERCENTILE X/Q VALUES
              1.65E-02  1.60E-02  1.52E-02  1.41E-02  1.16E-02  8.31E-03  5.10E-03  4.28E-03  3.66E-03  3.26E-03

    95% X/Q for standard averaging intervals

    0 to 2 hours        1.65E-02
    2 to 8 hours        1.34E-02
    8 to 24 hours       5.40E-03
    1 to 4 days         4.03E-03
    4 to 30 days        2.98E-03

                           HOURLY VALUE RANGE
                         MAX X/Q              MIN X/Q
       CENTERLINE        2.90E-02             1.72E-03
       SECTOR-AVERAGE    1.69E-02             1.00E-03

NORMAL PROGRAM COMPLETION
```

pal11.log

```
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.

NRC Contacts:   J. Y. Lee       Phone: (301) 415 1080
                                e-mail: jyl1@nrc.gov
                J. J. Hayes     Phone: (301) 415 3167
                                e-mail: jjh@nrc.gov
                L. A  Brown     Phone: (301) 415 1232
                                e-mail: lab2@nrc.gov

Code Developer: J. V. Ramsdell  Phone: (509) 372 6316
                                e-mail: j_ramsdell@pnl.gov

Code Documentation:  NUREG/CR-6331 Rev. 1

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use, of any portion of this program or represents that its use by such third
party would not infringe privately owned rights.

Program Run   6/29/2004  at  12:24:35

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

    Number of Meteorological Data Files  =  1
    Meteorological Data File Names
      C:\ARCON96\PAL\PAL9903.MET

    Height of lower wind instrument (m)  =     10.1
    Height of upper wind instrument (m)  =     57.8
    Wind speeds entered as meters/second

    Ground-level release
    Release height (m)                   =     17.4
    Building Area (m^2)                  =       .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)  =      207
    Wind direction sector width (deg)    =       90
    Wind direction window (deg)          =   162 - 252
    Distance to intake (m)               =     19.8
    Intake height  (m)                   =     22.5
```

```
  Terrain elevation difference (m)     =       .0

  Output file names
    pal11.log
    pal11.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                   =    179
  Hours direction in window               =  11857
  Hours elevated plume w/ dir. in window  =      0
  Hours of calm winds                     =    254
  Hours direction not in window or calm   =  31534

  DISTRIBUTION SUMMARY DATA BY AVERAGING INTERVAL
 AVER. PER.          1          2          4          8         12         24         96        168        360        720
 UPPER LIM.   1.00E-01   1.00E-01   1.00E-01   1.00E-01   1.00E-01   1.00E-01   1.00E-01   1.00E-01   1.00E-01   1.00E-01
   LOW LIM.   1.00E-05   1.00E-05   1.00E-05   1.00E-05   1.00E-05   1.00E-05   1.00E-05   1.00E-05   1.00E-05   1.00E-05
ABOVE RANGE         0.         0.         0.         0.         0.         0.         0.         0.         0.         0.
   IN RANGE     12111.     13923.     16558.     20431.     23495.     29974.     41999.     43046.     43075.     42462.
BELOW RANGE         0.         0.         0.         0.         0.         0.         0.         0.         0.         0.
      ZERO      31534.     29705.     27038.     23101.     20106.     13607.      1425.       197.         0.         0.
 TOTAL X/Qs     43645.     43628.     43596.     43532.     43601.     43581.     43424.     43243.     43075.     42462.
 % NON ZERO      27.75      31.91      37.98      46.93      53.89      68.78      96.72      99.54     100.00     100.00

  95th PERCENTILE X/Q VALUES
             1.58E-02   1.52E-02   1.45E-02   1.37E-02   1.12E-02   7.99E-03   4.74E-03   3.97E-03   3.32E-03   2.98E-03

  95% X/Q for standard averaging intervals

  0 to 2 hours        1.58E-02
  2 to 8 hours        1.30E-02
  8 to 24 hours       5.12E-03
  1 to 4 days         3.65E-03
  4 to 30 days        2.71E-03

                          HOURLY VALUE RANGE
                        MAX X/Q              MIN X/Q
     CENTERLINE         2.98E-02             2.23E-03
```

```
         SECTOR-AVERAGE     1.74E-02              1.30E-03

NORMAL PROGRAM COMPLETION
```

pal12.log

```
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.

NRC Contacts:   J. Y. Lee       Phone: (301) 415 1080
                                e-mail: jyl1@nrc.gov
                J. J. Hayes     Phone: (301) 415 3167
                                e-mail: jjh@nrc.gov
                L. A  Brown     Phone: (301) 415 1232
                                e-mail: lab2@nrc.gov

Code Developer: J. V. Ramsdell  Phone: (509) 372 6316
                                e-mail: j_ramsdell@pnl.gov

Code Documentation:  NUREG/CR-6331 Rev. 1

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use, of any portion of this program or represents that its use by such third
party would not infringe privately owned rights.

Program Run   6/29/2004  at  12:25:26

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

    Number of Meteorological Data Files  =  1
    Meteorological Data File Names
      C:\ARCON96\PAL\PAL9903.MET

    Height of lower wind instrument (m)  =     10.1
    Height of upper wind instrument (m)  =     57.8
    Wind speeds entered as meters/second
```

```
 Ground-level release
 Release height (m)                    =     17.4
 Building Area (m^2)                   =       .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)   =      214
 Wind direction sector width (deg)     =       90
 Wind direction window (deg)           =   169 - 259
 Distance to intake (m)                =    100.4
 Intake height  (m)                    =     14.9
 Terrain elevation difference (m)      =       .0

 Output file names
   pal12.log
   pal12.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                   =    179
 Hours direction in window               =  11463
 Hours elevated plume w/ dir. in window  =      0
 Hours of calm winds                     =    254
 Hours direction not in window or calm   =  31928

 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-03  1.00E-03  1.00E-03  1.00E-03  1.00E-03  1.00E-03
   LOW LIM.   1.00E-06  1.00E-06  1.00E-06  1.00E-06  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     11717.    13486.    16120.    20091.    23162.    29573.    41741.    42978.    43075.    42462.
BELOW RANGE         0.        0.        0.        0.        0.        0.        0.        0.        0.        0.
       ZERO     31928.    30142.    27476.    23441.    20439.    14008.     1683.      265.        0.        0.
 TOTAL X/Qs     43645.    43628.    43596.    43532.    43601.    43581.    43424.    43243.    43075.    42462.
 % NON ZERO      26.85     30.91     36.98     46.15     53.12     67.86     96.12     99.39    100.00    100.00

 95th PERCENTILE X/Q VALUES
```

```
                7.36E-04   7.21E-04   6.96E-04   6.66E-04   5.42E-04   3.84E-04   2.27E-04   1.88E-04   1.62E-04   1.41E-04

    95% X/Q for standard averaging intervals

    0 to 2 hours        7.36E-04
    2 to 8 hours        6.42E-04
    8 to 24 hours       2.43E-04
    1 to 4 days         1.75E-04
    4 to 30 days        1.28E-04

                            HOURLY VALUE RANGE
                          MAX X/Q              MIN X/Q
         CENTERLINE        1.39E-03             1.20E-04
         SECTOR-AVERAGE    8.12E-04             7.02E-05

NORMAL PROGRAM COMPLETION
```

pal13.log

```
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.

NRC Contacts:   J. Y. Lee       Phone: (301) 415 1080
                                e-mail: jyl1@nrc.gov
                J. J. Hayes     Phone: (301) 415 3167
                                e-mail: jjh@nrc.gov
                L. A  Brown     Phone: (301) 415 1232
                                e-mail: lab2@nrc.gov

Code Developer: J. V. Ramsdell  Phone: (509) 372 6316
                                e-mail: j_ramsdell@pnl.gov

Code Documentation:  NUREG/CR-6331 Rev. 1

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```

```
party would not infringe privately owned rights.

Program Run   6/29/2004  at  12:26:05

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

    Number of Meteorological Data Files  =  1
    Meteorological Data File Names
      C:\ARCON96\PAL\PAL9903.MET

    Height of lower wind instrument (m)  =     10.1
    Height of upper wind instrument (m)  =     57.8
    Wind speeds entered as meters/second

    Ground-level release
    Release height (m)                   =     17.4
    Building Area (m^2)                  =       .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)  =      187
    Wind direction sector width (deg)    =       90
    Wind direction window (deg)          =   142 - 232
    Distance to intake (m)               =     17.6
    Intake height  (m)                   =     22.5
    Terrain elevation difference (m)     =       .0

    Output file names
      pal13.log
      pal13.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                   =    179
    Hours direction in window               =  13410
    Hours elevated plume w/ dir. in window  =      0
    Hours of calm winds                     =    254
    Hours direction not in window or calm   =  29981
```

```
   DISTRIBUTION SUMMARY DATA BY AVERAGING INTERVAL
  AVER. PER.          1          2          4          8         12         24         96        168        360        720
  UPPER LIM.   1.00E-01   1.00E-01   1.00E-01   1.00E-01   1.00E-01   1.00E-01   1.00E-01   1.00E-01   1.00E-01   1.00E-01
    LOW LIM.   1.00E-05   1.00E-05   1.00E-05   1.00E-05   1.00E-05   1.00E-05   1.00E-05   1.00E-05   1.00E-05   1.00E-05
ABOVE RANGE          0.         0.         0.         0.         0.         0.         0.         0.         0.         0.
   IN RANGE      13664.     15489.     18200.     22162.     25169.     31549.     42237.     42980.     43075.     42462.
BELOW RANGE          0.         0.         0.         0.         0.         0.         0.         0.         0.         0.
       ZERO      29981.     28139.     25396.     21370.     18432.     12032.      1187.       263.         0.         0.
 TOTAL X/Qs      43645.     43628.     43596.     43532.     43601.     43581.     43424.     43243.     43075.     42462.
 % NON ZERO       31.31      35.50      41.75      50.91      57.73      72.39      97.27      99.39     100.00     100.00

  95th PERCENTILE X/Q VALUES
              2.10E-02   2.04E-02   1.95E-02   1.80E-02   1.46E-02   1.05E-02   6.37E-03   5.37E-03   4.59E-03   4.08E-03

  95% X/Q for standard averaging intervals

  0 to 2 hours        2.10E-02
  2 to 8 hours        1.70E-02
  8 to 24 hours       6.80E-03
  1 to 4 days         4.98E-03
  4 to 30 days        3.72E-03

                           HOURLY VALUE RANGE
                         MAX X/Q              MIN X/Q
       CENTERLINE        3.66E-02             2.15E-03
       SECTOR-AVERAGE    2.13E-02             1.25E-03

NORMAL PROGRAM COMPLETION
```

pal14.log

```
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.

NRC Contacts:   J. Y. Lee       Phone: (301) 415 1080
                                e-mail: jyl1@nrc.gov
                J. J. Hayes     Phone: (301) 415 3167
                                e-mail: jjh@nrc.gov
```

L. A Brown Phone: (301) 415 1232
e-mail: lab2@nrc.gov

Code Developer: J. V. Ramsdell Phone: (509) 372 6316
e-mail: j_ramsdell@pnl.gov

Code Documentation: NUREG/CR-6331 Rev. 1

Program Run 6/29/2004 at 12:27:31

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

Number of Meteorological Data Files = 1
Meteorological Data File Names
C:\ARCON96\PAL\PAL9903.MET

Height of lower wind instrument (m) = 10.1
Height of upper wind instrument (m) = 57.8
Wind speeds entered as meters/second

Ground-level release
Release height (m) = 17.4
Building Area (m^2) = .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) = 204
Wind direction sector width (deg) = 90
Wind direction window (deg) = 159 - 249
Distance to intake (m) = 17.0
Intake height (m) = 22.5
Terrain elevation difference (m) = .0

Output file names
pal14.log
pal14.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                =    179
    Hours direction in window            =  12090
    Hours elevated plume w/ dir. in window  =      0
    Hours of calm winds                  =    254
    Hours direction not in window or calm   =  31301

    DISTRIBUTION SUMMARY DATA BY AVERAGING INTERVAL
  AVER. PER.          1          2          4          8         12         24         96        168        360        720
  UPPER LIM.   1.00E-01   1.00E-01   1.00E-01   1.00E-01   1.00E-01   1.00E-01   1.00E-01   1.00E-01   1.00E-01   1.00E-01
    LOW LIM.   1.00E-05   1.00E-05   1.00E-05   1.00E-05   1.00E-05   1.00E-05   1.00E-05   1.00E-05   1.00E-05   1.00E-05
 ABOVE RANGE         0.         0.         0.         0.         0.         0.         0.         0.         0.         0.
    IN RANGE     12344.     14165.     16811.     20687.     23730.     30246.     42115.     43046.     43075.     42462.
 BELOW RANGE         0.         0.         0.         0.         0.         0.         0.         0.         0.         0.
       ZERO      31301.     29463.     26785.     22845.     19871.     13335.      1309.       197.         0.         0.
  TOTAL X/Qs     43645.     43628.     43596.     43532.     43601.     43581.     43424.     43243.     43075.     42462.
  % NON ZERO      28.28      32.47      38.56      47.52      54.43      69.40      96.99      99.54     100.00     100.00

    95th PERCENTILE X/Q VALUES
             2.11E-02   2.02E-02   1.92E-02   1.81E-02   1.48E-02   1.06E-02   6.34E-03   5.36E-03   4.49E-03   4.01E-03

    95% X/Q for standard averaging intervals

    0 to 2 hours        2.11E-02
    2 to 8 hours        1.71E-02
    8 to 24 hours       6.91E-03
    1 to 4 days         4.90E-03
    4 to 30 days        3.65E-03

                            HOURLY VALUE RANGE
                          MAX X/Q              MIN X/Q
        CENTERLINE        3.92E-02             2.90E-03
        SECTOR-AVERAGE    2.29E-02             1.69E-03

NORMAL PROGRAM COMPLETION
```

pal15.log

```
 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.

 NRC Contacts:   J. Y. Lee       Phone: (301) 415 1080
                                 e-mail: jyl1@nrc.gov
                 J. J. Hayes     Phone: (301) 415 3167
                                 e-mail: jjh@nrc.gov
                 L. A  Brown     Phone: (301) 415 1232
                                 e-mail: lab2@nrc.gov

 Code Developer: J. V. Ramsdell  Phone: (509) 372 6316
                                 e-mail: j_ramsdell@pnl.gov

 Code Documentation:  NUREG/CR-6331 Rev. 1

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 party would not infringe privately owned rights.

 Program Run   6/29/2004  at  12:28:08

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

     Number of Meteorological Data Files  =  1
     Meteorological Data File Names
       C:\ARCON96\PAL\PAL9903.MET

     Height of lower wind instrument (m)  =     10.1
     Height of upper wind instrument (m)  =     57.8
     Wind speeds entered as meters/second

     Ground-level release
     Release height (m)                   =     17.4
     Building Area (m^2)                  =       .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)  =      213
  Wind direction sector width (deg)    =       90
  Wind direction window (deg)          =   168 - 258
  Distance to intake (m)               =     96.8
  Intake height  (m)                   =     14.9
  Terrain elevation difference (m)     =       .0

  Output file names
    pal15.log
    pal15.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                   =    179
  Hours direction in window               =  11515
  Hours elevated plume w/ dir. in window  =      0
  Hours of calm winds                     =    254
  Hours direction not in window or calm   =  31876

  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     11769.     13542.     16168.     20090.     23163.     29569.     41733.     42877.     43075.     42462.
BELOW RANGE         0.         0.         0.         0.         0.         0.         0.       101.         0.         0.
       ZERO     31876.     30086.     27428.     23442.     20438.     14012.      1691.       265.         0.         0.
 TOTAL X/Qs     43645.     43628.     43596.     43532.     43601.     43581.     43424.     43243.     43075.     42462.
 % NON ZERO      26.97      31.04      37.09      46.15      53.12      67.85      96.11      99.39     100.00     100.00

  95th PERCENTILE X/Q VALUES
             7.96E-04   7.76E-04   7.52E-04   7.17E-04   5.83E-04   4.12E-04   2.45E-04   2.04E-04   1.74E-04   1.51E-04

  95% X/Q for standard averaging intervals

  0 to 2 hours        7.96E-04
```

```
    2 to 8 hours        6.91E-04
    8 to 24 hours       2.60E-04
    1 to 4 days         1.90E-04
    4 to 30 days        1.37E-04

                            HOURLY VALUE RANGE
                          MAX X/Q               MIN X/Q
        CENTERLINE        1.49E-03              1.29E-04
        SECTOR-AVERAGE    8.71E-04              7.50E-05

NORMAL PROGRAM COMPLETION
```

pal16.log

```
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.

NRC Contacts:   J. Y. Lee       Phone: (301) 415 1080
                                e-mail: jyl1@nrc.gov
                J. J. Hayes     Phone: (301) 415 3167
                                e-mail: jjh@nrc.gov
                L. A  Brown     Phone: (301) 415 1232
                                e-mail: lab2@nrc.gov

Code Developer: J. V. Ramsdell  Phone: (509) 372 6316
                                e-mail: j_ramsdell@pnl.gov

Code Documentation:  NUREG/CR-6331 Rev. 1

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use, of any portion of this program or represents that its use by such third
party would not infringe privately owned rights.

Program Run   6/28/2004  at  18:13:22

 ******* ARCON INPUT **********
```

```
 Number of Meteorological Data Files  =  1
 Meteorological Data File Names
   C:\ARCON96\PAL\PAL9903.MET

 Height of lower wind instrument (m)  =     10.1
 Height of upper wind instrument (m)  =     57.8
 Wind speeds entered as meters/second

 Ground-level release
 Release height (m)                   =     20.4
 Building Area (m^2)                  =   1405.0
 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)  =      152
 Wind direction sector width (deg)    =       90
 Wind direction window (deg)          =   107 - 197
 Distance to intake (m)               =     26.8
 Intake height  (m)                   =     22.5
 Terrain elevation difference (m)     =       .0

 Output file names
   pal16.log
   pal16.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                   =    179
 Hours direction in window               =  14287
 Hours elevated plume w/ dir. in window  =      0
 Hours of calm winds                     =    254
 Hours direction not in window or calm   =  29104

 DISTRIBUTION SUMMARY DATA BY AVERAGING INTERVAL
AVER. PER.          1         2         4         8        12        24        96       168       360       720
UPPER LIM.   1.00E-01  1.00E-01  1.00E-01  1.00E-01  1.00E-02  1.00E-02  1.00E-02  1.00E-02  1.00E-02  1.00E-02
  LOW LIM.   1.00E-05  1.00E-05  1.00E-05  1.00E-05  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	14541.	16377.	19154.	23420.	26801.	33431.	42956.	43231.	43075.	42462.
BELOW RANGE	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
ZERO	29104.	27251.	24442.	20112.	16800.	10150.	468.	12.	0.	0.
TOTAL X/Qs	43645.	43628.	43596.	43532.	43601.	43581.	43424.	43243.	43075.	42462.
% NON ZERO	33.32	37.54	43.94	53.80	61.47	76.71	98.92	99.97	100.00	100.00

95th PERCENTILE X/Q VALUES

9.40E-03	9.13E-03	8.54E-03	7.87E-03	6.29E-03	4.43E-03	2.70E-03	2.33E-03	2.00E-03	1.85E-03

95% X/Q for standard averaging intervals

0 to 2 hours	9.40E-03
2 to 8 hours	7.36E-03
8 to 24 hours	2.72E-03
1 to 4 days	2.12E-03
4 to 30 days	1.72E-03

	HOURLY VALUE RANGE	
	MAX X/Q	MIN X/Q
CENTERLINE	1.06E-02	8.26E-04
SECTOR-AVERAGE	6.19E-03	4.82E-04

NORMAL PROGRAM COMPLETION

pal17.log

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.

NRC Contacts: J. Y. Lee Phone: (301) 415 1080
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L. A Brown Phone: (301) 415 1232
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Code Developer: J. V. Ramsdell Phone: (509) 372 6316
e-mail: j_ramsdell@pnl.gov

```
Code Documentation:  NUREG/CR-6331 Rev. 1

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party would not infringe privately owned rights.

Program Run   6/28/2004  at  18:14:12

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

    Number of Meteorological Data Files  =  1
    Meteorological Data File Names
      C:\ARCON96\PAL\PAL9903.MET

    Height of lower wind instrument (m)  =     10.1
    Height of upper wind instrument (m)  =     57.8
    Wind speeds entered as meters/second

    Ground-level release
    Release height (m)                   =     20.4
    Building Area (m^2)                  =   1405.0
    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)  =      161
    Wind direction sector width (deg)    =       90
    Wind direction window (deg)          =   116 - 206
    Distance to intake (m)               =     23.1
    Intake height  (m)                   =     22.5
    Terrain elevation difference (m)     =       .0

    Output file names
      pal17.log
      pal17.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                   =    179
    Hours direction in window               =  13984
    Hours elevated plume w/ dir. in window  =      0
    Hours of calm winds                     =    254
    Hours direction not in window or calm   =  29407

    DISTRIBUTION SUMMARY DATA BY AVERAGING INTERVAL
  AVER. PER.          1         2         4         8        12        24        96       168       360       720
  UPPER LIM.   1.00E-01  1.00E-01  1.00E-01  1.00E-01  1.00E-01  1.00E-01  1.00E-01  1.00E-01  1.00E-01  1.00E-01
    LOW LIM.   1.00E-05  1.00E-05  1.00E-05  1.00E-05  1.00E-05  1.00E-05  1.00E-05  1.00E-05  1.00E-05  1.00E-05
ABOVE RANGE          0.        0.        0.        0.        0.        0.        0.        0.        0.        0.
   IN RANGE      14238.    16020.    18702.    22816.    26130.    32731.    42833.    43231.    43075.    42462.
BELOW RANGE          0.        0.        0.        0.        0.        0.        0.        0.        0.        0.
       ZERO      29407.    27608.    24894.    20716.    17471.    10850.      591.       12.        0.        0.
 TOTAL X/Qs      43645.    43628.    43596.    43532.    43601.    43581.    43424.    43243.    43075.    42462.
 % NON ZERO       32.62     36.72     42.90     52.41     59.93     75.10     98.64     99.97    100.00    100.00

    95th PERCENTILE X/Q VALUES
              1.25E-02  1.21E-02  1.15E-02  1.05E-02  8.41E-03  5.91E-03  3.63E-03  3.12E-03  2.66E-03  2.46E-03

    95% X/Q for standard averaging intervals

    0 to 2 hours        1.25E-02
    2 to 8 hours        9.83E-03
    8 to 24 hours       3.62E-03
    1 to 4 days         2.86E-03
    4 to 30 days        2.28E-03

                           HOURLY VALUE RANGE
                         MAX X/Q              MIN X/Q
        CENTERLINE       1.43E-02             1.10E-03
        SECTOR-AVERAGE   8.31E-03             6.40E-04

NORMAL PROGRAM COMPLETION
```

pal18.log

```
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.

NRC Contacts:   J. Y. Lee       Phone: (301) 415 1080
                                e-mail: jyl1@nrc.gov
                J. J. Hayes     Phone: (301) 415 3167
                                e-mail: jjh@nrc.gov
                L. A  Brown     Phone: (301) 415 1232
                                e-mail: lab2@nrc.gov

Code Developer: J. V. Ramsdell  Phone: (509) 372 6316
                                e-mail: j_ramsdell@pnl.gov

Code Documentation:  NUREG/CR-6331 Rev. 1

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party would not infringe privately owned rights.

Program Run   6/ 9/2004  at  15:23:09

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

    Number of Meteorological Data Files  =  1
    Meteorological Data File Names
      C:\ARCON96\PAL\PAL9903.MET

    Height of lower wind instrument (m)  =     10.1
    Height of upper wind instrument (m)  =     57.8
    Wind speeds entered as meters/second

    Ground-level release
    Release height (m)                   =     20.4
    Building Area (m^2)                  =   1405.0
    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)  =      204
    Wind direction sector width (deg)    =       90
    Wind direction window (deg)          =   159 - 249
    Distance to intake (m)               =     95.4
    Intake height  (m)                   =     14.9
```

```
  Terrain elevation difference (m)     =       .0

  Output file names
    pal18.log
    pal18.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                   =    179
  Hours direction in window               =  12090
  Hours elevated plume w/ dir. in window  =      0
  Hours of calm winds                     =    254
  Hours direction not in window or calm   =  31301

  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     12344.     14165.     16811.     20687.     23730.     30246.     42115.     43046.     43075.     42462.
BELOW RANGE         0.         0.         0.         0.         0.         0.       512.         0.         0.         0.
      ZERO      31301.     29463.     26785.     22845.     19871.     13335.       797.       197.         0.         0.
 TOTAL X/Qs     43645.     43628.     43596.     43532.     43601.     43581.     43424.     43243.     43075.     42462.
 % NON ZERO      28.28      32.47      38.56      47.52      54.43      69.40      98.16      99.54     100.00     100.00

  95th PERCENTILE X/Q VALUES
             7.32E-04   7.15E-04   6.85E-04   6.43E-04   5.22E-04   3.78E-04   2.26E-04   1.91E-04   1.57E-04   1.42E-04

  95% X/Q for standard averaging intervals

  0 to 2 hours        7.32E-04
  2 to 8 hours        6.13E-04
  8 to 24 hours       2.45E-04
  1 to 4 days         1.75E-04
  4 to 30 days        1.29E-04

                          HOURLY VALUE RANGE
                        MAX X/Q              MIN X/Q
     CENTERLINE         9.19E-04             1.08E-04
```

```
         SECTOR-AVERAGE     5.36E-04              6.31E-05

NORMAL PROGRAM COMPLETION
```

pal19.log

```
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.

NRC Contacts:   J. Y. Lee       Phone: (301) 415 1080
                                e-mail: jyl1@nrc.gov
                J. J. Hayes     Phone: (301) 415 3167
                                e-mail: jjh@nrc.gov
                L. A  Brown     Phone: (301) 415 1232
                                e-mail: lab2@nrc.gov

Code Developer: J. V. Ramsdell  Phone: (509) 372 6316
                                e-mail: j_ramsdell@pnl.gov

Code Documentation:  NUREG/CR-6331 Rev. 1

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Program Run   9/ 8/2004  at  16:20:50

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

    Number of Meteorological Data Files  =  1
    Meteorological Data File Names
      C:\ARCON96\PAL\PAL9903.MET

    Height of lower wind instrument (m)  =     10.1
    Height of upper wind instrument (m)  =     57.8
    Wind speeds entered as meters/second
```

```
  Ground-level release
  Release height (m)                    =     27.4
  Building Area (m^2)                   =       .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)   =      257
  Wind direction sector width (deg)     =       90
  Wind direction window (deg)           =   212 - 302
  Distance to intake (m)                =     20.8
  Intake height  (m)                    =     22.5
  Terrain elevation difference (m)      =       .0

  Output file names
    pal19.log
    pal19.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                   =    179
  Hours direction in window               =  11743
  Hours elevated plume w/ dir. in window  =      0
  Hours of calm winds                     =    254
  Hours direction not in window or calm   =  31648

  DISTRIBUTION SUMMARY DATA BY AVERAGING INTERVAL
 AVER. PER.          1         2         4         8        12        24        96       168       360       720
 UPPER LIM.   1.00E-01  1.00E-01  1.00E-01  1.00E-01  1.00E-01  1.00E-01  1.00E-01  1.00E-01  1.00E-01  1.00E-01
   LOW LIM.   1.00E-05  1.00E-05  1.00E-05  1.00E-05  1.00E-05  1.00E-05  1.00E-05  1.00E-05  1.00E-05  1.00E-05
ABOVE RANGE         0.        0.        0.        0.        0.        0.        0.        0.        0.        0.
   IN RANGE     11997.    13746.    16523.    20764.    24131.    30845.    42285.    43176.    43075.    42462.
BELOW RANGE         0.        0.        0.        0.        0.        0.        0.        0.        0.        0.
       ZERO     31648.    29882.    27073.    22768.    19470.    12736.     1139.       67.       0.        0.
 TOTAL X/Qs     43645.    43628.    43596.    43532.    43601.    43581.    43424.    43243.    43075.    42462.
 % NON ZERO      27.49     31.51     37.90     47.70     55.35     70.78     97.38     99.85    100.00    100.00

  95th PERCENTILE X/Q VALUES
```

```
                1.31E-02   1.30E-02   1.25E-02   1.17E-02   9.67E-03   7.03E-03   3.91E-03   3.30E-03   2.87E-03   2.57E-03

    95% X/Q for standard averaging intervals

    0 to 2 hours        1.31E-02
    2 to 8 hours        1.13E-02
    8 to 24 hours       4.68E-03
    1 to 4 days         2.87E-03
    4 to 30 days        2.36E-03

                            HOURLY VALUE RANGE
                          MAX X/Q               MIN X/Q
        CENTERLINE        3.49E-02              1.83E-03
        SECTOR-AVERAGE    1.89E-02              1.07E-03

NORMAL PROGRAM COMPLETION
```

pal20.log

```
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.

NRC Contacts:   J. Y. Lee       Phone: (301) 415 1080
                                e-mail: jyl1@nrc.gov
                J. J. Hayes     Phone: (301) 415 3167
                                e-mail: jjh@nrc.gov
                L. A  Brown     Phone: (301) 415 1232
                                e-mail: lab2@nrc.gov

Code Developer: J. V. Ramsdell  Phone: (509) 372 6316
                                e-mail: j_ramsdell@pnl.gov

Code Documentation:  NUREG/CR-6331 Rev. 1

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```

```
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Program Run   9/ 8/2004  at  16:21:44

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

    Number of Meteorological Data Files  =  1
    Meteorological Data File Names
      C:\ARCON96\PAL\PAL9903.MET

    Height of lower wind instrument (m)  =     10.1
    Height of upper wind instrument (m)  =     57.8
    Wind speeds entered as meters/second

    Ground-level release
    Release height (m)                   =     27.4
    Building Area (m^2)                  =       .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)  =      264
    Wind direction sector width (deg)    =       90
    Wind direction window (deg)          =   219 - 309
    Distance to intake (m)               =     25.2
    Intake height  (m)                   =     22.5
    Terrain elevation difference (m)     =       .0

    Output file names
      pal20.log
      pal20.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                   =    179
    Hours direction in window               =  12353
    Hours elevated plume w/ dir. in window  =      0
    Hours of calm winds                     =    254
    Hours direction not in window or calm   =  31038
```

```
   DISTRIBUTION SUMMARY DATA BY AVERAGING INTERVAL
  AVER. PER.          1          2          4          8         12         24         96        168        360        720
  UPPER LIM.   1.00E-01   1.00E-01   1.00E-01   1.00E-01   1.00E-01   1.00E-01   1.00E-01   1.00E-01   1.00E-01   1.00E-01
    LOW LIM.   1.00E-05   1.00E-05   1.00E-05   1.00E-05   1.00E-05   1.00E-05   1.00E-05   1.00E-05   1.00E-05   1.00E-05
ABOVE RANGE         0.         0.         0.         0.         0.         0.         0.         0.         0.         0.
   IN RANGE     12607.     14399.     17179.     21374.     24800.     31616.     42528.     43179.     43075.     42462.
BELOW RANGE         0.         0.         0.         0.         0.         0.         0.         0.         0.         0.
       ZERO     31038.     29229.     26417.     22158.     18801.     11965.       896.        64.         0.         0.
 TOTAL X/Qs     43645.     43628.     43596.     43532.     43601.     43581.     43424.     43243.     43075.     42462.
 % NON ZERO      28.89      33.00      39.40      49.10      56.88      72.55      97.94      99.85     100.00     100.00

  95th PERCENTILE X/Q VALUES
             9.09E-03   9.05E-03   8.86E-03   8.38E-03   6.94E-03   5.08E-03   2.79E-03   2.43E-03   2.10E-03   1.88E-03

  95% X/Q for standard averaging intervals

  0 to 2 hours        9.09E-03
  2 to 8 hours        8.14E-03
  8 to 24 hours       3.43E-03
  1 to 4 days         2.02E-03
  4 to 30 days        1.74E-03

                          HOURLY VALUE RANGE
                         MAX X/Q              MIN X/Q
       CENTERLINE       2.49E-02             1.31E-03
       SECTOR-AVERAGE   1.34E-02             7.61E-04

NORMAL PROGRAM COMPLETION
```

pal21.log

```
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.

NRC Contacts:   J. Y. Lee       Phone: (301) 415 1080
                                e-mail: jyl1@nrc.gov
                J. J. Hayes     Phone: (301) 415 3167
                                e-mail: jjh@nrc.gov
```

L. A Brown Phone: (301) 415 1232
e-mail: lab2@nrc.gov

Code Developer: J. V. Ramsdell Phone: (509) 372 6316
e-mail: j_ramsdell@pnl.gov

Code Documentation: NUREG/CR-6331 Rev. 1

Program Run 9/ 8/2004 at 16:22:40

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

Number of Meteorological Data Files = 1
Meteorological Data File Names
C:\ARCON96\PAL\PAL9903.MET

Height of lower wind instrument (m) = 10.1
Height of upper wind instrument (m) = 57.8
Wind speeds entered as meters/second

Ground-level release
Release height (m) = 27.4
Building Area (m^2) = .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) = 227
Wind direction sector width (deg) = 90
Wind direction window (deg) = 182 - 272
Distance to intake (m) = 99.1
Intake height (m) = 14.9
Terrain elevation difference (m) = .0

Output file names
pal21.log
pal21.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                =    179
    Hours direction in window            =  11051
    Hours elevated plume w/ dir. in window  =      0
    Hours of calm winds                  =    254
    Hours direction not in window or calm   =  32340

    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      11305.     13103.     15823.     19841.     22918.     29353.     41831.     42948.     43075.     42462.
 BELOW RANGE          0.         0.         0.         0.         0.         0.         0.         3.         0.         0.
       ZERO       32340.     30525.     27773.     23691.     20683.     14228.      1593.       292.         0.         0.
  TOTAL X/Qs      43645.     43628.     43596.     43532.     43601.     43581.     43424.     43243.     43075.     42462.
  % NON ZERO       25.90      30.03      36.29      45.58      52.56      67.35      96.33      99.32     100.00     100.00

    95th PERCENTILE X/Q VALUES
              7.92E-04   7.62E-04   7.23E-04   6.81E-04   5.59E-04   3.99E-04   2.30E-04   1.88E-04   1.63E-04   1.44E-04

    95% X/Q for standard averaging intervals

    0 to 2 hours        7.92E-04
    2 to 8 hours        6.43E-04
    8 to 24 hours       2.58E-04
    1 to 4 days         1.74E-04
    4 to 30 days        1.30E-04

                            HOURLY VALUE RANGE
                          MAX X/Q              MIN X/Q
        CENTERLINE        1.90E-03             1.17E-04
        SECTOR-AVERAGE    9.87E-04             6.83E-05

NORMAL PROGRAM COMPLETION
```

pal22.log

```
 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.

 NRC Contacts:   J. Y. Lee       Phone: (301) 415 1080
                                 e-mail: jyl1@nrc.gov
                 J. J. Hayes     Phone: (301) 415 3167
                                 e-mail: jjh@nrc.gov
                 L. A  Brown     Phone: (301) 415 1232
                                 e-mail: lab2@nrc.gov

 Code Developer: J. V. Ramsdell  Phone: (509) 372 6316
                                 e-mail: j_ramsdell@pnl.gov

 Code Documentation:  NUREG/CR-6331 Rev. 1

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 party would not infringe privately owned rights.

 Program Run   9/ 8/2004  at  16:23:29

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

     Number of Meteorological Data Files  =  1
     Meteorological Data File Names
       C:\ARCON96\PAL\PAL9903.MET

     Height of lower wind instrument (m)  =     10.1
     Height of upper wind instrument (m)  =     57.8
     Wind speeds entered as meters/second

     Ground-level release
     Release height (m)                   =     27.4
     Building Area (m^2)                  =       .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)  =      266
  Wind direction sector width (deg)    =       90
  Wind direction window (deg)          =   221 - 311
  Distance to intake (m)               =     22.3
  Intake height  (m)                   =     22.5
  Terrain elevation difference (m)     =       .0

  Output file names
    pal22.log
    pal22.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                   =    179
  Hours direction in window               =  12473
  Hours elevated plume w/ dir. in window  =      0
  Hours of calm winds                     =    254
  Hours direction not in window or calm   =  30918

  DISTRIBUTION SUMMARY DATA BY AVERAGING INTERVAL
 AVER. PER.          1         2         4         8        12        24        96       168       360       720
 UPPER LIM.   1.00E-01  1.00E-01  1.00E-01  1.00E-01  1.00E-01  1.00E-01  1.00E-01  1.00E-01  1.00E-01  1.00E-01
   LOW LIM.   1.00E-05  1.00E-05  1.00E-05  1.00E-05  1.00E-05  1.00E-05  1.00E-05  1.00E-05  1.00E-05  1.00E-05
ABOVE RANGE         0.        0.        0.        0.        0.        0.        0.        0.        0.        0.
   IN RANGE     12727.    14520.    17321.    21553.    24992.    31756.    42540.    43180.    43075.    42462.
BELOW RANGE         0.        0.        0.        0.        0.        0.        0.        0.        0.        0.
      ZERO      30918.    29108.    26275.    21979.    18609.    11825.      884.       63.        0.        0.
 TOTAL X/Qs     43645.    43628.    43596.    43532.    43601.    43581.    43424.    43243.    43075.    42462.
 % NON ZERO      29.16     33.28     39.73     49.51     57.32     72.87     97.96     99.85    100.00    100.00

  95th PERCENTILE X/Q VALUES
             1.10E-02  1.09E-02  1.08E-02  1.04E-02  8.63E-03  6.36E-03  3.53E-03  3.00E-03  2.62E-03  2.35E-03

  95% X/Q for standard averaging intervals
```

```
    0 to 2 hours        1.10E-02
    2 to 8 hours        1.02E-02
    8 to 24 hours       4.33E-03
    1 to 4 days         2.58E-03
    4 to 30 days        2.17E-03

                            HOURLY VALUE RANGE
                          MAX X/Q               MIN X/Q
        CENTERLINE        3.09E-02              1.62E-03
        SECTOR-AVERAGE    1.67E-02              9.45E-04

NORMAL PROGRAM COMPLETION
```

pal23.log

```
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.

NRC Contacts:   J. Y. Lee       Phone: (301) 415 1080
                                e-mail: jyl1@nrc.gov
                J. J. Hayes     Phone: (301) 415 3167
                                e-mail: jjh@nrc.gov
                L. A  Brown     Phone: (301) 415 1232
                                e-mail: lab2@nrc.gov

Code Developer: J. V. Ramsdell  Phone: (509) 372 6316
                                e-mail: j_ramsdell@pnl.gov

Code Documentation:  NUREG/CR-6331 Rev. 1

The program was prepared for an agency of the United States Government. Neither
the United States Government nor any agency thereof, nor any of their
employees, makes any warranty, expressed or implied, or assumes any legal
liability or responsibilities for any third party's use, or the results of such
use, of any portion of this program or represents that its use by such third
party would not infringe privately owned rights.

Program Run   9/ 8/2004  at  16:24:21
```

```
******* ARCON INPUT **********

   Number of Meteorological Data Files  =  1
   Meteorological Data File Names
     C:\ARCON96\PAL\PAL9903.MET

   Height of lower wind instrument (m)  =     10.1
   Height of upper wind instrument (m)  =     57.8
   Wind speeds entered as meters/second

   Ground-level release
   Release height (m)                   =     27.4
   Building Area (m^2)                  =       .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)  =      271
   Wind direction sector width (deg)    =       90
   Wind direction window (deg)          =   226 - 316
   Distance to intake (m)               =     27.0
   Intake height  (m)                   =     22.5
   Terrain elevation difference (m)     =       .0

   Output file names
     pal23.log
     pal23.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                   =    179
   Hours direction in window               =  12493
   Hours elevated plume w/ dir. in window  =      0
   Hours of calm winds                     =    254
   Hours direction not in window or calm   =  30898

   DISTRIBUTION SUMMARY DATA BY AVERAGING INTERVAL
  AVER. PER.           1          2          4          8         12         24         96        168        360        720
  UPPER LIM.    1.00E-01   1.00E-01   1.00E-01   1.00E-01   1.00E-01   1.00E-01   1.00E-01   1.00E-01   1.00E-01   1.00E-01
```

LOW LIM.	1.00E-05	1.00E-05	1.00E-05	1.00E-05	1.00E-05	1.00E-05	1.00E-05	1.00E-05	1.00E-05	1.00E-05
ABOVE RANGE	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
IN RANGE	12747.	14566.	17410.	21742.	25257.	32191.	42594.	43181.	43075.	42462.
BELOW RANGE	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
ZERO	30898.	29062.	26186.	21790.	18344.	11390.	830.	62.	0.	0.
TOTAL X/Qs	43645.	43628.	43596.	43532.	43601.	43581.	43424.	43243.	43075.	42462.
% NON ZERO	29.21	33.39	39.93	49.94	57.93	73.86	98.09	99.86	100.00	100.00

95th PERCENTILE X/Q VALUES

8.20E-03	8.07E-03	7.70E-03	7.34E-03	6.11E-03	4.51E-03	2.48E-03	2.13E-03	1.86E-03	1.69E-03

95% X/Q for standard averaging intervals

0 to 2 hours	8.20E-03
2 to 8 hours	7.06E-03
8 to 24 hours	3.09E-03
1 to 4 days	1.80E-03
4 to 30 days	1.57E-03

	HOURLY VALUE RANGE	
	MAX X/Q	MIN X/Q
CENTERLINE	2.20E-02	1.15E-03
SECTOR-AVERAGE	1.18E-02	6.72E-04

NORMAL PROGRAM COMPLETION

pal24.log

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.

NRC Contacts: J. Y. Lee Phone: (301) 415 1080
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e-mail: lab2@nrc.gov

Code Developer: J. V. Ramsdell Phone: (509) 372 6316

```
                                e-mail: j_ramsdell@pnl.gov

 Code Documentation:  NUREG/CR-6331 Rev. 1

 The program was prepared for an agency of the United States Government. Neither
 the United States Government nor any agency thereof, nor any of their
 employees, makes any warranty, expressed or implied, or assumes any legal
 liability or responsibilities for any third party's use, or the results of such
 use, of any portion of this program or represents that its use by such third
 party would not infringe privately owned rights.

 Program Run   9/ 8/2004  at  16:25:05

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

     Number of Meteorological Data Files  =  1
     Meteorological Data File Names
       C:\ARCON96\PAL\PAL9903.MET

     Height of lower wind instrument (m)  =     10.1
     Height of upper wind instrument (m)  =     57.8
     Wind speeds entered as meters/second

     Ground-level release
     Release height (m)                   =     27.4
     Building Area (m^2)                  =       .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)  =      229
     Wind direction sector width (deg)    =       90
     Wind direction window (deg)          =   184 - 274
     Distance to intake (m)               =     98.6
     Intake height  (m)                   =     14.9
     Terrain elevation difference (m)     =       .0

     Output file names
       pal24.log
       pal24.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                   =    179
   Hours direction in window               =  11025
   Hours elevated plume w/ dir. in window  =      0
   Hours of calm winds                     =    254
   Hours direction not in window or calm   =  32366

   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     11279.    13054.    15752.    19769.    22874.    29366.    41826.    42951.    43075.    42462.
BELOW RANGE         0.        0.        0.        0.        0.        0.        0.        3.        0.        0.
       ZERO     32366.    30574.    27844.    23763.    20727.    14215.     1598.      289.        0.        0.
 TOTAL X/Qs     43645.    43628.    43596.    43532.    43601.    43581.    43424.    43243.    43075.    42462.
 % NON ZERO      25.84     29.92     36.13     45.41     52.46     67.38     96.32     99.33    100.00    100.00

   95th PERCENTILE X/Q VALUES
             7.99E-04  7.66E-04  7.28E-04  6.82E-04  5.61E-04  3.99E-04  2.31E-04  1.86E-04  1.65E-04  1.45E-04

   95% X/Q for standard averaging intervals

   0 to 2 hours        7.99E-04
   2 to 8 hours        6.43E-04
   8 to 24 hours       2.57E-04
   1 to 4 days         1.75E-04
   4 to 30 days        1.32E-04

                          HOURLY VALUE RANGE
                        MAX X/Q              MIN X/Q
       CENTERLINE       1.92E-03             1.18E-04
       SECTOR-AVERAGE   9.97E-04             6.90E-05

NORMAL PROGRAM COMPLETION
```

ATTACHMENT B

PAVAN Case Run – pals01

```
1USNRC COMPUTER CODE-PAVAN, VERSION 2.0-NAI FIXED 10/15/02          RUN DATE: Wed Apr 14 10:41:55 2004

0PRINTOUT OF INPUT CARDS

    1     00000 01101 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000
    2     Palisades            1999-2003          Ground Level Release
    3     10 Meters        DT from 10m to 60m
    4     Data from onsite met tower
    5     NONE
    6          7 43550     0
    7          0.500  2011.000    58.500    10.000    10.100
    8       2.000  1.000  2.000 53.000 45.000 17.000  5.000
    9      17.000 17.000  9.000 17.000  9.000 13.000 13.000 22.000 35.000 17.000 17.000 31.000 65.000 83.000118.000 35.000
    9      52.000 48.000 78.000 57.000 57.000 74.000 92.000196.000131.000 83.000200.000414.000375.000501.000702.000553.000
    9      48.000 31.000 39.000 31.000 61.000109.000174.000192.000126.000 35.000353.000292.000131.000118.000270.000488.000
    9      13.000  0.000  9.000  9.000 13.000 26.000 52.000 52.000 13.000  0.000 26.000 17.000 13.000 17.000 26.000 65.000
    9       0.000  0.000  0.000  0.000  4.000  0.000  9.000  9.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000 13.000
    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  4.000  4.000  0.000  9.000  4.000  4.000  4.000 22.000 17.000 22.000 13.000 22.000
    9      17.000 13.000 13.000  9.000  9.000 13.000 17.000 26.000 35.000 26.000 61.000 48.000 35.000 31.000 61.000 61.000
    9      17.000  9.000 17.000 17.000 17.000 31.000 44.000 44.000 26.000 13.000 96.000 70.000 22.000 39.000 57.000 78.000
    9       4.000  0.000  4.000  4.000  9.000  9.000 22.000 13.000  0.000  0.000 13.000  4.000  9.000  9.000 17.000 26.000
    9       0.000  0.000  0.000  0.000  4.000  4.000  4.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  4.000
    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  9.000  9.000  4.000  0.000  4.000  0.000  4.000 13.000  0.000  9.000 13.000 13.000 13.000 26.000 17.000
    9      31.000 22.000 17.000 13.000 13.000 13.000 17.000 39.000 52.000 31.000 87.000 39.000 39.000 35.000 57.000 96.000
    9      26.000 13.000 17.000 13.000 31.000 39.000 65.000 65.000 44.000 13.000105.000 61.000 35.000 61.000 70.000 74.000
    9      13.000  4.000  4.000  9.000 13.000 26.000 35.000 31.000  4.000  4.000 26.000 13.000  9.000 22.000 35.000 35.000
    9       0.000  0.000  0.000  0.000  0.000  4.000  4.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  4.000
    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      70.000 61.000 74.000 70.000 57.000 48.000 48.000 78.000 87.000 74.000 61.000 87.000 52.000 61.000109.000135.000
    9     266.000214.000231.000192.000183.000161.000231.000379.000449.000288.000322.000205.000200.000227.000279.000440.000
    9     331.000183.000148.000209.000266.000366.000436.000566.000288.000275.000806.000453.000549.000767.000636.000580.000
    9     126.000 22.000 44.000109.000148.000288.000292.000248.000 44.000 26.000270.000270.000458.000475.000619.000488.000
    9      13.000  0.000  0.000  0.000 26.000 61.000 57.000 22.000  0.000  0.000  4.000 31.000100.000 39.000135.000118.000
    9       0.000  0.000  0.000  0.000  0.000  9.000  0.000  0.000  0.000  0.000  0.000  0.000 13.000  4.000 13.000  4.000
    9     118.000 87.000 83.000 65.000 61.000 78.000 83.000144.000157.000 92.000 74.000 57.000 57.000 57.000105.000131.000
    9     379.000257.000209.000183.000196.000218.000322.000558.000610.000362.000257.000222.000161.000166.000179.000309.000
    9     113.000 70.000 39.000 57.000153.000209.000340.000458.000192.000179.000288.000209.000187.000148.000122.000148.000
    9       4.000  0.000  9.000 13.000 31.000 57.000122.000118.000 13.000  9.000 70.000 74.000 57.000 39.000 35.000 26.000
    9       0.000  0.000  0.000  0.000  9.000 17.000 17.000 13.000  0.000  0.000  4.000  4.000  9.000  0.000  0.000  4.000
    9       0.000  0.000  0.000  0.000  0.000  4.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000
    9      57.000 39.000 52.000 44.000 52.000 52.000 78.000122.000131.000 44.000 35.000 35.000 26.000 22.000 39.000 48.000
    9      87.000113.000135.000126.000179.000196.000275.000410.000279.000135.000 61.000 48.000 26.000 31.000 22.000 39.000
    9       9.000  4.000  9.000 17.000 35.000 39.000 96.000 92.000 13.000 13.000  9.000  9.000 26.000  9.000  4.000  4.000
    9       0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  4.000  9.000  0.000  0.000  0.000
    9       0.000  0.000  0.000  0.000  4.000  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      22.000 17.000 13.000 26.000 35.000 35.000 48.000105.000118.000 44.000 22.000  9.000  9.000 17.000  9.000 13.000
    9      26.000 31.000 74.000135.000170.000253.000462.000601.000514.000153.000 26.000  4.000 13.000  9.000 13.000 22.000
    9       4.000  4.000  4.000 13.000 17.000 35.000 35.000 65.000 35.000  4.000  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         -1.  0.100  1.500  3.000  5.000  7.500 10.000 15.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000
   11        677.   677.   677.   677.   677.   677.   677.   677.   677.   677.   677.   677.   677.   677.   677.   677.
   11       4820.  4820.  4820.  4820.  4820.  4820.  4820.  4820.  4820.  4820.  4820.  4820.  4820.  4820.  4820.  4820.
1USNRC COMPUTER CODE-PAVAN, VERSION 2.0          RUN DATE: Wed Apr 14 10:41:55 2004

/PLANT NAME: Palisades                           METEOROLOGICAL INSTRUMENTATION
 DATA PERIOD:  1999-2003                         WIND SENSORS HEIGHT: 10 Meters       DT
 TYPE OF RELEASE: Ground Level Release           DELTA-T HEIGHTS: from 10m to 60m
 SOURCE OF DATA: Data from onsite met tower
 COMMENTS: NONE
 PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145
0JOINT FREQUENCY DISTRIBUTION OF WIND SPEED AND DIRECTION          ATMOSPHERIC STABILITY CLASS A
 WIND SPEED (M/S)
 TOWER RELEASE      N    NNE     NE    ENE      E    ESE     SE    SSE      S    SSW     SW    WSW      W    WNW     NW    NNW  TOTAL
  0.10  0.10    0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.001  0.001  0.001  0.000  0.005
  1.50  1.50    0.039  0.039  0.021  0.039  0.021  0.030  0.030  0.051  0.080  0.039  0.039  0.071  0.149  0.191  0.271  0.080  1.189
  3.00  2.99    0.119  0.110  0.179  0.131  0.131  0.170  0.211  0.450  0.301  0.191  0.459  0.951  0.861  1.150  1.612  1.270  8.296
  5.00  4.99    0.110  0.071  0.090  0.071  0.140  0.250  0.400  0.441  0.289  0.080  0.811  0.670  0.301  0.271  0.620  1.121  5.736
  7.50  7.48    0.030  0.000  0.021  0.021  0.030  0.060  0.119  0.119  0.030  0.000  0.060  0.039  0.030  0.039  0.060  0.149  0.806
 10.00  9.98    0.000  0.000  0.000  0.000  0.009  0.000  0.021  0.021  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.030  0.080
 15.00 14.96    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  0.000
 TOTAL          0.30   0.22   0.31   0.26   0.33   0.51   0.78   1.08   0.70   0.31   1.37   1.73   1.34   1.65   2.56   2.65  16.11

0JOINT FREQUENCY DISTRIBUTION OF WIND SPEED AND DIRECTION          ATMOSPHERIC STABILITY CLASS B
 WIND SPEED (M/S)
 TOWER RELEASE      N    NNE     NE    ENE      E    ESE     SE    SSE      S    SSW     SW    WSW      W    WNW     NW    NNW  TOTAL
  0.10  0.10    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  0.002
  1.50  1.50    0.000  0.000  0.000  0.000  0.009  0.009  0.000  0.021  0.009  0.009  0.009  0.051  0.039  0.051  0.030  0.051  0.287
  3.00  2.99    0.039  0.030  0.030  0.021  0.021  0.030  0.039  0.060  0.080  0.060  0.140  0.110  0.080  0.071  0.140  0.140  1.091
  5.00  4.99    0.039  0.021  0.039  0.039  0.039  0.071  0.101  0.101  0.060  0.030  0.220  0.161  0.051  0.090  0.131  0.179  1.371
  7.50  7.48    0.009  0.000  0.009  0.009  0.021  0.021  0.051  0.030  0.000  0.000  0.030  0.009  0.021  0.021  0.039  0.060  0.328
 10.00  9.98    0.000  0.000  0.000  0.000  0.009  0.009  0.009  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.009  0.037
 15.00 14.96    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  0.000
 TOTAL          0.09   0.05   0.08   0.07   0.10   0.14   0.20   0.21   0.15   0.10   0.40   0.33   0.19   0.23   0.34   0.44   3.12

0JOINT FREQUENCY DISTRIBUTION OF WIND SPEED AND DIRECTION          ATMOSPHERIC STABILITY CLASS C
 WIND SPEED (M/S)
 TOWER RELEASE      N    NNE     NE    ENE      E    ESE     SE    SSE      S    SSW     SW    WSW      W    WNW     NW    NNW  TOTAL
  0.10  0.10    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  0.001  0.001  0.005
  1.50  1.50    0.009  0.021  0.021  0.009  0.000  0.009  0.000  0.009  0.030  0.000  0.021  0.030  0.030  0.030  0.060  0.039  0.317
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3.00	2.99	0.071	0.051	0.039	0.030	0.030	0.030	0.039	0.090	0.119	0.071	0.200	0.090	0.090	0.080	0.131	0.220	1.380
5.00	4.99	0.060	0.030	0.039	0.030	0.071	0.090	0.149	0.149	0.101	0.030	0.241	0.140	0.080	0.140	0.161	0.170	1.681
7.50	7.48	0.030	0.009	0.009	0.021	0.030	0.060	0.080	0.071	0.009	0.009	0.060	0.030	0.021	0.051	0.080	0.080	0.650
10.00	9.98	0.000	0.000	0.000	0.000	0.000	0.009	0.009	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.009	0.028
15.00	14.96	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	0.000
TOTAL		0.17	0.11	0.11	0.09	0.13	0.20	0.28	0.32	0.26	0.11	0.52	0.29	0.22	0.30	0.43	0.52	4.06

0JOINT FREQUENCY DISTRIBUTION OF WIND SPEED AND DIRECTION ATMOSPHERIC STABILITY CLASS D
WIND SPEED (M/S)

TOWER	RELEASE	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
0.10	0.10	0.007	0.006	0.008	0.007	0.006	0.005	0.005	0.008	0.009	0.008	0.006	0.009	0.005	0.006	0.011	0.014	0.122
1.50	1.50	0.161	0.140	0.170	0.161	0.131	0.110	0.110	0.179	0.200	0.170	0.140	0.200	0.119	0.140	0.250	0.310	2.691
3.00	2.99	0.611	0.491	0.530	0.441	0.420	0.370	0.530	0.870	1.031	0.661	0.739	0.471	0.459	0.521	0.641	1.010	9.798
5.00	4.99	0.760	0.420	0.340	0.480	0.611	0.840	1.001	1.300	0.661	0.631	1.851	1.040	1.261	1.761	1.460	1.332	15.750
7.50	7.48	0.289	0.051	0.101	0.250	0.340	0.661	0.670	0.569	0.101	0.060	0.620	0.620	1.052	1.091	1.421	1.121	9.017
10.00	9.98	0.030	0.000	0.000	0.000	0.060	0.140	0.131	0.051	0.000	0.000	0.009	0.071	0.230	0.090	0.310	0.271	1.392
15.00	14.96	0.000	0.000	0.000	0.000	0.000	0.021	0.000	0.000	0.000	0.000	0.000	0.000	0.030	0.009	0.030	0.009	0.099
TOTAL		1.86	1.11	1.15	1.34	1.57	2.15	2.45	2.98	2.00	1.53	3.37	2.41	3.16	3.62	4.12	4.07	38.87

0JOINT FREQUENCY DISTRIBUTION OF WIND SPEED AND DIRECTION ATMOSPHERIC STABILITY CLASS E
WIND SPEED (M/S)

TOWER	RELEASE	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
0.10	0.10	0.008	0.006	0.006	0.005	0.004	0.006	0.006	0.010	0.011	0.007	0.005	0.004	0.004	0.004	0.007	0.009	0.103
1.50	1.49	0.271	0.200	0.191	0.149	0.140	0.179	0.191	0.331	0.361	0.211	0.170	0.131	0.131	0.131	0.241	0.301	3.327
3.00	2.99	0.870	0.590	0.480	0.420	0.450	0.501	0.739	1.281	1.401	0.831	0.590	0.510	0.370	0.381	0.411	0.710	10.535
5.00	4.98	0.259	0.161	0.090	0.131	0.351	0.480	0.781	1.052	0.441	0.411	0.661	0.480	0.429	0.340	0.280	0.340	6.687
7.50	7.46	0.009	0.000	0.021	0.030	0.071	0.131	0.280	0.271	0.030	0.021	0.161	0.170	0.131	0.090	0.080	0.060	1.555
10.00	9.95	0.000	0.000	0.000	0.000	0.021	0.039	0.039	0.030	0.000	0.000	0.009	0.009	0.021	0.000	0.000	0.009	0.177
15.00	14.93	0.000	0.000	0.000	0.000	0.000	0.009	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.009
TOTAL		1.42	0.96	0.79	0.73	1.04	1.34	2.04	2.97	2.24	1.48	1.60	1.30	1.09	0.95	1.02	1.43	22.39

0JOINT FREQUENCY DISTRIBUTION OF WIND SPEED AND DIRECTION ATMOSPHERIC STABILITY CLASS F
WIND SPEED (M/S)

TOWER	RELEASE	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
0.10	0.10	0.003	0.002	0.002	0.002	0.002	0.002	0.003	0.005	0.006	0.002	0.002	0.002	0.001	0.001	0.002	0.002	0.039
1.50	1.49	0.131	0.090	0.119	0.101	0.119	0.119	0.179	0.280	0.301	0.101	0.080	0.080	0.060	0.051	0.090	0.110	2.011
3.00	2.99	0.200	0.259	0.310	0.289	0.411	0.450	0.631	0.941	0.641	0.310	0.140	0.110	0.060	0.071	0.051	0.090	4.964
5.00	4.98	0.021	0.009	0.021	0.039	0.080	0.090	0.220	0.211	0.030	0.030	0.021	0.021	0.060	0.021	0.009	0.009	0.891
7.50	7.46	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.009	0.021	0.000	0.000	0.000	0.030
10.00	9.95	0.000	0.000	0.000	0.000	0.009	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.009
15.00	14.93	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	0.000
TOTAL		0.35	0.36	0.45	0.43	0.62	0.66	1.03	1.44	0.98	0.44	0.24	0.22	0.20	0.14	0.15	0.21	7.94

0JOINT FREQUENCY DISTRIBUTION OF WIND SPEED AND DIRECTION ATMOSPHERIC STABILITY CLASS G
WIND SPEED (M/S)

TOWER	RELEASE	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
0.10	0.10	0.000	0.000	0.000	0.001	0.001	0.001	0.001	0.002	0.002	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.011

1.50	1.49	0.051	0.039	0.030	0.060	0.080	0.080	0.110	0.241	0.271	0.101	0.051	0.021	0.021	0.039	0.021	0.030	1.245
3.00	2.99	0.060	0.071	0.170	0.310	0.390	0.581	1.061	1.380	1.180	0.351	0.060	0.009	0.030	0.021	0.030	0.051	5.754
5.00	4.98	0.009	0.009	0.009	0.030	0.039	0.080	0.080	0.149	0.080	0.009	0.000	0.000	0.000	0.000	0.000	0.000	0.496
7.50	7.46	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	0.000
10.00	9.95	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	0.000
15.00	14.93	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	0.000
TOTAL		0.12	0.12	0.21	0.40	0.51	0.74	1.25	1.77	1.53	0.46	0.11	0.03	0.05	0.06	0.05	0.08	7.51

0WIND MEASURED AT 10.1 METERS.
WIND SPEED CORRECTED TO THE RELEASE HEIGHT OF 10.0 METERS.
0OVERALL WIND DIRECTION FREQUENCY

WIND DIRECTION:	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW
FREQUENCY:	4.3	2.9	3.1	3.3	4.3	5.7	8.0	10.8	7.9	4.4	7.6	6.3	6.2	7.0	8.7	9.4

0OVERALL WIND SPEED FREQUENCY AS MEASURED ON THE TOWER:

MAX.WIND SPEED (M/S):	0.100	1.500	3.000	5.000	7.500	10.000	15.000
WIND SPEED FREQUENCY:	0.29	11.07	41.82	32.61	12.39	1.72	0.11

0BUILDING AND RELEASE CHARACTERISTICS:
RELEASE HEIGHT: 10.00 METERS
MIXING VOLUME COEFFICIENT: 0.50
BUILDING CROSS-SECTIONAL AREA: 2011.00 SQUARE METERS
0BOUNDARY DISTANCES (METERS) FROM THE SOURCE FOR EACH DOWNWIND SECTOR:

DOWNWIND SECTOR	S	SSW	SW	WSW	W	WNW	NW	NNW	N	NNE	NE	ENE	E	ESE	SE	SSE
BOUNDARY 1	677.	677.	677.	677.	677.	677.	677.	677.	677.	677.	677.	677.	677.	677.	677.	677.
BOUNDARY 2	4820.	4820.	4820.	4820.	4820.	4820.	4820.	4820.	4820.	4820.	4820.	4820.	4820.	4820.	4820.	4820.

1USNRC COMPUTER CODE-PAVAN, VERSION 2.0 RUN DATE: Wed Apr 14 10:41:55 2004

/PLANT NAME: Palisades METEOROLOGICAL INSTRUMENTATION
DATA PERIOD: 1999-2003 WIND SENSORS HEIGHT: 10 Meters DT
TYPE OF RELEASE: Ground Level Release DELTA-T HEIGHTS: from 10m to 60m
SOURCE OF DATA: Data from onsite met tower
COMMENTS: NONE
PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145
0WINDSPEEDS ADJUSTED TO 10.0 METERS.
0PERCENT OF THE TIME A GIVEN WINDSPEED IS LOWER:

0WINDSPEED (METER/SEC)	CUMULATIVE FREQUENCY (PERCENT)
0.10	0.15
0.10	0.29
1.49	6.87
1.50	11.35
2.99	32.61
2.99	53.17
4.98	61.25
4.99	85.78
7.46	87.37
7.48	98.17
9.95	98.36

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      9.98           99.89
     14.93           99.90
     14.96          100.00
0WINDSPEED    CUMULATIVE FREQUENCY
 (INTERPOLATED)
 (METER/SEC)        (PERCENT)
      0.10            0.29
      1.49           11.35
      2.99           53.17
      4.98           85.78
      7.48           98.17
      9.97           99.89
     14.96          100.00
0
0LOG-NORMAL INTERPOLATION PERCENTILES
0WINDSPEED    CUMULATIVE FREQUENCY
 (METER/SEC)        (PERCENT)
      0.21            1.00
      0.46            3.00
      0.70            5.00
      1.31           10.00
      1.64           15.00
      1.82           20.00
      1.99           25.00
      2.16           30.00
      2.33           35.00
      2.50           40.00
      2.68           45.00
      2.86           50.00
      3.06           55.00
      3.27           60.00
      3.50           65.00
      3.76           70.00
      4.06           75.00
      4.43           80.00
      5.00           85.00
      5.42           90.00
1USNRC COMPUTER CODE-PAVAN, VERSION 2.0          RUN DATE: Wed Apr 14 10:41:55 2004

/PLANT NAME: Palisades                           METEOROLOGICAL INSTRUMENTATION
 DATA PERIOD:  1999-2003                         WIND SENSORS HEIGHT: 10 Meters        DT
 TYPE OF RELEASE: Ground Level Release           DELTA-T HEIGHTS: from 10m to 60m
 SOURCE OF DATA: Data from onsite met tower
 COMMENTS: NONE
 PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145
0PARAMETER VALUES FOR THE CHI/Q CALCULATIONS FOR THE   S SECTOR.
 STABILITY WINDSPEED FREQUENCY DISTANCE TERRAIN HT EFF PLUME HT  SIGMA-Y SIGMA-Z MEANDER-SY  ** CHI/Q VALUES (SEC/CUBIC METER)
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CLASS	METER/SEC AT 10.0 METERS	PERCENT	METERS	METERS	METERS	METERS	METERS	METERS	MEANDER	BLDG WAKE CA=1006.SQ.METERS	USED
A	0.1	0.00	677.	0.	0.	131.7	215.2	131.7	1.126E-04	1.113E-04	1.113E-04
A	1.5	0.91	677.	0.	0.	131.7	215.2	131.7	7.507E-06	7.423E-06	7.423E-06
A	3.0	2.77	677.	0.	0.	131.7	215.2	131.7	3.753E-06	3.711E-06	3.711E-06
A	5.0	2.56	677.	0.	0.	131.7	215.2	131.7	2.252E-06	2.227E-06	2.227E-06
A	7.5	0.69	677.	0.	0.	131.7	215.2	131.7	1.501E-06	1.485E-06	1.485E-06
B	3.0	0.91	677.	0.	0.	99.0	71.6	99.0	1.500E-05	1.435E-05	1.435E-05
B	5.0	0.91	677.	0.	0.	99.0	71.6	99.0	9.000E-06	8.612E-06	8.612E-06
B	7.5	0.21	677.	0.	0.	99.0	71.6	99.0	6.000E-06	5.741E-06	5.741E-06
C	0.1	0.00	677.	0.	0.	75.2	42.8	75.2	9.907E-04	9.012E-04	9.012E-04
C	1.5	0.21	677.	0.	0.	75.2	42.8	75.2	6.605E-05	6.008E-05	6.008E-05
C	3.0	1.65	677.	0.	0.	75.2	42.8	75.2	3.302E-05	3.004E-05	3.004E-05
C	5.0	1.39	677.	0.	0.	75.2	42.8	75.2	1.981E-05	1.802E-05	1.802E-05
C	7.5	0.69	677.	0.	0.	75.2	42.8	75.2	1.321E-05	1.202E-05	1.202E-05
D	0.1	0.17	677.	0.	0.	53.0	23.3	105.9	1.291E-03	2.051E-03	1.291E-03
D	1.5	3.73	677.	0.	0.	53.0	23.3	105.9	8.608E-05	1.367E-04	8.608E-05
D	3.0	14.18	677.	0.	0.	53.0	23.3	82.1	5.550E-05	6.837E-05	5.550E-05
D	5.0	17.65	677.	0.	0.	53.0	23.3	59.5	4.596E-05	4.102E-05	4.102E-05
D	7.5	6.72	677.	0.	0.	53.0	23.3	53.0	3.443E-05	2.735E-05	2.735E-05
D	10.0	0.69	677.	0.	0.	53.0	23.3	53.0	2.582E-05	2.051E-05	2.051E-05
E	0.1	0.20	677.	0.	0.	37.7	16.2	113.0	1.746E-03	3.437E-03	1.746E-03
E	1.5	6.29	677.	0.	0.	37.7	16.2	113.0	1.164E-04	2.292E-04	1.164E-04
E	3.0	20.21	677.	0.	0.	37.7	16.2	75.7	8.688E-05	1.146E-04	8.688E-05
E	5.0	6.03	677.	0.	0.	37.7	16.2	45.4	8.688E-05	6.875E-05	6.875E-05
E	7.5	0.21	677.	0.	0.	37.7	16.2	37.7	6.985E-05	4.583E-05	4.583E-05
F	0.1	0.06	677.	0.	0.	26.0	10.3	104.0	2.975E-03	5.432E-03	2.975E-03
F	1.5	3.04	677.	0.	0.	26.0	10.3	104.0	1.983E-04	3.621E-04	1.983E-04
F	3.0	4.64	677.	0.	0.	26.0	10.3	62.7	1.644E-04	1.811E-04	1.644E-04
F	5.0	0.48	677.	0.	0.	26.0	10.3	32.9	1.879E-04	1.086E-04	1.086E-04
G	0.1	0.01	677.	0.	0.	17.9	6.6	107.6	4.504E-03	9.007E-03	4.504E-03
G	1.5	1.17	677.	0.	0.	17.9	6.6	107.6	3.003E-04	6.004E-04	3.003E-04
G	3.0	1.39	677.	0.	0.	17.9	6.6	56.0	2.885E-04	3.002E-04	2.885E-04
G	5.0	0.21	677.	0.	0.	17.9	6.6	24.4	3.982E-04	1.801E-04	1.801E-04

1USNRC COMPUTER CODE-PAVAN, VERSION 2.0 RUN DATE: Wed Apr 14 10:41:55 2004

/PLANT NAME: Palisades METEOROLOGICAL INSTRUMENTATION
DATA PERIOD: 1999-2003 WIND SENSORS HEIGHT: 10 Meters DT
TYPE OF RELEASE: Ground Level Release DELTA-T HEIGHTS: from 10m to 60m
SOURCE OF DATA: Data from onsite met tower

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 COMMENTS: NONE
 PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145
0SITE EXCLUSION BOUNDARY CALCULATIONS:
0   S SECTOR     BOUNDARY DISTANCE =  677.0 METERS
0LATERAL PLUME MEANDER/BUILDING WAKE CREDIT ALLOWED
 AS A FUNCTION OF DOWNWIND DISTANCE.
 MEANDER CREDIT IS FOR WINDSPEEDS LESS THAN 6 MPS.
 BUILDING WAKE CREDIT ALLOWED:   C=  0.5     A=  2011.     D=   58.5
 CORRECTION FACTORS USED IN THE ANNUAL AVERAGE CALCULATIONS.
0BELOW ARE PRINTED THE ORDERED VALUES OF CHI/Q AND THE FREQUENCY WITH WHICH THAT VALUE IS REACHED OR EXCEEDED.
 THE TOP NUMBER IS THE CHI/Q.  THE MIDDLE NUMBER IS THE FREQUENCY NORMALIZED TO THIS SECTOR.
 THE THIRD NUMBER IS THE FREQUENCY WITH RESPECT TO ALL TIME.
0   4.504E-03   2.975E-03   1.746E-03   1.291E-03   9.012E-04   3.003E-04   2.885E-04   1.983E-04   1.801E-04   1.644E-04
        0.011       0.070       0.265       0.434       0.437       1.610       2.997       6.036       6.250      10.889
      0.00047     0.00301     0.01142     0.01869     0.01882     0.06934     0.12904     0.25992     0.26911     0.46888
0   1.164E-04   1.113E-04   1.086E-04   8.688E-05   8.608E-05   6.875E-05   6.008E-05   5.550E-05   4.583E-05   4.102E-05
       17.181      17.185      17.665      37.875      41.608      47.634      47.847      62.032      62.245      79.896
      0.73983     0.73998     0.76065     1.63091     1.79165     2.05112     2.06030     2.67110     2.68028     3.44033
0   3.004E-05   2.735E-05   2.051E-05   1.802E-05   1.435E-05   1.202E-05   8.612E-06   7.423E-06   5.741E-06   3.711E-06
       81.549      88.268      88.962      90.348      91.255      91.948      92.854      93.761      93.974      96.747
      3.51151     3.80083     3.83068     3.89039     3.92942     3.95927     3.99831     4.03734     4.04653     4.16593
0   2.227E-06   1.485E-06
       99.307     100.000
      4.27615     4.30600
0          X/Q PERCENTILES
 (BASED ON THE UPPER ENVELOPE OF THE
 ORDERED X/Q-FREQUENCY VALUES, AND AS
 PLOTTED ON A LOG-NORMAL GRAPH.)
0 PERCENT OF TIME CHI/Q IS EQUALED OR EXCEEDED
        CHI/Q      WITH RESPECT TO     WHEN THE WIND BLOWS
 SEC/CUBIC METER  THE TOTAL TIME      INTO THIS SECTOR ONLY

                                                          HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 3)=   0.011
                                                          HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 4)=   0.739
                                                          HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 6)=   2.668
                                                          HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 7)=   3.437
     8.119E-04              0.043              1.000
     4.064E-04              0.129              3.000
     2.881E-04              0.215              5.000
     1.757E-04              0.431             10.000
     1.294E-04              0.646             15.000
     1.108E-04              0.861             20.000
     1.029E-04              1.076             25.000
     9.665E-05              1.292             30.000
     9.158E-05              1.507             35.000
     8.732E-05              1.722             40.000
     7.914E-05              1.938             45.000
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     7.058E-05              2.153             50.000
     6.353E-05              2.368             55.000
     5.763E-05              2.584             60.000
     5.254E-05              2.799             65.000
     4.812E-05              3.014             70.000
     4.430E-05              3.229             75.000
0    1.572E-04              0.5               11.61
0ANNUAL AVERAGE =   1.07E-05
1USNRC COMPUTER CODE-PAVAN, VERSION 2.0          RUN DATE: Wed Apr 14 10:41:55 2004

/PLANT NAME: Palisades                           METEOROLOGICAL INSTRUMENTATION
 DATA PERIOD:  1999-2003                         WIND SENSORS HEIGHT: 10 Meters       DT
 TYPE OF RELEASE: Ground Level Release           DELTA-T HEIGHTS: from 10m to 60m
 SOURCE OF DATA: Data from onsite met tower
 COMMENTS: NONE
 PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145
0PARAMETER VALUES FOR THE CHI/Q CALCULATIONS FOR THE SSW SECTOR.
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STABILITY CLASS	WINDSPEED FREQUENCY AT 10.0 METERS METER/SEC	PERCENT	DISTANCE METERS	TERRAIN HT METERS	EFF PLUME HT METERS	SIGMA-Y METERS	SIGMA-Z METERS	MEANDER-SY METERS	** CHI/Q VALUES (SEC/CUBIC METER) MEANDER	BLDG WAKE CA=1006.SQ.METERS	USED
A	0.1	0.01	677.	0.	0.	131.7	215.2	131.7	1.126E-04	1.113E-04	1.113E-04
A	1.5	1.33	677.	0.	0.	131.7	215.2	131.7	7.507E-06	7.423E-06	7.423E-06
A	3.0	3.77	677.	0.	0.	131.7	215.2	131.7	3.753E-06	3.711E-06	3.711E-06
A	5.0	2.43	677.	0.	0.	131.7	215.2	131.7	2.252E-06	2.227E-06	2.227E-06
B	3.0	1.02	677.	0.	0.	99.0	71.6	99.0	1.500E-05	1.435E-05	1.435E-05
B	5.0	0.71	677.	0.	0.	99.0	71.6	99.0	9.000E-06	8.612E-06	8.612E-06
C	0.1	0.01	677.	0.	0.	75.2	42.8	75.2	9.907E-04	9.012E-04	9.012E-04
C	1.5	0.71	677.	0.	0.	75.2	42.8	75.2	6.605E-05	6.008E-05	6.008E-05
C	3.0	1.73	677.	0.	0.	75.2	42.8	75.2	3.302E-05	3.004E-05	3.004E-05
C	5.0	1.02	677.	0.	0.	75.2	42.8	75.2	1.981E-05	1.802E-05	1.802E-05
C	7.5	0.31	677.	0.	0.	75.2	42.8	75.2	1.321E-05	1.202E-05	1.202E-05
D	0.1	0.22	677.	0.	0.	53.0	23.3	105.9	1.291E-03	2.051E-03	1.291E-03
D	1.5	4.79	677.	0.	0.	53.0	23.3	105.9	8.608E-05	1.367E-04	8.608E-05
D	3.0	16.79	677.	0.	0.	53.0	23.3	82.1	5.550E-05	6.837E-05	5.550E-05
D	5.0	14.36	677.	0.	0.	53.0	23.3	59.5	4.596E-05	4.102E-05	4.102E-05
D	7.5	1.73	677.	0.	0.	53.0	23.3	53.0	3.443E-05	2.735E-05	2.735E-05
E	0.1	0.21	677.	0.	0.	37.7	16.2	113.0	1.746E-03	3.437E-03	1.746E-03
E	1.5	6.83	677.	0.	0.	37.7	16.2	113.0	1.164E-04	2.292E-04	1.164E-04
E	3.0	20.16	677.	0.	0.	37.7	16.2	75.7	8.688E-05	1.146E-04	8.688E-05
E	5.0	5.49	677.	0.	0.	37.7	16.2	45.4	8.688E-05	6.875E-05	6.875E-05
F	0.1	0.06	677.	0.	0.	26.0	10.3	104.0	2.975E-03	5.432E-03	2.975E-03

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    F         1.5       3.06      677.        0.          0.        26.0    10.3    104.0      1.983E-04   3.621E-04   1.983E-04
    F         3.0       8.87      677.        0.          0.        26.0    10.3     62.7      1.644E-04   1.811E-04   1.644E-04
    F         5.0       0.31      677.        0.          0.        26.0    10.3     32.9      1.879E-04   1.086E-04   1.086E-04

    G         0.1       0.01      677.        0.          0.        17.9     6.6    107.6      4.504E-03   9.007E-03   4.504E-03
    G         1.5       1.33      677.        0.          0.        17.9     6.6    107.6      3.003E-04   6.004E-04   3.003E-04
    G         3.0       2.43      677.        0.          0.        17.9     6.6     56.0      2.885E-04   3.002E-04   2.885E-04
    G         5.0       0.31      677.        0.          0.        17.9     6.6     24.4      3.982E-04   1.801E-04   1.801E-04
1USNRC COMPUTER CODE-PAVAN, VERSION 2.0          RUN DATE: Wed Apr 14 10:41:55 2004

/PLANT NAME: Palisades                           METEOROLOGICAL INSTRUMENTATION
 DATA PERIOD:  1999-2003                         WIND SENSORS HEIGHT: 10 Meters        DT
 TYPE OF RELEASE: Ground Level Release           DELTA-T HEIGHTS: from 10m to 60m
 SOURCE OF DATA: Data from onsite met tower
 COMMENTS: NONE
 PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145
0SITE EXCLUSION BOUNDARY CALCULATIONS:
0 SSW SECTOR     BOUNDARY DISTANCE =  677.0 METERS
0LATERAL PLUME MEANDER/BUILDING WAKE CREDIT ALLOWED
 AS A FUNCTION OF DOWNWIND DISTANCE.
 MEANDER CREDIT IS FOR WINDSPEEDS LESS THAN 6 MPS.
 BUILDING WAKE CREDIT ALLOWED:   C=  0.5     A=  2011.     D=   58.5
 CORRECTION FACTORS USED IN THE ANNUAL AVERAGE CALCULATIONS.
0BELOW ARE PRINTED THE ORDERED VALUES OF CHI/Q AND THE FREQUENCY WITH WHICH THAT VALUE IS REACHED OR EXCEEDED.
 THE TOP NUMBER IS THE CHI/Q.  THE MIDDLE NUMBER IS THE FREQUENCY NORMALIZED TO THIS SECTOR.
 THE THIRD NUMBER IS THE FREQUENCY WITH RESPECT TO ALL TIME.
0   4.504E-03   2.975E-03   1.746E-03   1.291E-03   9.012E-04   3.003E-04   2.885E-04   1.983E-04   1.801E-04   1.644E-04
        0.012       0.072       0.284       0.500       0.510       1.844       4.276       7.336       7.650      16.516
      0.00036     0.00210     0.00830     0.01464     0.01494     0.05397     0.12515     0.21471     0.22389     0.48336
0   1.164E-04   1.113E-04   1.086E-04   8.688E-05   8.608E-05   6.875E-05   6.008E-05   5.550E-05   4.102E-05   3.004E-05
       23.342      23.347      23.661      43.824      48.610      54.102      54.808      71.598      85.956      87.682
      0.68313     0.68328     0.69247     1.28259     1.42266     1.58340     1.60406     2.09545     2.51566     2.56618
0   2.735E-05   1.802E-05   1.435E-05   1.202E-05   8.612E-06   7.423E-06   3.711E-06   2.227E-06
       89.408      90.428      91.448      91.762      92.468      93.802      97.568     100.000
      2.61669     2.64654     2.67639     2.68558     2.70625     2.74528     2.85550     2.92668
0          X/Q PERCENTILES
 (BASED ON THE UPPER ENVELOPE OF THE
 ORDERED X/Q-FREQUENCY VALUES, AND AS
 PLOTTED ON A LOG-NORMAL GRAPH.)
0 PERCENT OF TIME CHI/Q IS EQUALED OR EXCEEDED
        CHI/Q      WITH RESPECT TO     WHEN THE WIND BLOWS
 SEC/CUBIC METER  THE TOTAL TIME      INTO THIS SECTOR ONLY

                                                    HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 2)=   0.002
                                                    HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 3)=   0.008
                                                    HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 4)=   0.483
                                                    HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 5)=   1.421
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HANDCHECK GRAPH: SLOPE LT -1.0 FOR LOW PERCENTAGES. XSAVE(6)= 2.093

9.055E-04	0.029	1.000
4.866E-04	0.088	3.000
3.578E-04	0.146	5.000
2.304E-04	0.293	10.000
1.756E-04	0.439	15.000
1.474E-04	0.585	20.000
1.295E-04	0.732	25.000
1.162E-04	0.878	30.000
1.058E-04	1.024	35.000
9.738E-05	1.171	40.000
9.042E-05	1.317	45.000
8.344E-05	1.463	50.000
7.504E-05	1.610	55.000
6.802E-05	1.756	60.000
6.208E-05	1.902	65.000
5.698E-05	2.049	70.000
0 1.613E-04	0.5	17.08

0ANNUAL AVERAGE = 8.20E-06

1USNRC COMPUTER CODE-PAVAN, VERSION 2.0 RUN DATE: Wed Apr 14 10:41:55 2004

/PLANT NAME: Palisades METEOROLOGICAL INSTRUMENTATION
DATA PERIOD: 1999-2003 WIND SENSORS HEIGHT: 10 Meters DT
TYPE OF RELEASE: Ground Level Release DELTA-T HEIGHTS: from 10m to 60m
SOURCE OF DATA: Data from onsite met tower
COMMENTS: NONE
PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145

0PARAMETER VALUES FOR THE CHI/Q CALCULATIONS FOR THE SW SECTOR.

STABILITY CLASS	WINDSPEED AT 10.0 METERS METER/SEC	FREQUENCY PERCENT	DISTANCE METERS	TERRAIN HT METERS	EFF PLUME HT METERS	SIGMA-Y METERS	SIGMA-Z METERS	MEANDER-SY METERS	** CHI/Q VALUES (SEC/CUBIC METER) MEANDER	BLDG WAKE CA=1006.SQ.METERS	USED
A	0.1	0.00	677.	0.	0.	131.7	215.2	131.7	1.126E-04	1.113E-04	1.113E-04
A	1.5	0.67	677.	0.	0.	131.7	215.2	131.7	7.507E-06	7.423E-06	7.423E-06
A	3.0	5.79	677.	0.	0.	131.7	215.2	131.7	3.753E-06	3.711E-06	3.711E-06
A	5.0	2.89	677.	0.	0.	131.7	215.2	131.7	2.252E-06	2.227E-06	2.227E-06
A	7.5	0.67	677.	0.	0.	131.7	215.2	131.7	1.501E-06	1.485E-06	1.485E-06
B	3.0	0.96	677.	0.	0.	99.0	71.6	99.0	1.500E-05	1.435E-05	1.435E-05
B	5.0	1.26	677.	0.	0.	99.0	71.6	99.0	9.000E-06	8.612E-06	8.612E-06
B	7.5	0.30	677.	0.	0.	99.0	71.6	99.0	6.000E-06	5.741E-06	5.741E-06
C	0.1	0.01	677.	0.	0.	75.2	42.8	75.2	9.907E-04	9.012E-04	9.012E-04
C	1.5	0.67	677.	0.	0.	75.2	42.8	75.2	6.605E-05	6.008E-05	6.008E-05
C	3.0	1.26	677.	0.	0.	75.2	42.8	75.2	3.302E-05	3.004E-05	3.004E-05
C	5.0	1.26	677.	0.	0.	75.2	42.8	75.2	1.981E-05	1.802E-05	1.802E-05
C	7.5	0.30	677.	0.	0.	75.2	42.8	75.2	1.321E-05	1.202E-05	1.202E-05

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    D         0.1       0.25      677.        0.          0.        53.0    23.3    105.9      1.291E-03   2.051E-03   1.291E-03
    D         1.5       5.49      677.        0.          0.        53.0    23.3    105.9      8.608E-05   1.367E-04   8.608E-05
    D         3.0      17.15      677.        0.          0.        53.0    23.3     82.1      5.550E-05   6.837E-05   5.550E-05
    D         5.0      10.99      677.        0.          0.        53.0    23.3     59.5      4.596E-05   4.102E-05   4.102E-05
    D         7.5       3.27      677.        0.          0.        53.0    23.3     53.0      3.443E-05   2.735E-05   2.735E-05

    E         0.1       0.19      677.        0.          0.        37.7    16.2    113.0      1.746E-03   3.437E-03   1.746E-03
    E         1.5       6.16      677.        0.          0.        37.7    16.2    113.0      1.164E-04   2.292E-04   1.164E-04
    E         3.0      15.51      677.        0.          0.        37.7    16.2     75.7      8.688E-05   1.146E-04   8.688E-05
    E         5.0       2.89      677.        0.          0.        37.7    16.2     45.4      8.688E-05   6.875E-05   6.875E-05
    E         7.5       0.67      677.        0.          0.        37.7    16.2     37.7      6.985E-05   4.583E-05   4.583E-05

    F         0.1       0.07      677.        0.          0.        26.0    10.3    104.0      2.975E-03   5.432E-03   2.975E-03
    F         1.5       3.86      677.        0.          0.        26.0    10.3    104.0      1.983E-04   3.621E-04   1.983E-04
    F         3.0      10.02      677.        0.          0.        26.0    10.3     62.7      1.644E-04   1.811E-04   1.644E-04
    F         5.0       0.67      677.        0.          0.        26.0    10.3     32.9      1.879E-04   1.086E-04   1.086E-04

    G         0.1       0.01      677.        0.          0.        17.9     6.6    107.6      4.504E-03   9.007E-03   4.504E-03
    G         1.5       0.96      677.        0.          0.        17.9     6.6    107.6      3.003E-04   6.004E-04   3.003E-04
    G         3.0       5.49      677.        0.          0.        17.9     6.6     56.0      2.885E-04   3.002E-04   2.885E-04
    G         5.0       0.30      677.        0.          0.        17.9     6.6     24.4      3.982E-04   1.801E-04   1.801E-04
1USNRC COMPUTER CODE-PAVAN, VERSION 2.0          RUN DATE: Wed Apr 14 10:41:55 2004

/PLANT NAME: Palisades                           METEOROLOGICAL INSTRUMENTATION
 DATA PERIOD:  1999-2003                         WIND SENSORS HEIGHT: 10 Meters        DT
 TYPE OF RELEASE: Ground Level Release           DELTA-T HEIGHTS: from 10m to 60m
 SOURCE OF DATA: Data from onsite met tower
 COMMENTS: NONE
 PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145
0SITE EXCLUSION BOUNDARY CALCULATIONS:
0  SW SECTOR     BOUNDARY DISTANCE =  677.0 METERS
0LATERAL PLUME MEANDER/BUILDING WAKE CREDIT ALLOWED
 AS A FUNCTION OF DOWNWIND DISTANCE.
 MEANDER CREDIT IS FOR WINDSPEEDS LESS THAN 6 MPS.
 BUILDING WAKE CREDIT ALLOWED:   C=  0.5     A=  2011.     D=   58.5
 CORRECTION FACTORS USED IN THE ANNUAL AVERAGE CALCULATIONS.
0BELOW ARE PRINTED THE ORDERED VALUES OF CHI/Q AND THE FREQUENCY WITH WHICH THAT VALUE IS REACHED OR EXCEEDED.
 THE TOP NUMBER IS THE CHI/Q.  THE MIDDLE NUMBER IS THE FREQUENCY NORMALIZED TO THIS SECTOR.
 THE THIRD NUMBER IS THE FREQUENCY WITH RESPECT TO ALL TIME.
0   4.504E-03   2.975E-03   1.746E-03   1.291E-03   9.012E-04   3.003E-04   2.885E-04   1.983E-04   1.801E-04   1.644E-04
        0.009       0.084       0.275       0.524       0.533       1.498       6.991      10.851      11.148      21.168
      0.00028     0.00259     0.00851     0.01620     0.01649     0.04635     0.21627     0.33567     0.34485     0.65484
0   1.164E-04   1.113E-04   1.086E-04   8.688E-05   8.608E-05   6.875E-05   6.008E-05   5.550E-05   4.583E-05   4.102E-05
       27.329      27.332      28.000      43.513      49.006      51.901      52.569      69.715      70.383      81.369
      0.84543     0.84551     0.86617     1.34608     1.51600     1.60555     1.62622     2.15664     2.17731     2.51715
0   3.004E-05   2.735E-05   1.802E-05   1.435E-05   1.202E-05   8.612E-06   7.423E-06   5.741E-06   3.711E-06   2.227E-06
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       82.631      85.897      87.159      88.124      88.421      89.682      90.350      90.647      96.437      99.332
      2.55618     2.65722     2.69625     2.72610     2.73529     2.77432     2.79499     2.80417     2.98328     3.07283
0   1.485E-06
      100.000
      3.09350
0          X/Q PERCENTILES
 (BASED ON THE UPPER ENVELOPE OF THE
 ORDERED X/Q-FREQUENCY VALUES, AND AS
 PLOTTED ON A LOG-NORMAL GRAPH.)
0 PERCENT OF TIME CHI/Q IS EQUALED OR EXCEEDED
        CHI/Q      WITH RESPECT TO     WHEN THE WIND BLOWS
 SEC/CUBIC METER  THE TOTAL TIME      INTO THIS SECTOR ONLY

                                                    HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 3)=   0.016
                                                    HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 4)=   0.654
                                                    HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 5)=   1.514
                                                    HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 6)=   2.154
                                                    HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 7)=   2.515
     9.391E-04              0.031              1.000
     5.284E-04              0.093              3.000
     3.973E-04              0.155              5.000
     2.642E-04              0.309             10.000
     2.054E-04              0.464             15.000
     1.706E-04              0.619             20.000
     1.454E-04              0.773             25.000
     1.267E-04              0.928             30.000
     1.125E-04              1.083             35.000
     1.013E-04              1.237             40.000
     9.223E-05              1.392             45.000
     8.401E-05              1.547             50.000
     7.475E-05              1.701             55.000
     6.709E-05              1.856             60.000
     6.067E-05              2.011             65.000
     5.507E-05              2.165             70.000
     4.816E-05              2.320             75.000
     4.242E-05              2.475             80.000
0    1.958E-04              0.5               16.16
0ANNUAL AVERAGE =   8.94E-06
1USNRC COMPUTER CODE-PAVAN, VERSION 2.0          RUN DATE: Wed Apr 14 10:41:55 2004

/PLANT NAME: Palisades                           METEOROLOGICAL INSTRUMENTATION
 DATA PERIOD:  1999-2003                         WIND SENSORS HEIGHT: 10 Meters        DT
 TYPE OF RELEASE: Ground Level Release           DELTA-T HEIGHTS: from 10m to 60m
 SOURCE OF DATA: Data from onsite met tower
 COMMENTS: NONE
 PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145
0PARAMETER VALUES FOR THE CHI/Q CALCULATIONS FOR THE WSW SECTOR.
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STABILITY CLASS	WINDSPEED METER/SEC AT 10.0 METERS	FREQUENCY PERCENT	DISTANCE METERS	TERRAIN HT METERS	EFF PLUME HT METERS	SIGMA-Y METERS	SIGMA-Z METERS	MEANDER-SY METERS	** CHI/Q VALUES (SEC/CUBIC METER) MEANDER	BLDG WAKE CA=1006.SQ.METERS	USED
A	0.1	0.00	677.	0.	0.	131.7	215.2	131.7	1.126E-04	1.113E-04	1.113E-04
A	1.5	1.17	677.	0.	0.	131.7	215.2	131.7	7.507E-06	7.423E-06	7.423E-06
A	3.0	3.94	677.	0.	0.	131.7	215.2	131.7	3.753E-06	3.711E-06	3.711E-06
A	5.0	2.14	677.	0.	0.	131.7	215.2	131.7	2.252E-06	2.227E-06	2.227E-06
A	7.5	0.62	677.	0.	0.	131.7	215.2	131.7	1.501E-06	1.485E-06	1.485E-06
B	3.0	0.62	677.	0.	0.	99.0	71.6	99.0	1.500E-05	1.435E-05	1.435E-05
B	5.0	1.17	677.	0.	0.	99.0	71.6	99.0	9.000E-06	8.612E-06	8.612E-06
B	7.5	0.28	677.	0.	0.	99.0	71.6	99.0	6.000E-06	5.741E-06	5.741E-06
C	0.1	0.00	677.	0.	0.	75.2	42.8	75.2	9.907E-04	9.012E-04	9.012E-04
C	1.5	0.28	677.	0.	0.	75.2	42.8	75.2	6.605E-05	6.008E-05	6.008E-05
C	3.0	0.90	677.	0.	0.	75.2	42.8	75.2	3.302E-05	3.004E-05	3.004E-05
C	5.0	0.90	677.	0.	0.	75.2	42.8	75.2	1.981E-05	1.802E-05	1.802E-05
C	7.5	0.62	677.	0.	0.	75.2	42.8	75.2	1.321E-05	1.202E-05	1.202E-05
D	0.1	0.22	677.	0.	0.	53.0	23.3	105.9	1.291E-03	2.051E-03	1.291E-03
D	1.5	4.83	677.	0.	0.	53.0	23.3	105.9	8.608E-05	1.367E-04	8.608E-05
D	3.0	13.26	677.	0.	0.	53.0	23.3	82.1	5.550E-05	6.837E-05	5.550E-05
D	5.0	14.43	677.	0.	0.	53.0	23.3	59.5	4.596E-05	4.102E-05	4.102E-05
D	7.5	7.53	677.	0.	0.	53.0	23.3	53.0	3.443E-05	2.735E-05	2.735E-05
E	0.1	0.14	677.	0.	0.	37.7	16.2	113.0	1.746E-03	3.437E-03	1.746E-03
E	1.5	4.49	677.	0.	0.	37.7	16.2	113.0	1.164E-04	2.292E-04	1.164E-04
E	3.0	12.63	677.	0.	0.	37.7	16.2	75.7	8.688E-05	1.146E-04	8.688E-05
E	5.0	3.94	677.	0.	0.	37.7	16.2	45.4	8.688E-05	6.875E-05	6.875E-05
E	7.5	0.90	677.	0.	0.	37.7	16.2	37.7	6.985E-05	4.583E-05	4.583E-05
F	0.1	0.06	677.	0.	0.	26.0	10.3	104.0	2.975E-03	5.432E-03	2.975E-03
F	1.5	3.04	677.	0.	0.	26.0	10.3	104.0	1.983E-04	3.621E-04	1.983E-04
F	3.0	8.70	677.	0.	0.	26.0	10.3	62.7	1.644E-04	1.811E-04	1.644E-04
F	5.0	1.17	677.	0.	0.	26.0	10.3	32.9	1.879E-04	1.086E-04	1.086E-04
G	0.1	0.02	677.	0.	0.	17.9	6.6	107.6	4.504E-03	9.007E-03	4.504E-03
G	1.5	1.80	677.	0.	0.	17.9	6.6	107.6	3.003E-04	6.004E-04	3.003E-04
G	3.0	9.32	677.	0.	0.	17.9	6.6	56.0	2.885E-04	3.002E-04	2.885E-04
G	5.0	0.90	677.	0.	0.	17.9	6.6	24.4	3.982E-04	1.801E-04	1.801E-04

1USNRC COMPUTER CODE-PAVAN, VERSION 2.0 RUN DATE: Wed Apr 14 10:41:55 2004

/PLANT NAME: Palisades METEOROLOGICAL INSTRUMENTATION
DATA PERIOD: 1999-2003 WIND SENSORS HEIGHT: 10 Meters DT
TYPE OF RELEASE: Ground Level Release DELTA-T HEIGHTS: from 10m to 60m
SOURCE OF DATA: Data from onsite met tower

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 COMMENTS: NONE
 PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145
0SITE EXCLUSION BOUNDARY CALCULATIONS:
0 WSW SECTOR     BOUNDARY DISTANCE =  677.0 METERS
0LATERAL PLUME MEANDER/BUILDING WAKE CREDIT ALLOWED
 AS A FUNCTION OF DOWNWIND DISTANCE.
 MEANDER CREDIT IS FOR WINDSPEEDS LESS THAN 6 MPS.
 BUILDING WAKE CREDIT ALLOWED:   C=  0.5     A=  2011.     D=   58.5
 CORRECTION FACTORS USED IN THE ANNUAL AVERAGE CALCULATIONS.
0BELOW ARE PRINTED THE ORDERED VALUES OF CHI/Q AND THE FREQUENCY WITH WHICH THAT VALUE IS REACHED OR EXCEEDED.
 THE TOP NUMBER IS THE CHI/Q.  THE MIDDLE NUMBER IS THE FREQUENCY NORMALIZED TO THIS SECTOR.
 THE THIRD NUMBER IS THE FREQUENCY WITH RESPECT TO ALL TIME.
0   4.504E-03   2.975E-03   1.746E-03   1.291E-03   9.012E-04   3.003E-04   2.885E-04   1.983E-04   1.801E-04   1.644E-04
        0.017       0.076       0.215       0.433       0.437       2.233      11.553      14.591      15.489      24.188
      0.00055     0.00251     0.00715     0.01442     0.01455     0.07425     0.38424     0.48527     0.51512     0.80445
0   1.164E-04   1.113E-04   1.086E-04   8.688E-05   8.608E-05   6.875E-05   6.008E-05   5.550E-05   4.583E-05   4.102E-05
       28.675      28.680      29.854      42.488      47.321      51.257      51.533      64.789      65.686      80.116
      0.95370     0.95385     0.99289     1.41309     1.57383     1.70471     1.71390     2.15477     2.18462     2.66453
0   3.004E-05   2.735E-05   1.802E-05   1.435E-05   1.202E-05   8.612E-06   7.423E-06   5.741E-06   3.711E-06   2.227E-06
       81.014      88.539      89.437      90.058      90.679      91.853      93.027      93.303      97.238      99.379
      2.69438     2.94466     2.97452     2.99518     3.01585     3.05488     3.09392     3.10310     3.23399     3.30517
0   1.485E-06
      100.000
      3.32584
0          X/Q PERCENTILES
 (BASED ON THE UPPER ENVELOPE OF THE
 ORDERED X/Q-FREQUENCY VALUES, AND AS
 PLOTTED ON A LOG-NORMAL GRAPH.)
0 PERCENT OF TIME CHI/Q IS EQUALED OR EXCEEDED
        CHI/Q      WITH RESPECT TO     WHEN THE WIND BLOWS
 SEC/CUBIC METER  THE TOTAL TIME      INTO THIS SECTOR ONLY

                                                                HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 2)=   0.003
                                                                HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 3)=   0.384
                                                                HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 4)=   0.803
                                                                HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 5)=   1.572
                                                                HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 6)=   2.662
                                                                HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 7)=   2.942
     9.965E-04              0.033              1.000
     5.894E-04              0.100              3.000
     4.543E-04              0.166              5.000
     3.128E-04              0.333             10.000
     2.377E-04              0.499             15.000
     1.908E-04              0.665             20.000
     1.594E-04              0.831             25.000
     1.344E-04              0.998             30.000
     1.159E-04              1.164             35.000
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     1.018E-04              1.330             40.000
     9.054E-05              1.497             45.000
     7.988E-05              1.663             50.000
     7.008E-05              1.829             55.000
     6.208E-05              1.996             60.000
     5.546E-05              2.162             65.000
     4.990E-05              2.328             70.000
     4.517E-05              2.494             75.000
     4.111E-05              2.661             80.000
     3.230E-05              2.827             85.000
0    2.373E-04              0.5               15.03
0ANNUAL AVERAGE =   9.41E-06
1USNRC COMPUTER CODE-PAVAN, VERSION 2.0          RUN DATE: Wed Apr 14 10:41:55 2004

/PLANT NAME: Palisades                           METEOROLOGICAL INSTRUMENTATION
 DATA PERIOD:  1999-2003                         WIND SENSORS HEIGHT: 10 Meters       DT
 TYPE OF RELEASE: Ground Level Release           DELTA-T HEIGHTS: from 10m to 60m
 SOURCE OF DATA: Data from onsite met tower
 COMMENTS: NONE
 PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145
0PARAMETER VALUES FOR THE CHI/Q CALCULATIONS FOR THE   W SECTOR.
 STABILITY WINDSPEED FREQUENCY DISTANCE TERRAIN HT EFF PLUME HT  SIGMA-Y SIGMA-Z MEANDER-SY  ** CHI/Q VALUES (SEC/CUBIC METER)
   CLASS   METER/SEC  PERCENT   METERS    METERS      METERS      METERS  METERS   METERS        MEANDER   BLDG WAKE        USED
         AT  10.0 METERS                                                                                  CA=1006.SQ.METERS

    A         0.1       0.00      677.        0.          0.       131.7   215.2    131.7      1.126E-04   1.113E-04   1.113E-04
    A         1.5       0.48      677.        0.          0.       131.7   215.2    131.7      7.507E-06   7.423E-06   7.423E-06
    A         3.0       3.05      677.        0.          0.       131.7   215.2    131.7      3.753E-06   3.711E-06   3.711E-06
    A         5.0       3.26      677.        0.          0.       131.7   215.2    131.7      2.252E-06   2.227E-06   2.227E-06
    A         7.5       0.69      677.        0.          0.       131.7   215.2    131.7      1.501E-06   1.485E-06   1.485E-06
    A        10.0       0.21      677.        0.          0.       131.7   215.2    131.7      1.126E-06   1.113E-06   1.113E-06

    B         0.1       0.00      677.        0.          0.        99.0    71.6     99.0      4.500E-04   4.306E-04   4.306E-04
    B         1.5       0.21      677.        0.          0.        99.0    71.6     99.0      3.000E-05   2.871E-05   2.871E-05
    B         3.0       0.48      677.        0.          0.        99.0    71.6     99.0      1.500E-05   1.435E-05   1.435E-05
    B         5.0       0.91      677.        0.          0.        99.0    71.6     99.0      9.000E-06   8.612E-06   8.612E-06
    B         7.5       0.48      677.        0.          0.        99.0    71.6     99.0      6.000E-06   5.741E-06   5.741E-06
    B        10.0       0.21      677.        0.          0.        99.0    71.6     99.0      4.500E-06   4.306E-06   4.306E-06

    C         3.0       0.69      677.        0.          0.        75.2    42.8     75.2      3.302E-05   3.004E-05   3.004E-05
    C         5.0       1.66      677.        0.          0.        75.2    42.8     75.2      1.981E-05   1.802E-05   1.802E-05
    C         7.5       0.69      677.        0.          0.        75.2    42.8     75.2      1.321E-05   1.202E-05   1.202E-05

    D         0.1       0.14      677.        0.          0.        53.0    23.3    105.9      1.291E-03   2.051E-03   1.291E-03
    D         1.5       3.05      677.        0.          0.        53.0    23.3    105.9      8.608E-05   1.367E-04   8.608E-05
    D         3.0       9.78      677.        0.          0.        53.0    23.3     82.1      5.550E-05   6.837E-05   5.550E-05
    D         5.0      14.21      677.        0.          0.        53.0    23.3     59.5      4.596E-05   4.102E-05   4.102E-05
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    D         7.5       7.91      677.        0.          0.        53.0    23.3     53.0      3.443E-05   2.735E-05   2.735E-05
    D        10.0       1.39      677.        0.          0.        53.0    23.3     53.0      2.582E-05   2.051E-05   2.051E-05

    E         0.1       0.10      677.        0.          0.        37.7    16.2    113.0      1.746E-03   3.437E-03   1.746E-03
    E         1.5       3.26      677.        0.          0.        37.7    16.2    113.0      1.164E-04   2.292E-04   1.164E-04
    E         3.0      10.47      677.        0.          0.        37.7    16.2     75.7      8.688E-05   1.146E-04   8.688E-05
    E         5.0       8.17      677.        0.          0.        37.7    16.2     45.4      8.688E-05   6.875E-05   6.875E-05
    E         7.5       1.66      677.        0.          0.        37.7    16.2     37.7      6.985E-05   4.583E-05   4.583E-05
    E        10.0       0.48      677.        0.          0.        37.7    16.2     37.7      5.239E-05   3.437E-05   3.437E-05

    F         0.1       0.05      677.        0.          0.        26.0    10.3    104.0      2.975E-03   5.432E-03   2.975E-03
    F         1.5       2.78      677.        0.          0.        26.0    10.3    104.0      1.983E-04   3.621E-04   1.983E-04
    F         3.0       9.56      677.        0.          0.        26.0    10.3     62.7      1.644E-04   1.811E-04   1.644E-04
    F         5.0       1.87      677.        0.          0.        26.0    10.3     32.9      1.879E-04   1.086E-04   1.086E-04
    F        10.0       0.21      677.        0.          0.        26.0    10.3     26.0      1.190E-04   5.432E-05   5.432E-05

    G         0.1       0.02      677.        0.          0.        17.9     6.6    107.6      4.504E-03   9.007E-03   4.504E-03
    G         1.5       1.87      677.        0.          0.        17.9     6.6    107.6      3.003E-04   6.004E-04   3.003E-04
    G         3.0       9.08      677.        0.          0.        17.9     6.6     56.0      2.885E-04   3.002E-04   2.885E-04
    G         5.0       0.91      677.        0.          0.        17.9     6.6     24.4      3.982E-04   1.801E-04   1.801E-04
1USNRC COMPUTER CODE-PAVAN, VERSION 2.0          RUN DATE: Wed Apr 14 10:41:55 2004

/PLANT NAME: Palisades                           METEOROLOGICAL INSTRUMENTATION
 DATA PERIOD:  1999-2003                         WIND SENSORS HEIGHT: 10 Meters        DT
 TYPE OF RELEASE: Ground Level Release           DELTA-T HEIGHTS: from 10m to 60m
 SOURCE OF DATA: Data from onsite met tower
 COMMENTS: NONE
 PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145
0SITE EXCLUSION BOUNDARY CALCULATIONS:
0   W SECTOR     BOUNDARY DISTANCE =  677.0 METERS
0LATERAL PLUME MEANDER/BUILDING WAKE CREDIT ALLOWED
 AS A FUNCTION OF DOWNWIND DISTANCE.
 MEANDER CREDIT IS FOR WINDSPEEDS LESS THAN 6 MPS.
 BUILDING WAKE CREDIT ALLOWED:   C=  0.5     A=  2011.     D=   58.5
 CORRECTION FACTORS USED IN THE ANNUAL AVERAGE CALCULATIONS.
0BELOW ARE PRINTED THE ORDERED VALUES OF CHI/Q AND THE FREQUENCY WITH WHICH THAT VALUE IS REACHED OR EXCEEDED.
 THE TOP NUMBER IS THE CHI/Q.  THE MIDDLE NUMBER IS THE FREQUENCY NORMALIZED TO THIS SECTOR.
 THE THIRD NUMBER IS THE FREQUENCY WITH RESPECT TO ALL TIME.
0   4.504E-03   2.975E-03   1.746E-03   1.291E-03   4.306E-04   3.003E-04   2.885E-04   1.983E-04   1.801E-04   1.644E-04
        0.017       0.071       0.172       0.310       0.312       2.182      11.263      14.041      14.950      24.512
      0.00074     0.00306     0.00741     0.01333     0.01340     0.09377     0.48412     0.60353     0.64256     1.05358
0   1.164E-04   1.113E-04   1.086E-04   8.688E-05   8.608E-05   6.875E-05   5.550E-05   5.432E-05   4.583E-05   4.102E-05
       27.771      27.773      29.643      40.113      43.158      51.332      61.108      61.322      62.978      77.189
      1.19365     1.19373     1.27410     1.72416     1.85504     2.20636     2.62657     2.63575     2.70694     3.31773
0   3.437E-05   3.004E-05   2.871E-05   2.735E-05   2.051E-05   1.802E-05   1.435E-05   1.202E-05   8.612E-06   7.423E-06
       77.669      78.364      78.578      86.484      87.873      89.529      90.010      90.704      91.613      92.093
      3.33839     3.36825     3.37743     3.71727     3.77697     3.84815     3.86882     3.89867     3.93771     3.95837
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0   5.741E-06   4.306E-06   3.711E-06   2.227E-06   1.485E-06   1.113E-06
       92.574      92.788      95.833      99.092      99.786     100.000
      3.97904     3.98822     4.11911     4.25918     4.28903     4.29821
0          X/Q PERCENTILES
 (BASED ON THE UPPER ENVELOPE OF THE
 ORDERED X/Q-FREQUENCY VALUES, AND AS
 PLOTTED ON A LOG-NORMAL GRAPH.)
0 PERCENT OF TIME CHI/Q IS EQUALED OR EXCEEDED
        CHI/Q      WITH RESPECT TO     WHEN THE WIND BLOWS
 SEC/CUBIC METER  THE TOTAL TIME      INTO THIS SECTOR ONLY

                                                    HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 2)=   0.003
                                                    HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 3)=   0.484
                                                    HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 4)=   1.052
                                                    HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 5)=   1.853
                                                    HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 6)=   3.315
                                                    HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 7)=   3.714
     9.815E-04              0.043              1.000
     5.815E-04              0.129              3.000
     4.482E-04              0.215              5.000
     3.084E-04              0.430             10.000
     2.359E-04              0.645             15.000
     1.914E-04              0.860             20.000
     1.608E-04              1.075             25.000
     1.312E-04              1.289             30.000
     1.100E-04              1.504             35.000
     9.418E-05              1.719             40.000
     8.180E-05              1.934             45.000
     7.182E-05              2.149             50.000
     6.373E-05              2.364             55.000
     5.705E-05              2.579             60.000
     5.145E-05              2.794             65.000
     4.670E-05              3.009             70.000
     4.263E-05              3.224             75.000
     3.614E-05              3.439             80.000
     2.911E-05              3.653             85.000
0    2.821E-04              0.5               11.63
0ANNUAL AVERAGE =   1.10E-05
1USNRC COMPUTER CODE-PAVAN, VERSION 2.0          RUN DATE: Wed Apr 14 10:41:55 2004

/PLANT NAME: Palisades                           METEOROLOGICAL INSTRUMENTATION
 DATA PERIOD:  1999-2003                         WIND SENSORS HEIGHT: 10 Meters        DT
 TYPE OF RELEASE: Ground Level Release           DELTA-T HEIGHTS: from 10m to 60m
 SOURCE OF DATA: Data from onsite met tower
 COMMENTS: NONE
 PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145
0PARAMETER VALUES FOR THE CHI/Q CALCULATIONS FOR THE WNW SECTOR.
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STABILITY CLASS	WINDSPEED METER/SEC AT 10.0 METERS	FREQUENCY PERCENT	DISTANCE METERS	TERRAIN HT METERS	EFF PLUME HT METERS	SIGMA-Y METERS	SIGMA-Z METERS	MEANDER-SY METERS	** CHI/Q VALUES (SEC/CUBIC METER) MEANDER	BLDG WAKE CA=1006.SQ.METERS	USED
A	0.1	0.00	677.	0.	0.	131.7	215.2	131.7	1.126E-04	1.113E-04	1.113E-04
A	1.5	0.52	677.	0.	0.	131.7	215.2	131.7	7.507E-06	7.423E-06	7.423E-06
A	3.0	2.96	677.	0.	0.	131.7	215.2	131.7	3.753E-06	3.711E-06	3.711E-06
A	5.0	4.36	677.	0.	0.	131.7	215.2	131.7	2.252E-06	2.227E-06	2.227E-06
A	7.5	1.04	677.	0.	0.	131.7	215.2	131.7	1.501E-06	1.485E-06	1.485E-06
B	0.1	0.00	677.	0.	0.	99.0	71.6	99.0	4.500E-04	4.306E-04	4.306E-04
B	1.5	0.16	677.	0.	0.	99.0	71.6	99.0	3.000E-05	2.871E-05	2.871E-05
B	3.0	0.52	677.	0.	0.	99.0	71.6	99.0	1.500E-05	1.435E-05	1.435E-05
B	5.0	1.24	677.	0.	0.	99.0	71.6	99.0	9.000E-06	8.612E-06	8.612E-06
B	7.5	0.36	677.	0.	0.	99.0	71.6	99.0	6.000E-06	5.741E-06	5.741E-06
B	10.0	0.16	677.	0.	0.	99.0	71.6	99.0	4.500E-06	4.306E-06	4.306E-06
C	0.1	0.00	677.	0.	0.	75.2	42.8	75.2	9.907E-04	9.012E-04	9.012E-04
C	1.5	0.16	677.	0.	0.	75.2	42.8	75.2	6.605E-05	6.008E-05	6.008E-05
C	3.0	0.52	677.	0.	0.	75.2	42.8	75.2	3.302E-05	3.004E-05	3.004E-05
C	5.0	1.56	677.	0.	0.	75.2	42.8	75.2	1.981E-05	1.802E-05	1.802E-05
C	7.5	1.04	677.	0.	0.	75.2	42.8	75.2	1.321E-05	1.202E-05	1.202E-05
C	10.0	0.16	677.	0.	0.	75.2	42.8	75.2	9.907E-06	9.012E-06	9.012E-06
D	0.1	0.09	677.	0.	0.	53.0	23.3	105.9	1.291E-03	2.051E-03	1.291E-03
D	1.5	1.92	677.	0.	0.	53.0	23.3	105.9	8.608E-05	1.367E-04	8.608E-05
D	3.0	6.44	677.	0.	0.	53.0	23.3	82.1	5.550E-05	6.837E-05	5.550E-05
D	5.0	14.63	677.	0.	0.	53.0	23.3	59.5	4.596E-05	4.102E-05	4.102E-05
D	7.5	11.52	677.	0.	0.	53.0	23.3	53.0	3.443E-05	2.735E-05	2.735E-05
D	10.0	2.44	677.	0.	0.	53.0	23.3	53.0	2.582E-05	2.051E-05	2.051E-05
D	15.0	0.36	677.	0.	0.	53.0	23.3	53.0	1.722E-05	1.367E-05	1.367E-05
E	0.1	0.10	677.	0.	0.	37.7	16.2	113.0	1.746E-03	3.437E-03	1.746E-03
E	1.5	3.12	677.	0.	0.	37.7	16.2	113.0	1.164E-04	2.292E-04	1.164E-04
E	3.0	8.72	677.	0.	0.	37.7	16.2	75.7	8.688E-05	1.146E-04	8.688E-05
E	5.0	8.36	677.	0.	0.	37.7	16.2	45.4	8.688E-05	6.875E-05	6.875E-05
E	7.5	2.28	677.	0.	0.	37.7	16.2	37.7	6.985E-05	4.583E-05	4.583E-05
E	10.0	0.68	677.	0.	0.	37.7	16.2	37.7	5.239E-05	3.437E-05	3.437E-05
E	14.9	0.16	677.	0.	0.	37.7	16.2	37.7	3.493E-05	2.292E-05	2.292E-05
F	0.1	0.04	677.	0.	0.	26.0	10.3	104.0	2.975E-03	5.432E-03	2.975E-03
F	1.5	2.08	677.	0.	0.	26.0	10.3	104.0	1.983E-04	3.621E-04	1.983E-04
F	3.0	7.84	677.	0.	0.	26.0	10.3	62.7	1.644E-04	1.811E-04	1.644E-04
F	5.0	1.56	677.	0.	0.	26.0	10.3	32.9	1.879E-04	1.086E-04	1.086E-04
G	0.1	0.01	677.	0.	0.	17.9	6.6	107.6	4.504E-03	9.007E-03	4.504E-03
G	1.5	1.40	677.	0.	0.	17.9	6.6	107.6	3.003E-04	6.004E-04	3.003E-04

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    G         3.0      10.12      677.        0.          0.        17.9     6.6     56.0      2.885E-04   3.002E-04   2.885E-04
    G         5.0       1.40      677.        0.          0.        17.9     6.6     24.4      3.982E-04   1.801E-04   1.801E-04
1USNRC COMPUTER CODE-PAVAN, VERSION 2.0          RUN DATE: Wed Apr 14 10:41:55 2004

/PLANT NAME: Palisades                           METEOROLOGICAL INSTRUMENTATION
 DATA PERIOD:  1999-2003                         WIND SENSORS HEIGHT: 10 Meters        DT
 TYPE OF RELEASE: Ground Level Release           DELTA-T HEIGHTS: from 10m to 60m
 SOURCE OF DATA: Data from onsite met tower
 COMMENTS: NONE
 PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145
0SITE EXCLUSION BOUNDARY CALCULATIONS:
0 WNW SECTOR     BOUNDARY DISTANCE =  677.0 METERS
0LATERAL PLUME MEANDER/BUILDING WAKE CREDIT ALLOWED
 AS A FUNCTION OF DOWNWIND DISTANCE.
 MEANDER CREDIT IS FOR WINDSPEEDS LESS THAN 6 MPS.
 BUILDING WAKE CREDIT ALLOWED:   C=  0.5     A=  2011.     D=   58.5
 CORRECTION FACTORS USED IN THE ANNUAL AVERAGE CALCULATIONS.
0BELOW ARE PRINTED THE ORDERED VALUES OF CHI/Q AND THE FREQUENCY WITH WHICH THAT VALUE IS REACHED OR EXCEEDED.
 THE TOP NUMBER IS THE CHI/Q.  THE MIDDLE NUMBER IS THE FREQUENCY NORMALIZED TO THIS SECTOR.
 THE THIRD NUMBER IS THE FREQUENCY WITH RESPECT TO ALL TIME.
0   4.504E-03   2.975E-03   1.746E-03   1.291E-03   9.012E-04   4.306E-04   3.003E-04   2.885E-04   1.983E-04   1.801E-04
        0.013       0.053       0.150       0.237       0.239       0.240       1.640      11.756      13.835      15.234
      0.00074     0.00306     0.00862     0.01361     0.01374     0.01381     0.09418     0.67512     0.79452     0.87489
0   1.644E-04   1.164E-04   1.113E-04   1.086E-04   8.688E-05   8.608E-05   6.875E-05   6.008E-05   5.550E-05   4.583E-05
       23.071      26.189      26.191      27.751      36.467      38.386      46.743      46.903      53.340      55.619
      1.32495     1.50405     1.50417     1.59372     2.09429     2.20451     2.68442     2.69361     3.06330     3.19418
0   4.102E-05   3.437E-05   3.004E-05   2.871E-05   2.735E-05   2.292E-05   2.051E-05   1.802E-05   1.435E-05   1.367E-05
       70.253      70.932      71.452      71.612      83.127      83.287      85.726      87.285      87.805      88.165
      4.03459     4.07363     4.10348     4.11266     4.77397     4.78316     4.92323     5.01278     5.04263     5.06329
0   1.202E-05   9.012E-06   8.612E-06   7.423E-06   5.741E-06   4.306E-06   3.711E-06   2.227E-06   1.485E-06
       89.205      89.365      90.604      91.124      91.484      91.644      94.602      98.960     100.000
      5.12300     5.13218     5.20336     5.23321     5.25388     5.26307     5.43299     5.68327     5.74297
0          X/Q PERCENTILES
 (BASED ON THE UPPER ENVELOPE OF THE
 ORDERED X/Q-FREQUENCY VALUES, AND AS
 PLOTTED ON A LOG-NORMAL GRAPH.)
0 PERCENT OF TIME CHI/Q IS EQUALED OR EXCEEDED
        CHI/Q      WITH RESPECT TO     WHEN THE WIND BLOWS
 SEC/CUBIC METER  THE TOTAL TIME      INTO THIS SECTOR ONLY

                                                          HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 2)=   0.003
                                                          HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 3)=   0.674
                                                          HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 4)=   1.323
                                                          HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 5)=   2.682
                                                          HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 6)=   4.031
                                                          HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 7)=   4.770
     9.436E-04              0.057              1.000
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     5.750E-04              0.172              3.000
     4.492E-04              0.287              5.000
     3.147E-04              0.574             10.000
     2.367E-04              0.861             15.000
     1.859E-04              1.149             20.000
     1.495E-04              1.436             25.000
     1.201E-04              1.723             30.000
     9.936E-05              2.010             35.000
     8.400E-05              2.297             40.000
     7.222E-05              2.584             45.000
     6.328E-05              2.871             50.000
     5.619E-05              3.159             55.000
     5.032E-05              3.446             60.000
     4.540E-05              3.733             65.000
     4.122E-05              4.020             70.000
     3.510E-05              4.307             75.000
     3.003E-05              4.594             80.000
0    3.386E-04              0.5                8.71
0ANNUAL AVERAGE =   1.30E-05
1USNRC COMPUTER CODE-PAVAN, VERSION 2.0          RUN DATE: Wed Apr 14 10:41:55 2004

/PLANT NAME: Palisades                           METEOROLOGICAL INSTRUMENTATION
 DATA PERIOD:  1999-2003                         WIND SENSORS HEIGHT: 10 Meters       DT
 TYPE OF RELEASE: Ground Level Release           DELTA-T HEIGHTS: from 10m to 60m
 SOURCE OF DATA: Data from onsite met tower
 COMMENTS: NONE
 PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145
0PARAMETER VALUES FOR THE CHI/Q CALCULATIONS FOR THE  NW SECTOR.
 STABILITY WINDSPEED FREQUENCY DISTANCE TERRAIN HT EFF PLUME HT  SIGMA-Y SIGMA-Z MEANDER-SY  ** CHI/Q VALUES (SEC/CUBIC METER)
   CLASS   METER/SEC  PERCENT   METERS    METERS      METERS      METERS  METERS   METERS        MEANDER   BLDG WAKE        USED
         AT  10.0 METERS                                                                              CA=1006.SQ.METERS

    A         0.1       0.00      677.        0.          0.       131.7   215.2    131.7      1.126E-04   1.113E-04   1.113E-04
    A         1.5       0.37      677.        0.          0.       131.7   215.2    131.7      7.507E-06   7.423E-06   7.423E-06
    A         3.0       2.63      677.        0.          0.       131.7   215.2    131.7      3.753E-06   3.711E-06   3.711E-06
    A         5.0       4.98      677.        0.          0.       131.7   215.2    131.7      2.252E-06   2.227E-06   2.227E-06
    A         7.5       1.49      677.        0.          0.       131.7   215.2    131.7      1.501E-06   1.485E-06   1.485E-06
    A        10.0       0.26      677.        0.          0.       131.7   215.2    131.7      1.126E-06   1.113E-06   1.113E-06

    B         3.0       0.49      677.        0.          0.        99.0    71.6     99.0      1.500E-05   1.435E-05   1.435E-05
    B         5.0       1.26      677.        0.          0.        99.0    71.6     99.0      9.000E-06   8.612E-06   8.612E-06
    B         7.5       0.63      677.        0.          0.        99.0    71.6     99.0      6.000E-06   5.741E-06   5.741E-06
    B        10.0       0.11      677.        0.          0.        99.0    71.6     99.0      4.500E-06   4.306E-06   4.306E-06

    C         3.0       0.49      677.        0.          0.        75.2    42.8     75.2      3.302E-05   3.004E-05   3.004E-05
    C         5.0       1.86      677.        0.          0.        75.2    42.8     75.2      1.981E-05   1.802E-05   1.802E-05
    C         7.5       1.00      677.        0.          0.        75.2    42.8     75.2      1.321E-05   1.202E-05   1.202E-05
```

C	10.0	0.11	677.	0.	0.	75.2	42.8	75.2	9.907E-06	9.012E-06	9.012E-06
D	0.1	0.06	677.	0.	0.	53.0	23.3	105.9	1.291E-03	2.051E-03	1.291E-03
D	1.5	1.37	677.	0.	0.	53.0	23.3	105.9	8.608E-05	1.367E-04	8.608E-05
D	3.0	6.61	677.	0.	0.	53.0	23.3	82.1	5.550E-05	6.837E-05	5.550E-05
D	5.0	12.47	677.	0.	0.	53.0	23.3	59.5	4.596E-05	4.102E-05	4.102E-05
D	7.5	8.35	677.	0.	0.	53.0	23.3	53.0	3.443E-05	2.735E-05	2.735E-05
D	10.0	1.63	677.	0.	0.	53.0	23.3	53.0	2.582E-05	2.051E-05	2.051E-05
E	0.1	0.07	677.	0.	0.	37.7	16.2	113.0	1.746E-03	3.437E-03	1.746E-03
E	1.5	2.37	677.	0.	0.	37.7	16.2	113.0	1.164E-04	2.292E-04	1.164E-04
E	3.0	9.21	677.	0.	0.	37.7	16.2	75.7	8.688E-05	1.146E-04	8.688E-05
E	5.0	9.72	677.	0.	0.	37.7	16.2	45.4	8.688E-05	6.875E-05	6.875E-05
E	7.5	3.49	677.	0.	0.	37.7	16.2	37.7	6.985E-05	4.583E-05	4.583E-05
E	10.0	0.49	677.	0.	0.	37.7	16.2	37.7	5.239E-05	3.437E-05	3.437E-05
F	0.1	0.04	677.	0.	0.	26.0	10.3	104.0	2.975E-03	5.432E-03	2.975E-03
F	1.5	2.23	677.	0.	0.	26.0	10.3	104.0	1.983E-04	3.621E-04	1.983E-04
F	3.0	7.86	677.	0.	0.	26.0	10.3	62.7	1.644E-04	1.811E-04	1.644E-04
F	5.0	2.75	677.	0.	0.	26.0	10.3	32.9	1.879E-04	1.086E-04	1.086E-04
G	0.1	0.01	677.	0.	0.	17.9	6.6	107.6	4.504E-03	9.007E-03	4.504E-03
G	1.5	1.37	677.	0.	0.	17.9	6.6	107.6	3.003E-04	6.004E-04	3.003E-04
G	3.0	13.21	677.	0.	0.	17.9	6.6	56.0	2.885E-04	3.002E-04	2.885E-04
G	5.0	1.00	677.	0.	0.	17.9	6.6	24.4	3.982E-04	1.801E-04	1.801E-04

1USNRC COMPUTER CODE-PAVAN, VERSION 2.0 RUN DATE: Wed Apr 14 10:41:55 2004

/PLANT NAME: Palisades METEOROLOGICAL INSTRUMENTATION
DATA PERIOD: 1999-2003 WIND SENSORS HEIGHT: 10 Meters DT
TYPE OF RELEASE: Ground Level Release DELTA-T HEIGHTS: from 10m to 60m
SOURCE OF DATA: Data from onsite met tower
COMMENTS: NONE
PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145
0SITE EXCLUSION BOUNDARY CALCULATIONS:
0 NW SECTOR BOUNDARY DISTANCE = 677.0 METERS
0LATERAL PLUME MEANDER/BUILDING WAKE CREDIT ALLOWED
AS A FUNCTION OF DOWNWIND DISTANCE.
MEANDER CREDIT IS FOR WINDSPEEDS LESS THAN 6 MPS.
BUILDING WAKE CREDIT ALLOWED: C= 0.5 A= 2011. D= 58.5
CORRECTION FACTORS USED IN THE ANNUAL AVERAGE CALCULATIONS.
0BELOW ARE PRINTED THE ORDERED VALUES OF CHI/Q AND THE FREQUENCY WITH WHICH THAT VALUE IS REACHED OR EXCEEDED.
THE TOP NUMBER IS THE CHI/Q. THE MIDDLE NUMBER IS THE FREQUENCY NORMALIZED TO THIS SECTOR.
THE THIRD NUMBER IS THE FREQUENCY WITH RESPECT TO ALL TIME.

0	4.504E-03	2.975E-03	1.746E-03	1.291E-03	3.003E-04	2.885E-04	1.983E-04	1.801E-04	1.644E-04	1.164E-04
	0.013	0.056	0.130	0.192	1.564	14.777	17.007	18.008	25.873	28.246
	0.00102	0.00449	0.01041	0.01540	0.12561	1.18646	1.36557	1.44594	2.07739	2.26798
0	1.113E-04	1.086E-04	8.688E-05	8.608E-05	6.875E-05	5.550E-05	4.583E-05	4.102E-05	3.437E-05	3.004E-05

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       28.248      30.993      40.202      41.574      51.298      57.904      61.393      73.861      74.348      74.834
      2.26809     2.48853     3.22791     3.33813     4.11884     4.64926     4.92940     5.93055     5.96959     6.00862
0   2.735E-05   2.051E-05   1.802E-05   1.435E-05   1.202E-05   9.012E-06   8.612E-06   7.423E-06   5.741E-06   4.306E-06
       83.184      84.814      86.673      87.160      88.160      88.275      89.533      89.905      90.534      90.648
      6.67912     6.81000     6.95925     6.99829     7.07866     7.08784     7.18888     7.21873     7.26924     7.27843
0   3.711E-06   2.227E-06   1.485E-06   1.113E-06
       93.279      98.256      99.743     100.000
      7.48968     7.88922     8.00862     8.02929
0          X/Q PERCENTILES
 (BASED ON THE UPPER ENVELOPE OF THE
 ORDERED X/Q-FREQUENCY VALUES, AND AS
 PLOTTED ON A LOG-NORMAL GRAPH.)
0 PERCENT OF TIME CHI/Q IS EQUALED OR EXCEEDED
        CHI/Q      WITH RESPECT TO     WHEN THE WIND BLOWS
 SEC/CUBIC METER  THE TOTAL TIME      INTO THIS SECTOR ONLY

                                                          HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 2)=   0.004
                                                          HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 3)=   1.185
                                                          HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 4)=   2.075
                                                          HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 5)=   4.115
                                                          HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 6)=   5.927
                                                          HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 7)=   6.675
     1.017E-03              0.080              1.000
     6.331E-04              0.241              3.000
     4.995E-04              0.401              5.000
     3.545E-04              0.803             10.000
     2.843E-04              1.204             15.000
     2.141E-04              1.606             20.000
     1.703E-04              2.007             25.000
     1.373E-04              2.409             30.000
     1.133E-04              2.810             35.000
     9.550E-05              3.212             40.000
     8.189E-05              3.613             45.000
     7.116E-05              4.015             50.000
     6.246E-05              4.416             55.000
     5.532E-05              4.818             60.000
     4.938E-05              5.219             65.000
     4.437E-05              5.621             70.000
     3.896E-05              6.022             75.000
     3.128E-05              6.423             80.000
0    4.494E-04              0.5                6.23
0ANNUAL AVERAGE =   1.86E-05
1USNRC COMPUTER CODE-PAVAN, VERSION 2.0          RUN DATE: Wed Apr 14 10:41:55 2004

/PLANT NAME: Palisades                           METEOROLOGICAL INSTRUMENTATION
 DATA PERIOD:  1999-2003                         WIND SENSORS HEIGHT: 10 Meters        DT
 TYPE OF RELEASE: Ground Level Release           DELTA-T HEIGHTS: from 10m to 60m
```

SOURCE OF DATA: Data from onsite met tower
COMMENTS: NONE
PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145
0PARAMETER VALUES FOR THE CHI/Q CALCULATIONS FOR THE NNW SECTOR.

STABILITY CLASS	WINDSPEED AT 10.0 METERS METER/SEC	FREQUENCY PERCENT	DISTANCE METERS	TERRAIN HT METERS	EFF PLUME HT METERS	SIGMA-Y METERS	SIGMA-Z METERS	MEANDER-SY METERS	** CHI/Q VALUES (SEC/CUBIC METER) MEANDER	BLDG WAKE CA=1006.SQ.METERS	USED
A	0.1	0.00	677.	0.	0.	131.7	215.2	131.7	1.126E-04	1.113E-04	1.113E-04
A	1.5	0.47	677.	0.	0.	131.7	215.2	131.7	7.507E-06	7.423E-06	7.423E-06
A	3.0	4.18	677.	0.	0.	131.7	215.2	131.7	3.753E-06	3.711E-06	3.711E-06
A	5.0	4.09	677.	0.	0.	131.7	215.2	131.7	2.252E-06	2.227E-06	2.227E-06
A	7.5	1.11	677.	0.	0.	131.7	215.2	131.7	1.501E-06	1.485E-06	1.485E-06
A	10.0	0.19	677.	0.	0.	131.7	215.2	131.7	1.126E-06	1.113E-06	1.113E-06
B	0.1	0.00	677.	0.	0.	99.0	71.6	99.0	4.500E-04	4.306E-04	4.306E-04
B	1.5	0.19	677.	0.	0.	99.0	71.6	99.0	3.000E-05	2.871E-05	2.871E-05
B	3.0	0.55	677.	0.	0.	99.0	71.6	99.0	1.500E-05	1.435E-05	1.435E-05
B	5.0	0.94	677.	0.	0.	99.0	71.6	99.0	9.000E-06	8.612E-06	8.612E-06
B	7.5	0.28	677.	0.	0.	99.0	71.6	99.0	6.000E-06	5.741E-06	5.741E-06
C	0.1	0.00	677.	0.	0.	75.2	42.8	75.2	9.907E-04	9.012E-04	9.012E-04
C	1.5	0.09	677.	0.	0.	75.2	42.8	75.2	6.605E-05	6.008E-05	6.008E-05
C	3.0	0.83	677.	0.	0.	75.2	42.8	75.2	3.302E-05	3.004E-05	3.004E-05
C	5.0	1.39	677.	0.	0.	75.2	42.8	75.2	1.981E-05	1.802E-05	1.802E-05
C	7.5	0.66	677.	0.	0.	75.2	42.8	75.2	1.321E-05	1.202E-05	1.202E-05
D	0.1	0.08	677.	0.	0.	53.0	23.3	105.9	1.291E-03	2.051E-03	1.291E-03
D	1.5	1.66	677.	0.	0.	53.0	23.3	105.9	8.608E-05	1.367E-04	8.608E-05
D	3.0	8.08	677.	0.	0.	53.0	23.3	82.1	5.550E-05	6.837E-05	5.550E-05
D	5.0	12.06	677.	0.	0.	53.0	23.3	59.5	4.596E-05	4.102E-05	4.102E-05
D	7.5	5.28	677.	0.	0.	53.0	23.3	53.0	3.443E-05	2.735E-05	2.735E-05
D	10.0	0.47	677.	0.	0.	53.0	23.3	53.0	2.582E-05	2.051E-05	2.051E-05
E	0.1	0.10	677.	0.	0.	37.7	16.2	113.0	1.746E-03	3.437E-03	1.746E-03
E	1.5	3.07	677.	0.	0.	37.7	16.2	113.0	1.164E-04	2.292E-04	1.164E-04
E	3.0	11.89	677.	0.	0.	37.7	16.2	75.7	8.688E-05	1.146E-04	8.688E-05
E	5.0	9.76	677.	0.	0.	37.7	16.2	45.4	8.688E-05	6.875E-05	6.875E-05
E	7.5	2.51	677.	0.	0.	37.7	16.2	37.7	6.985E-05	4.583E-05	4.583E-05
E	10.0	0.28	677.	0.	0.	37.7	16.2	37.7	5.239E-05	3.437E-05	3.437E-05
F	0.1	0.05	677.	0.	0.	26.0	10.3	104.0	2.975E-03	5.432E-03	2.975E-03
F	1.5	2.60	677.	0.	0.	26.0	10.3	104.0	1.983E-04	3.621E-04	1.983E-04
F	3.0	8.74	677.	0.	0.	26.0	10.3	62.7	1.644E-04	1.811E-04	1.644E-04
F	5.0	1.96	677.	0.	0.	26.0	10.3	32.9	1.879E-04	1.086E-04	1.086E-04
G	0.1	0.02	677.	0.	0.	17.9	6.6	107.6	4.504E-03	9.007E-03	4.504E-03

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    G         1.5       2.24      677.        0.          0.        17.9     6.6    107.6      3.003E-04   6.004E-04   3.003E-04
    G         3.0      12.81      677.        0.          0.        17.9     6.6     56.0      2.885E-04   3.002E-04   2.885E-04
    G         5.0       1.39      677.        0.          0.        17.9     6.6     24.4      3.982E-04   1.801E-04   1.801E-04
1USNRC COMPUTER CODE-PAVAN, VERSION 2.0          RUN DATE: Wed Apr 14 10:41:55 2004

/PLANT NAME: Palisades                           METEOROLOGICAL INSTRUMENTATION
 DATA PERIOD:  1999-2003                         WIND SENSORS HEIGHT: 10 Meters        DT
 TYPE OF RELEASE: Ground Level Release           DELTA-T HEIGHTS: from 10m to 60m
 SOURCE OF DATA: Data from onsite met tower
 COMMENTS: NONE
 PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145
0SITE EXCLUSION BOUNDARY CALCULATIONS:
0 NNW SECTOR     BOUNDARY DISTANCE =  677.0 METERS
0LATERAL PLUME MEANDER/BUILDING WAKE CREDIT ALLOWED
 AS A FUNCTION OF DOWNWIND DISTANCE.
 MEANDER CREDIT IS FOR WINDSPEEDS LESS THAN 6 MPS.
 BUILDING WAKE CREDIT ALLOWED:   C=  0.5     A=  2011.     D=   58.5
 CORRECTION FACTORS USED IN THE ANNUAL AVERAGE CALCULATIONS.
0BELOW ARE PRINTED THE ORDERED VALUES OF CHI/Q AND THE FREQUENCY WITH WHICH THAT VALUE IS REACHED OR EXCEEDED.
 THE TOP NUMBER IS THE CHI/Q.  THE MIDDLE NUMBER IS THE FREQUENCY NORMALIZED TO THIS SECTOR.
 THE THIRD NUMBER IS THE FREQUENCY WITH RESPECT TO ALL TIME.
0   4.504E-03   2.975E-03   1.746E-03   1.291E-03   9.012E-04   4.306E-04   3.003E-04   2.885E-04   1.983E-04   1.801E-04
        0.021       0.071       0.166       0.242       0.243       0.244       2.482      15.289      17.889      19.274
      0.00222     0.00766     0.01793     0.02603     0.02616     0.02633     0.26743     1.64745     1.92759     2.07684
0   1.644E-04   1.164E-04   1.113E-04   1.086E-04   8.688E-05   8.608E-05   6.875E-05   6.008E-05   5.550E-05   4.583E-05
       28.012      31.080      31.082      33.043      44.934      46.596      56.356      56.442      64.518      67.033
      3.01829     3.34895     3.34914     3.56039     4.84168     5.02078     6.07245     6.08163     6.95190     7.22285
0   4.102E-05   3.437E-05   3.004E-05   2.871E-05   2.735E-05   2.051E-05   1.802E-05   1.435E-05   1.202E-05   8.612E-06
       79.095      79.372      80.203      80.394      85.679      86.148      87.533      88.088      88.748      89.686
      8.52250     8.55236     8.64191     8.66257     9.23203     9.28255     9.43181     9.49151     9.56269     9.66372
0   7.423E-06   5.741E-06   3.711E-06   2.227E-06   1.485E-06   1.113E-06
       90.155      90.432      94.608      98.700      99.808     100.000
      9.71424     9.74409    10.19415    10.63502    10.75442    10.77509
0          X/Q PERCENTILES
 (BASED ON THE UPPER ENVELOPE OF THE
 ORDERED X/Q-FREQUENCY VALUES, AND AS
 PLOTTED ON A LOG-NORMAL GRAPH.)
0 PERCENT OF TIME CHI/Q IS EQUALED OR EXCEEDED
        CHI/Q      WITH RESPECT TO     WHEN THE WIND BLOWS
 SEC/CUBIC METER  THE TOTAL TIME      INTO THIS SECTOR ONLY

                                                                HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 2)=   0.008
                                                                HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 3)=   1.646
                                                                HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 4)=   3.015
                                                                HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 5)=   6.069
                                                                HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 6)=   8.519
                                                                HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 7)=   9.229
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     1.080E-03              0.108              1.000
     6.639E-04              0.323              3.000
     5.199E-04              0.539              5.000
     3.644E-04              1.078             10.000
     2.916E-04              1.616             15.000
     2.262E-04              2.155             20.000
     1.834E-04              2.694             25.000
     1.516E-04              3.233             30.000
     1.261E-04              3.771             35.000
     1.070E-04              4.310             40.000
     9.221E-05              4.849             45.000
     8.050E-05              5.388             50.000
     7.101E-05              5.926             55.000
     6.268E-05              6.465             60.000
     5.559E-05              7.004             65.000
     4.965E-05              7.543             70.000
     4.461E-05              8.081             75.000
     3.874E-05              8.620             80.000
     2.849E-05              9.159             85.000
0    5.392E-04              0.5                4.64
0ANNUAL AVERAGE =   2.82E-05
1USNRC COMPUTER CODE-PAVAN, VERSION 2.0          RUN DATE: Wed Apr 14 10:41:55 2004

/PLANT NAME: Palisades                           METEOROLOGICAL INSTRUMENTATION
 DATA PERIOD:  1999-2003                         WIND SENSORS HEIGHT: 10 Meters        DT
 TYPE OF RELEASE: Ground Level Release           DELTA-T HEIGHTS: from 10m to 60m
 SOURCE OF DATA: Data from onsite met tower
 COMMENTS: NONE
 PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145
0PARAMETER VALUES FOR THE CHI/Q CALCULATIONS FOR THE   N SECTOR.
 STABILITY WINDSPEED FREQUENCY DISTANCE TERRAIN HT EFF PLUME HT  SIGMA-Y SIGMA-Z MEANDER-SY  ** CHI/Q VALUES (SEC/CUBIC METER)
   CLASS   METER/SEC  PERCENT   METERS    METERS      METERS      METERS  METERS   METERS        MEANDER   BLDG WAKE        USED
         AT  10.0 METERS                                                                                  CA=1006.SQ.METERS

    A         0.1       0.00      677.        0.          0.       131.7   215.2    131.7      1.126E-04   1.113E-04   1.113E-04
    A         1.5       1.02      677.        0.          0.       131.7   215.2    131.7      7.507E-06   7.423E-06   7.423E-06
    A         3.0       3.82      677.        0.          0.       131.7   215.2    131.7      3.753E-06   3.711E-06   3.711E-06
    A         5.0       3.68      677.        0.          0.       131.7   215.2    131.7      2.252E-06   2.227E-06   2.227E-06
    A         7.5       0.38      677.        0.          0.       131.7   215.2    131.7      1.501E-06   1.485E-06   1.485E-06

    B         0.1       0.00      677.        0.          0.        99.0    71.6     99.0      4.500E-04   4.306E-04   4.306E-04
    B         1.5       0.12      677.        0.          0.        99.0    71.6     99.0      3.000E-05   2.871E-05   2.871E-05
    B         3.0       1.02      677.        0.          0.        99.0    71.6     99.0      1.500E-05   1.435E-05   1.435E-05
    B         5.0       0.76      677.        0.          0.        99.0    71.6     99.0      9.000E-06   8.612E-06   8.612E-06

    C         0.1       0.01      677.        0.          0.        75.2    42.8     75.2      9.907E-04   9.012E-04   9.012E-04
    C         1.5       0.38      677.        0.          0.        75.2    42.8     75.2      6.605E-05   6.008E-05   6.008E-05
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    C         3.0       1.52      677.        0.          0.        75.2    42.8     75.2      3.302E-05   3.004E-05   3.004E-05
    C         5.0       1.28      677.        0.          0.        75.2    42.8     75.2      1.981E-05   1.802E-05   1.802E-05
    C         7.5       0.12      677.        0.          0.        75.2    42.8     75.2      1.321E-05   1.202E-05   1.202E-05

    D         0.1       0.11      677.        0.          0.        53.0    23.3    105.9      1.291E-03   2.051E-03   1.291E-03
    D         1.5       2.54      677.        0.          0.        53.0    23.3    105.9      8.608E-05   1.367E-04   8.608E-05
    D         3.0      13.11      677.        0.          0.        53.0    23.3     82.1      5.550E-05   6.837E-05   5.550E-05
    D         5.0       8.41      677.        0.          0.        53.0    23.3     59.5      4.596E-05   4.102E-05   4.102E-05
    D         7.5       1.28      677.        0.          0.        53.0    23.3     53.0      3.443E-05   2.735E-05   2.735E-05

    E         0.1       0.14      677.        0.          0.        37.7    16.2    113.0      1.746E-03   3.437E-03   1.746E-03
    E         1.5       4.58      677.        0.          0.        37.7    16.2    113.0      1.164E-04   2.292E-04   1.164E-04
    E         3.0      17.81      677.        0.          0.        37.7    16.2     75.7      8.688E-05   1.146E-04   8.688E-05
    E         5.0       5.60      677.        0.          0.        37.7    16.2     45.4      8.688E-05   6.875E-05   6.875E-05
    E         7.5       0.38      677.        0.          0.        37.7    16.2     37.7      6.985E-05   4.583E-05   4.583E-05

    F         0.1       0.07      677.        0.          0.        26.0    10.3    104.0      2.975E-03   5.432E-03   2.975E-03
    F         1.5       3.82      677.        0.          0.        26.0    10.3    104.0      1.983E-04   3.621E-04   1.983E-04
    F         3.0       8.14      677.        0.          0.        26.0    10.3     62.7      1.644E-04   1.811E-04   1.644E-04
    F         5.0       0.38      677.        0.          0.        26.0    10.3     32.9      1.879E-04   1.086E-04   1.086E-04

    G         0.1       0.03      677.        0.          0.        17.9     6.6    107.6      4.504E-03   9.007E-03   4.504E-03
    G         1.5       3.44      677.        0.          0.        17.9     6.6    107.6      3.003E-04   6.004E-04   3.003E-04
    G         3.0      15.00      677.        0.          0.        17.9     6.6     56.0      2.885E-04   3.002E-04   2.885E-04
    G         5.0       1.02      677.        0.          0.        17.9     6.6     24.4      3.982E-04   1.801E-04   1.801E-04
1USNRC COMPUTER CODE-PAVAN, VERSION 2.0          RUN DATE: Wed Apr 14 10:41:55 2004

/PLANT NAME: Palisades                           METEOROLOGICAL INSTRUMENTATION
 DATA PERIOD:  1999-2003                         WIND SENSORS HEIGHT: 10 Meters       DT
 TYPE OF RELEASE: Ground Level Release           DELTA-T HEIGHTS: from 10m to 60m
 SOURCE OF DATA: Data from onsite met tower
 COMMENTS: NONE
 PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145
0SITE EXCLUSION BOUNDARY CALCULATIONS:
0   N SECTOR     BOUNDARY DISTANCE =  677.0 METERS
0LATERAL PLUME MEANDER/BUILDING WAKE CREDIT ALLOWED
 AS A FUNCTION OF DOWNWIND DISTANCE.
 MEANDER CREDIT IS FOR WINDSPEEDS LESS THAN 6 MPS.
 BUILDING WAKE CREDIT ALLOWED:   C=  0.5     A=  2011.     D=   58.5
 CORRECTION FACTORS USED IN THE ANNUAL AVERAGE CALCULATIONS.
0BELOW ARE PRINTED THE ORDERED VALUES OF CHI/Q AND THE FREQUENCY WITH WHICH THAT VALUE IS REACHED OR EXCEEDED.
 THE TOP NUMBER IS THE CHI/Q.  THE MIDDLE NUMBER IS THE FREQUENCY NORMALIZED TO THIS SECTOR.
 THE THIRD NUMBER IS THE FREQUENCY WITH RESPECT TO ALL TIME.
0   4.504E-03   2.975E-03   1.746E-03   1.291E-03   9.012E-04   4.306E-04   3.003E-04   2.885E-04   1.983E-04   1.801E-04
        0.032       0.106       0.248       0.363       0.369       0.370       3.814      18.818      22.642      23.663
      0.00250     0.00834     0.01953     0.02857     0.02900     0.02907     0.30003     1.48028     1.78108     1.86145
0   1.644E-04   1.164E-04   1.113E-04   1.086E-04   8.688E-05   8.608E-05   6.875E-05   6.008E-05   5.550E-05   4.583E-05
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       31.808      36.390      36.394      36.774      54.580      57.119      62.724      63.103      76.210      76.589
      2.50209     2.86260     2.86291     2.89276     4.29345     4.49322     4.93409     4.96394     5.99494     6.02479
0   4.102E-05   3.004E-05   2.871E-05   2.735E-05   1.802E-05   1.435E-05   1.202E-05   8.612E-06   7.423E-06   3.711E-06
       84.996      86.514      86.631      87.915      89.200      90.221      90.338      91.097      92.119      95.943
      6.68610     6.80550     6.81469     6.91572     7.01675     7.09712     7.10631     7.16601     7.24637     7.54718
0   2.227E-06   1.485E-06
       99.621     100.000
      7.83650     7.86635
0          X/Q PERCENTILES
 (BASED ON THE UPPER ENVELOPE OF THE
 ORDERED X/Q-FREQUENCY VALUES, AND AS
 PLOTTED ON A LOG-NORMAL GRAPH.)
0 PERCENT OF TIME CHI/Q IS EQUALED OR EXCEEDED
        CHI/Q      WITH RESPECT TO     WHEN THE WIND BLOWS
 SEC/CUBIC METER  THE TOTAL TIME      INTO THIS SECTOR ONLY

                                                          HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 2)=   0.008
                                                          HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 3)=   1.479
                                                          HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 4)=   4.490
                                                          HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 5)=   5.991
                                                          HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 6)=   6.682
     1.226E-03              0.079              1.000
     7.494E-04              0.236              3.000
     5.858E-04              0.393              5.000
     4.102E-04              0.787             10.000
     3.284E-04              1.180             15.000
     2.714E-04              1.573             20.000
     2.160E-04              1.967             25.000
     1.782E-04              2.360             30.000
     1.508E-04              2.753             35.000
     1.301E-04              3.147             40.000
     1.138E-04              3.540             45.000
     1.008E-04              3.933             50.000
     9.005E-05              4.326             55.000
     8.001E-05              4.720             60.000
     7.094E-05              5.113             65.000
     6.334E-05              5.506             70.000
     5.691E-05              5.900             75.000
     4.856E-05              6.293             80.000
0    5.194E-04              0.5                6.36
0ANNUAL AVERAGE =   2.57E-05
1USNRC COMPUTER CODE-PAVAN, VERSION 2.0          RUN DATE: Wed Apr 14 10:41:55 2004

/PLANT NAME: Palisades                           METEOROLOGICAL INSTRUMENTATION
 DATA PERIOD:  1999-2003                         WIND SENSORS HEIGHT: 10 Meters       DT
 TYPE OF RELEASE: Ground Level Release           DELTA-T HEIGHTS: from 10m to 60m
 SOURCE OF DATA: Data from onsite met tower
```

COMMENTS: NONE
PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145
0PARAMETER VALUES FOR THE CHI/Q CALCULATIONS FOR THE NNE SECTOR.

STABILITY CLASS	WINDSPEED METER/SEC AT 10.0 METERS	FREQUENCY PERCENT	DISTANCE METERS	TERRAIN HT METERS	EFF PLUME HT METERS	SIGMA-Y METERS	SIGMA-Z METERS	MEANDER-SY METERS	** CHI/Q VALUES (SEC/CUBIC METER) MEANDER	BLDG WAKE CA=1006.SQ.METERS	USED
A	0.1	0.00	677.	0.	0.	131.7	215.2	131.7	1.126E-04	1.113E-04	1.113E-04
A	1.5	0.88	677.	0.	0.	131.7	215.2	131.7	7.507E-06	7.423E-06	7.423E-06
A	3.0	4.30	677.	0.	0.	131.7	215.2	131.7	3.753E-06	3.711E-06	3.711E-06
A	5.0	1.81	677.	0.	0.	131.7	215.2	131.7	2.252E-06	2.227E-06	2.227E-06
B	0.1	0.00	677.	0.	0.	99.0	71.6	99.0	4.500E-04	4.306E-04	4.306E-04
B	1.5	0.21	677.	0.	0.	99.0	71.6	99.0	3.000E-05	2.871E-05	2.871E-05
B	3.0	1.35	677.	0.	0.	99.0	71.6	99.0	1.500E-05	1.435E-05	1.435E-05
B	5.0	0.67	677.	0.	0.	99.0	71.6	99.0	9.000E-06	8.612E-06	8.612E-06
C	3.0	1.60	677.	0.	0.	75.2	42.8	75.2	3.302E-05	3.004E-05	3.004E-05
C	5.0	0.67	677.	0.	0.	75.2	42.8	75.2	1.981E-05	1.802E-05	1.802E-05
C	7.5	0.21	677.	0.	0.	75.2	42.8	75.2	1.321E-05	1.202E-05	1.202E-05
D	0.1	0.17	677.	0.	0.	53.0	23.3	105.9	1.291E-03	2.051E-03	1.291E-03
D	1.5	3.83	677.	0.	0.	53.0	23.3	105.9	8.608E-05	1.367E-04	8.608E-05
D	3.0	14.91	677.	0.	0.	53.0	23.3	82.1	5.550E-05	6.837E-05	5.550E-05
D	5.0	14.24	677.	0.	0.	53.0	23.3	59.5	4.596E-05	4.102E-05	4.102E-05
D	7.5	1.35	677.	0.	0.	53.0	23.3	53.0	3.443E-05	2.735E-05	2.735E-05
E	0.1	0.15	677.	0.	0.	37.7	16.2	113.0	1.746E-03	3.437E-03	1.746E-03
E	1.5	4.76	677.	0.	0.	37.7	16.2	113.0	1.164E-04	2.292E-04	1.164E-04
E	3.0	18.74	677.	0.	0.	37.7	16.2	75.7	8.688E-05	1.146E-04	8.688E-05
E	5.0	9.27	677.	0.	0.	37.7	16.2	45.4	8.688E-05	6.875E-05	6.875E-05
E	7.5	0.47	677.	0.	0.	37.7	16.2	37.7	6.985E-05	4.583E-05	4.583E-05
F	0.1	0.04	677.	0.	0.	26.0	10.3	104.0	2.975E-03	5.432E-03	2.975E-03
F	1.5	2.28	677.	0.	0.	26.0	10.3	104.0	1.983E-04	3.621E-04	1.983E-04
F	3.0	6.99	677.	0.	0.	26.0	10.3	62.7	1.644E-04	1.811E-04	1.644E-04
F	5.0	0.67	677.	0.	0.	26.0	10.3	32.9	1.879E-04	1.086E-04	1.086E-04
G	0.1	0.02	677.	0.	0.	17.9	6.6	107.6	4.504E-03	9.007E-03	4.504E-03
G	1.5	2.28	677.	0.	0.	17.9	6.6	107.6	3.003E-04	6.004E-04	3.003E-04
G	3.0	7.92	677.	0.	0.	17.9	6.6	56.0	2.885E-04	3.002E-04	2.885E-04
G	5.0	0.21	677.	0.	0.	17.9	6.6	24.4	3.982E-04	1.801E-04	1.801E-04

1USNRC COMPUTER CODE-PAVAN, VERSION 2.0 RUN DATE: Wed Apr 14 10:41:55 2004

/PLANT NAME: Palisades METEOROLOGICAL INSTRUMENTATION
DATA PERIOD: 1999-2003 WIND SENSORS HEIGHT: 10 Meters DT
TYPE OF RELEASE: Ground Level Release DELTA-T HEIGHTS: from 10m to 60m

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 SOURCE OF DATA: Data from onsite met tower
 COMMENTS: NONE
 PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145
0SITE EXCLUSION BOUNDARY CALCULATIONS:
0 NNE SECTOR     BOUNDARY DISTANCE =  677.0 METERS
0LATERAL PLUME MEANDER/BUILDING WAKE CREDIT ALLOWED
 AS A FUNCTION OF DOWNWIND DISTANCE.
 MEANDER CREDIT IS FOR WINDSPEEDS LESS THAN 6 MPS.
 BUILDING WAKE CREDIT ALLOWED:   C=  0.5     A=  2011.     D=   58.5
 CORRECTION FACTORS USED IN THE ANNUAL AVERAGE CALCULATIONS.
0BELOW ARE PRINTED THE ORDERED VALUES OF CHI/Q AND THE FREQUENCY WITH WHICH THAT VALUE IS REACHED OR EXCEEDED.
 THE TOP NUMBER IS THE CHI/Q.  THE MIDDLE NUMBER IS THE FREQUENCY NORMALIZED TO THIS SECTOR.
 THE THIRD NUMBER IS THE FREQUENCY WITH RESPECT TO ALL TIME.
0   4.504E-03   2.975E-03   1.746E-03   1.291E-03   4.306E-04   3.003E-04   2.885E-04   1.983E-04   1.801E-04   1.644E-04
       0.021       0.065       0.213       0.386       0.388       2.666      10.587      12.865      13.072      20.061
     0.00093     0.00289     0.00945     0.01714     0.01721     0.11824     0.46956     0.57060     0.57978     0.88977
0   1.164E-04   1.113E-04   1.086E-04   8.688E-05   8.608E-05   6.875E-05   5.550E-05   4.583E-05   4.102E-05   3.004E-05
      24.824      24.828      25.501      44.242      48.073      57.340      72.250      72.716      86.954      88.558
     1.10102     1.10117     1.13102     1.96225     2.13217     2.54319     3.20450     3.22517     3.85663     3.92781
0   2.871E-05   2.735E-05   1.802E-05   1.435E-05   1.202E-05   8.612E-06   7.423E-06   3.711E-06   2.227E-06
      88.766      90.112      90.785      92.131      92.338      93.011      93.891      98.188     100.000
     3.93699     3.99670     4.02655     4.08625     4.09543     4.12528     4.16432     4.35490     4.43527
0          X/Q PERCENTILES
 (BASED ON THE UPPER ENVELOPE OF THE
 ORDERED X/Q-FREQUENCY VALUES, AND AS
 PLOTTED ON A LOG-NORMAL GRAPH.)
0 PERCENT OF TIME CHI/Q IS EQUALED OR EXCEEDED
        CHI/Q      WITH RESPECT TO     WHEN THE WIND BLOWS
 SEC/CUBIC METER  THE TOTAL TIME      INTO THIS SECTOR ONLY

                                                          HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 2)=   0.003
                                                          HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 3)=   0.469
                                                          HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 4)=   2.130
                                                          HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 5)=   3.202
     9.489E-04              0.044              1.000
     5.620E-04              0.133              3.000
     4.331E-04              0.222              5.000
     2.979E-04              0.444             10.000
     2.227E-04              0.665             15.000
     1.785E-04              0.887             20.000
     1.495E-04              1.109             25.000
     1.288E-04              1.331             30.000
     1.132E-04              1.552             35.000
     1.011E-04              1.774             40.000
     9.123E-05              1.996             45.000
     8.261E-05              2.218             50.000
     7.470E-05              2.439             55.000
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     6.805E-05              2.661             60.000
     6.238E-05              2.883             65.000
     5.749E-05              3.105             70.000
0    2.755E-04              0.5               11.27
0ANNUAL AVERAGE =   1.23E-05
1USNRC COMPUTER CODE-PAVAN, VERSION 2.0          RUN DATE: Wed Apr 14 10:41:55 2004

/PLANT NAME: Palisades                           METEOROLOGICAL INSTRUMENTATION
 DATA PERIOD:  1999-2003                         WIND SENSORS HEIGHT: 10 Meters        DT
 TYPE OF RELEASE: Ground Level Release           DELTA-T HEIGHTS: from 10m to 60m
 SOURCE OF DATA: Data from onsite met tower
 COMMENTS: NONE
 PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145
0PARAMETER VALUES FOR THE CHI/Q CALCULATIONS FOR THE  NE SECTOR.
 STABILITY WINDSPEED FREQUENCY DISTANCE TERRAIN HT EFF PLUME HT  SIGMA-Y SIGMA-Z MEANDER-SY  ** CHI/Q VALUES (SEC/CUBIC METER)
   CLASS   METER/SEC  PERCENT   METERS    METERS      METERS      METERS  METERS   METERS        MEANDER   BLDG WAKE        USED
         AT  10.0 METERS                                                                              CA=1006.SQ.METERS

    A         0.1       0.00      677.        0.          0.       131.7   215.2    131.7      1.126E-04   1.113E-04   1.113E-04
    A         1.5       0.51      677.        0.          0.       131.7   215.2    131.7      7.507E-06   7.423E-06   7.423E-06
    A         3.0       6.04      677.        0.          0.       131.7   215.2    131.7      3.753E-06   3.711E-06   3.711E-06
    A         5.0      10.66      677.        0.          0.       131.7   215.2    131.7      2.252E-06   2.227E-06   2.227E-06
    A         7.5       0.78      677.        0.          0.       131.7   215.2    131.7      1.501E-06   1.485E-06   1.485E-06

    B         0.1       0.00      677.        0.          0.        99.0    71.6     99.0      4.500E-04   4.306E-04   4.306E-04
    B         1.5       0.12      677.        0.          0.        99.0    71.6     99.0      3.000E-05   2.871E-05   2.871E-05
    B         3.0       1.84      677.        0.          0.        99.0    71.6     99.0      1.500E-05   1.435E-05   1.435E-05
    B         5.0       2.90      677.        0.          0.        99.0    71.6     99.0      9.000E-06   8.612E-06   8.612E-06
    B         7.5       0.39      677.        0.          0.        99.0    71.6     99.0      6.000E-06   5.741E-06   5.741E-06

    C         0.1       0.00      677.        0.          0.        75.2    42.8     75.2      9.907E-04   9.012E-04   9.012E-04
    C         1.5       0.27      677.        0.          0.        75.2    42.8     75.2      6.605E-05   6.008E-05   6.008E-05
    C         3.0       2.63      677.        0.          0.        75.2    42.8     75.2      3.302E-05   3.004E-05   3.004E-05
    C         5.0       3.17      677.        0.          0.        75.2    42.8     75.2      1.981E-05   1.802E-05   1.802E-05
    C         7.5       0.78      677.        0.          0.        75.2    42.8     75.2      1.321E-05   1.202E-05   1.202E-05

    D         0.1       0.08      677.        0.          0.        53.0    23.3    105.9      1.291E-03   2.051E-03   1.291E-03
    D         1.5       1.84      677.        0.          0.        53.0    23.3    105.9      8.608E-05   1.367E-04   8.608E-05
    D         3.0       9.72      677.        0.          0.        53.0    23.3     82.1      5.550E-05   6.837E-05   5.550E-05
    D         5.0      24.33      677.        0.          0.        53.0    23.3     59.5      4.596E-05   4.102E-05   4.102E-05
    D         7.5       8.15      677.        0.          0.        53.0    23.3     53.0      3.443E-05   2.735E-05   2.735E-05
    D        10.0       0.12      677.        0.          0.        53.0    23.3     53.0      2.582E-05   2.051E-05   2.051E-05

    E         0.1       0.07      677.        0.          0.        37.7    16.2    113.0      1.746E-03   3.437E-03   1.746E-03
    E         1.5       2.23      677.        0.          0.        37.7    16.2    113.0      1.164E-04   2.292E-04   1.164E-04
    E         3.0       7.76      677.        0.          0.        37.7    16.2     75.7      8.688E-05   1.146E-04   8.688E-05
    E         5.0       8.70      677.        0.          0.        37.7    16.2     45.4      8.688E-05   6.875E-05   6.875E-05
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    E         7.5       2.11      677.        0.          0.        37.7    16.2     37.7      6.985E-05   4.583E-05   4.583E-05
    E        10.0       0.12      677.        0.          0.        37.7    16.2     37.7      5.239E-05   3.437E-05   3.437E-05

    F         0.1       0.02      677.        0.          0.        26.0    10.3    104.0      2.975E-03   5.432E-03   2.975E-03
    F         1.5       1.06      677.        0.          0.        26.0    10.3    104.0      1.983E-04   3.621E-04   1.983E-04
    F         3.0       1.84      677.        0.          0.        26.0    10.3     62.7      1.644E-04   1.811E-04   1.644E-04
    F         5.0       0.27      677.        0.          0.        26.0    10.3     32.9      1.879E-04   1.086E-04   1.086E-04

    G         0.1       0.01      677.        0.          0.        17.9     6.6    107.6      4.504E-03   9.007E-03   4.504E-03
    G         1.5       0.66      677.        0.          0.        17.9     6.6    107.6      3.003E-04   6.004E-04   3.003E-04
    G         3.0       0.78      677.        0.          0.        17.9     6.6     56.0      2.885E-04   3.002E-04   2.885E-04
1USNRC COMPUTER CODE-PAVAN, VERSION 2.0          RUN DATE: Wed Apr 14 10:41:55 2004

/PLANT NAME: Palisades                           METEOROLOGICAL INSTRUMENTATION
 DATA PERIOD:  1999-2003                         WIND SENSORS HEIGHT: 10 Meters        DT
 TYPE OF RELEASE: Ground Level Release           DELTA-T HEIGHTS: from 10m to 60m
 SOURCE OF DATA: Data from onsite met tower
 COMMENTS: NONE
 PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145
0SITE EXCLUSION BOUNDARY CALCULATIONS:
0  NE SECTOR     BOUNDARY DISTANCE =  677.0 METERS
0LATERAL PLUME MEANDER/BUILDING WAKE CREDIT ALLOWED
 AS A FUNCTION OF DOWNWIND DISTANCE.
 MEANDER CREDIT IS FOR WINDSPEEDS LESS THAN 6 MPS.
 BUILDING WAKE CREDIT ALLOWED:   C=  0.5     A=  2011.     D=   58.5
 CORRECTION FACTORS USED IN THE ANNUAL AVERAGE CALCULATIONS.
0BELOW ARE PRINTED THE ORDERED VALUES OF CHI/Q AND THE FREQUENCY WITH WHICH THAT VALUE IS REACHED OR EXCEEDED.
 THE TOP NUMBER IS THE CHI/Q.  THE MIDDLE NUMBER IS THE FREQUENCY NORMALIZED TO THIS SECTOR.
 THE THIRD NUMBER IS THE FREQUENCY WITH RESPECT TO ALL TIME.
0   4.504E-03   2.975E-03   1.746E-03   1.291E-03   9.012E-04   4.306E-04   3.003E-04   2.885E-04   1.983E-04   1.644E-04
        0.006       0.027       0.096       0.179       0.183       0.184       0.848       1.633       2.690       4.532
      0.00047     0.00203     0.00730     0.01364     0.01394     0.01401     0.06453     0.12423     0.20460     0.34466
0   1.164E-04   1.113E-04   1.086E-04   8.688E-05   8.608E-05   6.875E-05   6.008E-05   5.550E-05   4.583E-05   4.102E-05
        6.766       6.768       7.040      14.799      16.641      25.336      25.608      35.329      37.443      61.777
      0.51458     0.51473     0.53540     1.12553     1.26560     1.92690     1.94757     2.68695     2.84768     4.69843
0   3.437E-05   3.004E-05   2.871E-05   2.735E-05   2.051E-05   1.802E-05   1.435E-05   1.202E-05   8.612E-06   7.423E-06
       61.898      64.525      64.646      72.797      72.918      76.088      77.930      78.715      81.613      82.127
      4.70762     4.90739     4.91657     5.53655     5.54573     5.78683     5.92690     5.98661     6.20704     6.24608
0   5.741E-06   3.711E-06   2.227E-06   1.485E-06
       82.519      88.557      99.215     100.000
      6.27593     6.73517     7.54573     7.60544
0          X/Q PERCENTILES
 (BASED ON THE UPPER ENVELOPE OF THE
 ORDERED X/Q-FREQUENCY VALUES, AND AS
 PLOTTED ON A LOG-NORMAL GRAPH.)
0 PERCENT OF TIME CHI/Q IS EQUALED OR EXCEEDED
        CHI/Q      WITH RESPECT TO     WHEN THE WIND BLOWS
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 SEC/CUBIC METER  THE TOTAL TIME      INTO THIS SECTOR ONLY

                                                          HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 2)=   0.002
                                                          HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 3)=   0.007
                                                          HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 4)=   0.014
                                                          HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 5)=   0.344
                                                          HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 6)=   1.925
                                                          HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 7)=   4.695
                                                          HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 8)=   5.533
     4.604E-04              0.076              1.000
     2.208E-04              0.228              3.000
     1.571E-04              0.380              5.000
     1.126E-04              0.761             10.000
     9.148E-05              1.141             15.000
     7.841E-05              1.521             20.000
     6.927E-05              1.901             25.000
     6.270E-05              2.282             30.000
     5.752E-05              2.662             35.000
     5.329E-05              3.042             40.000
     4.975E-05              3.422             45.000
     4.672E-05              3.803             50.000
     4.409E-05              4.183             55.000
     4.178E-05              4.563             60.000
     3.623E-05              4.944             65.000
     3.017E-05              5.324             70.000
0    1.381E-04              0.5                6.57
0ANNUAL AVERAGE =   1.10E-05
1USNRC COMPUTER CODE-PAVAN, VERSION 2.0          RUN DATE: Wed Apr 14 10:41:55 2004

/PLANT NAME: Palisades                           METEOROLOGICAL INSTRUMENTATION
 DATA PERIOD:  1999-2003                         WIND SENSORS HEIGHT: 10 Meters        DT
 TYPE OF RELEASE: Ground Level Release           DELTA-T HEIGHTS: from 10m to 60m
 SOURCE OF DATA: Data from onsite met tower
 COMMENTS: NONE
 PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145
0PARAMETER VALUES FOR THE CHI/Q CALCULATIONS FOR THE ENE SECTOR.
 STABILITY WINDSPEED FREQUENCY DISTANCE TERRAIN HT EFF PLUME HT  SIGMA-Y SIGMA-Z MEANDER-SY  ** CHI/Q VALUES (SEC/CUBIC METER)
   CLASS   METER/SEC  PERCENT   METERS    METERS      METERS      METERS  METERS   METERS        MEANDER   BLDG WAKE        USED
         AT  10.0 METERS                                                                                  CA=1006.SQ.METERS

    A         0.1       0.00      677.        0.          0.       131.7   215.2    131.7      1.126E-04   1.113E-04   1.113E-04
    A         1.5       1.13      677.        0.          0.       131.7   215.2    131.7      7.507E-06   7.423E-06   7.423E-06
    A         3.0      15.04      677.        0.          0.       131.7   215.2    131.7      3.753E-06   3.711E-06   3.711E-06
    A         5.0      10.61      677.        0.          0.       131.7   215.2    131.7      2.252E-06   2.227E-06   2.227E-06
    A         7.5       0.62      677.        0.          0.       131.7   215.2    131.7      1.501E-06   1.485E-06   1.485E-06

    B         0.1       0.01      677.        0.          0.        99.0    71.6     99.0      4.500E-04   4.306E-04   4.306E-04
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B	1.5	0.80	677.	0.	0.	99.0	71.6	99.0	3.000E-05	2.871E-05	2.871E-05
B	3.0	1.74	677.	0.	0.	99.0	71.6	99.0	1.500E-05	1.435E-05	1.435E-05
B	5.0	2.54	677.	0.	0.	99.0	71.6	99.0	9.000E-06	8.612E-06	8.612E-06
B	7.5	0.15	677.	0.	0.	99.0	71.6	99.0	6.000E-06	5.741E-06	5.741E-06
C	0.1	0.01	677.	0.	0.	75.2	42.8	75.2	9.907E-04	9.012E-04	9.012E-04
C	1.5	0.47	677.	0.	0.	75.2	42.8	75.2	6.605E-05	6.008E-05	6.008E-05
C	3.0	1.42	677.	0.	0.	75.2	42.8	75.2	3.302E-05	3.004E-05	3.004E-05
C	5.0	2.22	677.	0.	0.	75.2	42.8	75.2	1.981E-05	1.802E-05	1.802E-05
C	7.5	0.47	677.	0.	0.	75.2	42.8	75.2	1.321E-05	1.202E-05	1.202E-05
D	0.1	0.14	677.	0.	0.	53.0	23.3	105.9	1.291E-03	2.051E-03	1.291E-03
D	1.5	3.16	677.	0.	0.	53.0	23.3	105.9	8.608E-05	1.367E-04	8.608E-05
D	3.0	7.45	677.	0.	0.	53.0	23.3	82.1	5.550E-05	6.837E-05	5.550E-05
D	5.0	16.46	677.	0.	0.	53.0	23.3	59.5	4.596E-05	4.102E-05	4.102E-05
D	7.5	9.81	677.	0.	0.	53.0	23.3	53.0	3.443E-05	2.735E-05	2.735E-05
D	10.0	1.13	677.	0.	0.	53.0	23.3	53.0	2.582E-05	2.051E-05	2.051E-05
E	0.1	0.06	677.	0.	0.	37.7	16.2	113.0	1.746E-03	3.437E-03	1.746E-03
E	1.5	2.07	677.	0.	0.	37.7	16.2	113.0	1.164E-04	2.292E-04	1.164E-04
E	3.0	8.07	677.	0.	0.	37.7	16.2	75.7	8.688E-05	1.146E-04	8.688E-05
E	5.0	7.59	677.	0.	0.	37.7	16.2	45.4	8.688E-05	6.875E-05	6.875E-05
E	7.5	2.69	677.	0.	0.	37.7	16.2	37.7	6.985E-05	4.583E-05	4.583E-05
E	10.0	0.15	677.	0.	0.	37.7	16.2	37.7	5.239E-05	3.437E-05	3.437E-05
F	0.1	0.02	677.	0.	0.	26.0	10.3	104.0	2.975E-03	5.432E-03	2.975E-03
F	1.5	1.27	677.	0.	0.	26.0	10.3	104.0	1.983E-04	3.621E-04	1.983E-04
F	3.0	1.74	677.	0.	0.	26.0	10.3	62.7	1.644E-04	1.811E-04	1.644E-04
F	5.0	0.33	677.	0.	0.	26.0	10.3	32.9	1.879E-04	1.086E-04	1.086E-04
F	7.5	0.15	677.	0.	0.	26.0	10.3	26.0	1.586E-04	7.243E-05	7.243E-05
G	0.1	0.00	677.	0.	0.	17.9	6.6	107.6	4.504E-03	9.007E-03	4.504E-03
G	1.5	0.33	677.	0.	0.	17.9	6.6	107.6	3.003E-04	6.004E-04	3.003E-04
G	3.0	0.15	677.	0.	0.	17.9	6.6	56.0	2.885E-04	3.002E-04	2.885E-04

1USNRC COMPUTER CODE-PAVAN, VERSION 2.0 RUN DATE: Wed Apr 14 10:41:55 2004

/PLANT NAME: Palisades METEOROLOGICAL INSTRUMENTATION
DATA PERIOD: 1999-2003 WIND SENSORS HEIGHT: 10 Meters DT
TYPE OF RELEASE: Ground Level Release DELTA-T HEIGHTS: from 10m to 60m
SOURCE OF DATA: Data from onsite met tower
COMMENTS: NONE
PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145
0SITE EXCLUSION BOUNDARY CALCULATIONS:
0 ENE SECTOR BOUNDARY DISTANCE = 677.0 METERS
0LATERAL PLUME MEANDER/BUILDING WAKE CREDIT ALLOWED
AS A FUNCTION OF DOWNWIND DISTANCE.
MEANDER CREDIT IS FOR WINDSPEEDS LESS THAN 6 MPS.

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 BUILDING WAKE CREDIT ALLOWED:   C=  0.5     A=  2011.     D=   58.5
 CORRECTION FACTORS USED IN THE ANNUAL AVERAGE CALCULATIONS.
0BELOW ARE PRINTED THE ORDERED VALUES OF CHI/Q AND THE FREQUENCY WITH WHICH THAT VALUE IS REACHED OR EXCEEDED.
 THE TOP NUMBER IS THE CHI/Q.  THE MIDDLE NUMBER IS THE FREQUENCY NORMALIZED TO THIS SECTOR.
 THE THIRD NUMBER IS THE FREQUENCY WITH RESPECT TO ALL TIME.
0   4.504E-03   2.975E-03   1.746E-03   1.291E-03   9.012E-04   4.306E-04   3.003E-04   2.885E-04   1.983E-04   1.644E-04
        0.003       0.028       0.092       0.235       0.242       0.248       0.575       0.721       1.992       3.737
      0.00019     0.00175     0.00582     0.01485     0.01528     0.01569     0.03635     0.04554     0.12590     0.23612
0   1.164E-04   1.113E-04   1.086E-04   8.688E-05   8.608E-05   7.243E-05   6.875E-05   6.008E-05   5.550E-05   4.583E-05
        5.808       5.812       6.139      14.206      17.368      17.513      25.108      25.580      33.029      35.718
      0.36701     0.36728     0.38795     0.89771     1.09748     1.10666     1.58657     1.61642     2.08714     2.25706
0   4.102E-05   3.437E-05   3.004E-05   2.871E-05   2.735E-05   2.051E-05   1.802E-05   1.435E-05   1.202E-05   8.612E-06
       52.179      52.325      53.742      54.541      64.353      65.479      67.696      69.440      69.912      72.456
      3.29725     3.30643     3.39598     3.44650     4.06648     4.13766     4.27773     4.38795     4.41780     4.57853
0   7.423E-06   5.741E-06   3.711E-06   2.227E-06   1.485E-06
       73.582      73.728      88.772      99.382     100.000
      4.64971     4.65890     5.60953     6.28002     6.31906
0          X/Q PERCENTILES
 (BASED ON THE UPPER ENVELOPE OF THE
 ORDERED X/Q-FREQUENCY VALUES, AND AS
 PLOTTED ON A LOG-NORMAL GRAPH.)
0 PERCENT OF TIME CHI/Q IS EQUALED OR EXCEEDED
        CHI/Q      WITH RESPECT TO     WHEN THE WIND BLOWS
 SEC/CUBIC METER  THE TOTAL TIME      INTO THIS SECTOR ONLY

                                                          HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 3)=   0.015
                                                          HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 4)=   0.367
                                                          HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 6)=   1.585
                                                          HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 7)=   3.294
                                                          HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 8)=   4.063
     4.696E-04              0.063              1.000
     2.017E-04              0.190              3.000
     1.323E-04              0.316              5.000
     1.007E-04              0.632             10.000
     8.984E-05              0.948             15.000
     7.908E-05              1.264             20.000
     6.893E-05              1.580             25.000
     6.095E-05              1.896             30.000
     5.478E-05              2.212             35.000
     4.984E-05              2.528             40.000
     4.577E-05              2.844             45.000
     4.235E-05              3.160             50.000
     3.711E-05              3.475             55.000
     3.137E-05              3.791             60.000
0    1.073E-04              0.5                7.91
0ANNUAL AVERAGE =   8.90E-06
1USNRC COMPUTER CODE-PAVAN, VERSION 2.0          RUN DATE: Wed Apr 14 10:41:55 2004
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/PLANT NAME: Palisades METEOROLOGICAL INSTRUMENTATION
DATA PERIOD: 1999-2003 WIND SENSORS HEIGHT: 10 Meters DT
TYPE OF RELEASE: Ground Level Release DELTA-T HEIGHTS: from 10m to 60m
SOURCE OF DATA: Data from onsite met tower
COMMENTS: NONE
PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145
0PARAMETER VALUES FOR THE CHI/Q CALCULATIONS FOR THE E SECTOR.

STABILITY CLASS	WINDSPEED AT 10.0 METERS METER/SEC	FREQUENCY PERCENT	DISTANCE METERS	TERRAIN HT METERS	EFF PLUME HT METERS	SIGMA-Y METERS	SIGMA-Z METERS	MEANDER-SY METERS	** CHI/Q VALUES (SEC/CUBIC METER) MEANDER	BLDG WAKE CA=1006.SQ.METERS	USED
A	0.1	0.01	677.	0.	0.	131.7	215.2	131.7	1.126E-04	1.113E-04	1.113E-04
A	1.5	2.39	677.	0.	0.	131.7	215.2	131.7	7.507E-06	7.423E-06	7.423E-06
A	3.0	13.79	677.	0.	0.	131.7	215.2	131.7	3.753E-06	3.711E-06	3.711E-06
A	5.0	4.82	677.	0.	0.	131.7	215.2	131.7	2.252E-06	2.227E-06	2.227E-06
A	7.5	0.48	677.	0.	0.	131.7	215.2	131.7	1.501E-06	1.485E-06	1.485E-06
B	0.1	0.00	677.	0.	0.	99.0	71.6	99.0	4.500E-04	4.306E-04	4.306E-04
B	1.5	0.62	677.	0.	0.	99.0	71.6	99.0	3.000E-05	2.871E-05	2.871E-05
B	3.0	1.29	677.	0.	0.	99.0	71.6	99.0	1.500E-05	1.435E-05	1.435E-05
B	5.0	0.81	677.	0.	0.	99.0	71.6	99.0	9.000E-06	8.612E-06	8.612E-06
B	7.5	0.33	677.	0.	0.	99.0	71.6	99.0	6.000E-06	5.741E-06	5.741E-06
C	0.1	0.01	677.	0.	0.	75.2	42.8	75.2	9.907E-04	9.012E-04	9.012E-04
C	1.5	0.48	677.	0.	0.	75.2	42.8	75.2	6.605E-05	6.008E-05	6.008E-05
C	3.0	1.43	677.	0.	0.	75.2	42.8	75.2	3.302E-05	3.004E-05	3.004E-05
C	5.0	1.29	677.	0.	0.	75.2	42.8	75.2	1.981E-05	1.802E-05	1.802E-05
C	7.5	0.33	677.	0.	0.	75.2	42.8	75.2	1.321E-05	1.202E-05	1.202E-05
D	0.1	0.09	677.	0.	0.	53.0	23.3	105.9	1.291E-03	2.051E-03	1.291E-03
D	1.5	1.91	677.	0.	0.	53.0	23.3	105.9	8.608E-05	1.367E-04	8.608E-05
D	3.0	7.35	677.	0.	0.	53.0	23.3	82.1	5.550E-05	6.837E-05	5.550E-05
D	5.0	20.18	677.	0.	0.	53.0	23.3	59.5	4.596E-05	4.102E-05	4.102E-05
D	7.5	16.84	677.	0.	0.	53.0	23.3	53.0	3.443E-05	2.735E-05	2.735E-05
D	10.0	3.68	677.	0.	0.	53.0	23.3	53.0	2.582E-05	2.051E-05	2.051E-05
D	15.0	0.48	677.	0.	0.	53.0	23.3	53.0	1.722E-05	1.367E-05	1.367E-05
E	0.1	0.07	677.	0.	0.	37.7	16.2	113.0	1.746E-03	3.437E-03	1.746E-03
E	1.5	2.10	677.	0.	0.	37.7	16.2	113.0	1.164E-04	2.292E-04	1.164E-04
E	3.0	5.92	677.	0.	0.	37.7	16.2	75.7	8.688E-05	1.146E-04	8.688E-05
E	5.0	6.87	677.	0.	0.	37.7	16.2	45.4	8.688E-05	6.875E-05	6.875E-05
E	7.5	2.10	677.	0.	0.	37.7	16.2	37.7	6.985E-05	4.583E-05	4.583E-05
E	10.0	0.33	677.	0.	0.	37.7	16.2	37.7	5.239E-05	3.437E-05	3.437E-05
F	0.1	0.02	677.	0.	0.	26.0	10.3	104.0	2.975E-03	5.432E-03	2.975E-03
F	1.5	0.96	677.	0.	0.	26.0	10.3	104.0	1.983E-04	3.621E-04	1.983E-04

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    F         3.0       0.96      677.        0.          0.        26.0    10.3     62.7      1.644E-04   1.811E-04   1.644E-04
    F         5.0       0.96      677.        0.          0.        26.0    10.3     32.9      1.879E-04   1.086E-04   1.086E-04
    F         7.5       0.33      677.        0.          0.        26.0    10.3     26.0      1.586E-04   7.243E-05   7.243E-05

    G         0.1       0.00      677.        0.          0.        17.9     6.6    107.6      4.504E-03   9.007E-03   4.504E-03
    G         1.5       0.33      677.        0.          0.        17.9     6.6    107.6      3.003E-04   6.004E-04   3.003E-04
    G         3.0       0.48      677.        0.          0.        17.9     6.6     56.0      2.885E-04   3.002E-04   2.885E-04
1USNRC COMPUTER CODE-PAVAN, VERSION 2.0          RUN DATE: Wed Apr 14 10:41:55 2004

/PLANT NAME: Palisades                           METEOROLOGICAL INSTRUMENTATION
 DATA PERIOD:  1999-2003                         WIND SENSORS HEIGHT: 10 Meters        DT
 TYPE OF RELEASE: Ground Level Release           DELTA-T HEIGHTS: from 10m to 60m
 SOURCE OF DATA: Data from onsite met tower
 COMMENTS: NONE
 PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145
0SITE EXCLUSION BOUNDARY CALCULATIONS:
0   E SECTOR     BOUNDARY DISTANCE =  677.0 METERS
0LATERAL PLUME MEANDER/BUILDING WAKE CREDIT ALLOWED
 AS A FUNCTION OF DOWNWIND DISTANCE.
 MEANDER CREDIT IS FOR WINDSPEEDS LESS THAN 6 MPS.
 BUILDING WAKE CREDIT ALLOWED:   C=  0.5     A=  2011.     D=   58.5
 CORRECTION FACTORS USED IN THE ANNUAL AVERAGE CALCULATIONS.
0BELOW ARE PRINTED THE ORDERED VALUES OF CHI/Q AND THE FREQUENCY WITH WHICH THAT VALUE IS REACHED OR EXCEEDED.
 THE TOP NUMBER IS THE CHI/Q.  THE MIDDLE NUMBER IS THE FREQUENCY NORMALIZED TO THIS SECTOR.
 THE THIRD NUMBER IS THE FREQUENCY WITH RESPECT TO ALL TIME.
0   4.504E-03   2.975E-03   1.746E-03   1.291E-03   9.012E-04   4.306E-04   3.003E-04   2.885E-04   1.983E-04   1.644E-04
        0.003       0.022       0.087       0.173       0.180       0.185       0.516       0.994       1.950       2.905
      0.00019     0.00135     0.00541     0.01081     0.01125     0.01156     0.03222     0.06208     0.12178     0.18148
0   1.164E-04   1.113E-04   1.086E-04   8.688E-05   8.608E-05   7.243E-05   6.875E-05   6.008E-05   5.550E-05   4.583E-05
        5.001       5.010       5.966      11.884      13.796      14.127      21.001      21.479      28.831      30.926
      0.31236     0.31294     0.37264     0.74233     0.86173     0.88240     1.31179     1.34164     1.80088     1.93177
0   4.102E-05   3.437E-05   3.004E-05   2.871E-05   2.735E-05   2.051E-05   1.802E-05   1.435E-05   1.367E-05   1.202E-05
       51.108      51.439      52.873      53.498      70.334      74.010      75.297      76.583      77.061      77.392
      3.19239     3.21305     3.30261     3.34164     4.39331     4.62293     4.70329     4.78366     4.81351     4.83418
0   8.612E-06   7.423E-06   5.741E-06   3.711E-06   2.227E-06   1.485E-06
       78.201      80.590      80.921      94.706      99.522     100.000
      4.88470     5.03395     5.05462     5.91569     6.21650     6.24635
0          X/Q PERCENTILES
 (BASED ON THE UPPER ENVELOPE OF THE
 ORDERED X/Q-FREQUENCY VALUES, AND AS
 PLOTTED ON A LOG-NORMAL GRAPH.)
0 PERCENT OF TIME CHI/Q IS EQUALED OR EXCEEDED
        CHI/Q      WITH RESPECT TO     WHEN THE WIND BLOWS
 SEC/CUBIC METER  THE TOTAL TIME      INTO THIS SECTOR ONLY

                                                 HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 3)=   0.005
                                                 HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 4)=   0.011
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                                                    HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 5)=   0.372
                                                    HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 7)=   3.189
                                                    HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 8)=   4.390
     4.124E-04              0.062              1.000
     1.862E-04              0.187              3.000
     1.252E-04              0.312              5.000
     9.437E-05              0.625             10.000
     8.242E-05              0.937             15.000
     7.073E-05              1.249             20.000
     6.256E-05              1.562             25.000
     5.643E-05              1.874             30.000
     5.160E-05              2.186             35.000
     4.766E-05              2.499             40.000
     4.438E-05              2.811             45.000
     4.159E-05              3.123             50.000
     3.745E-05              3.435             55.000
     3.356E-05              3.748             60.000
     3.030E-05              4.060             65.000
     2.752E-05              4.372             70.000
0    1.004E-04              0.5                8.00
0ANNUAL AVERAGE =   8.09E-06
1USNRC COMPUTER CODE-PAVAN, VERSION 2.0          RUN DATE: Wed Apr 14 10:41:55 2004

/PLANT NAME: Palisades                           METEOROLOGICAL INSTRUMENTATION
 DATA PERIOD:  1999-2003                         WIND SENSORS HEIGHT: 10 Meters        DT
 TYPE OF RELEASE: Ground Level Release           DELTA-T HEIGHTS: from 10m to 60m
 SOURCE OF DATA: Data from onsite met tower
 COMMENTS: NONE
 PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145
0PARAMETER VALUES FOR THE CHI/Q CALCULATIONS FOR THE ESE SECTOR.
 STABILITY WINDSPEED FREQUENCY DISTANCE TERRAIN HT EFF PLUME HT  SIGMA-Y SIGMA-Z MEANDER-SY  ** CHI/Q VALUES (SEC/CUBIC METER)
   CLASS   METER/SEC  PERCENT   METERS    METERS      METERS      METERS  METERS   METERS        MEANDER   BLDG WAKE        USED
         AT  10.0 METERS                                                                                  CA=1006.SQ.METERS

    A         0.1       0.01      677.        0.          0.       131.7   215.2    131.7      1.126E-04   1.113E-04   1.113E-04
    A         1.5       2.74      677.        0.          0.       131.7   215.2    131.7      7.507E-06   7.423E-06   7.423E-06
    A         3.0      16.55      677.        0.          0.       131.7   215.2    131.7      3.753E-06   3.711E-06   3.711E-06
    A         5.0       3.90      677.        0.          0.       131.7   215.2    131.7      2.252E-06   2.227E-06   2.227E-06
    A         7.5       0.56      677.        0.          0.       131.7   215.2    131.7      1.501E-06   1.485E-06   1.485E-06

    B         0.1       0.01      677.        0.          0.        99.0    71.6     99.0      4.500E-04   4.306E-04   4.306E-04
    B         1.5       0.73      677.        0.          0.        99.0    71.6     99.0      3.000E-05   2.871E-05   2.871E-05
    B         3.0       1.02      677.        0.          0.        99.0    71.6     99.0      1.500E-05   1.435E-05   1.435E-05
    B         5.0       1.29      677.        0.          0.        99.0    71.6     99.0      9.000E-06   8.612E-06   8.612E-06
    B         7.5       0.30      677.        0.          0.        99.0    71.6     99.0      6.000E-06   5.741E-06   5.741E-06

    C         0.1       0.01      677.        0.          0.        75.2    42.8     75.2      9.907E-04   9.012E-04   9.012E-04
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    C         1.5       0.43      677.        0.          0.        75.2    42.8     75.2      6.605E-05   6.008E-05   6.008E-05
    C         3.0       1.16      677.        0.          0.        75.2    42.8     75.2      3.302E-05   3.004E-05   3.004E-05
    C         5.0       2.01      677.        0.          0.        75.2    42.8     75.2      1.981E-05   1.802E-05   1.802E-05
    C         7.5       0.73      677.        0.          0.        75.2    42.8     75.2      1.321E-05   1.202E-05   1.202E-05

    D         0.1       0.09      677.        0.          0.        53.0    23.3    105.9      1.291E-03   2.051E-03   1.291E-03
    D         1.5       2.01      677.        0.          0.        53.0    23.3    105.9      8.608E-05   1.367E-04   8.608E-05
    D         3.0       7.50      677.        0.          0.        53.0    23.3     82.1      5.550E-05   6.837E-05   5.550E-05
    D         5.0      25.33      677.        0.          0.        53.0    23.3     59.5      4.596E-05   4.102E-05   4.102E-05
    D         7.5      15.69      677.        0.          0.        53.0    23.3     53.0      3.443E-05   2.735E-05   2.735E-05
    D        10.0       1.29      677.        0.          0.        53.0    23.3     53.0      2.582E-05   2.051E-05   2.051E-05
    D        15.0       0.13      677.        0.          0.        53.0    23.3     53.0      1.722E-05   1.367E-05   1.367E-05

    E         0.1       0.06      677.        0.          0.        37.7    16.2    113.0      1.746E-03   3.437E-03   1.746E-03
    E         1.5       1.88      677.        0.          0.        37.7    16.2    113.0      1.164E-04   2.292E-04   1.164E-04
    E         3.0       5.48      677.        0.          0.        37.7    16.2     75.7      8.688E-05   1.146E-04   8.688E-05
    E         5.0       4.89      677.        0.          0.        37.7    16.2     45.4      8.688E-05   6.875E-05   6.875E-05
    E         7.5       1.29      677.        0.          0.        37.7    16.2     37.7      6.985E-05   4.583E-05   4.583E-05

    F         0.1       0.01      677.        0.          0.        26.0    10.3    104.0      2.975E-03   5.432E-03   2.975E-03
    F         1.5       0.73      677.        0.          0.        26.0    10.3    104.0      1.983E-04   3.621E-04   1.983E-04
    F         3.0       1.02      677.        0.          0.        26.0    10.3     62.7      1.644E-04   1.811E-04   1.644E-04
    F         5.0       0.30      677.        0.          0.        26.0    10.3     32.9      1.879E-04   1.086E-04   1.086E-04

    G         0.1       0.01      677.        0.          0.        17.9     6.6    107.6      4.504E-03   9.007E-03   4.504E-03
    G         1.5       0.56      677.        0.          0.        17.9     6.6    107.6      3.003E-04   6.004E-04   3.003E-04
    G         3.0       0.30      677.        0.          0.        17.9     6.6     56.0      2.885E-04   3.002E-04   2.885E-04
1USNRC COMPUTER CODE-PAVAN, VERSION 2.0          RUN DATE: Wed Apr 14 10:41:55 2004

/PLANT NAME: Palisades                           METEOROLOGICAL INSTRUMENTATION
 DATA PERIOD:  1999-2003                         WIND SENSORS HEIGHT: 10 Meters        DT
 TYPE OF RELEASE: Ground Level Release           DELTA-T HEIGHTS: from 10m to 60m
 SOURCE OF DATA: Data from onsite met tower
 COMMENTS: NONE
 PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145
0SITE EXCLUSION BOUNDARY CALCULATIONS:
0 ESE SECTOR     BOUNDARY DISTANCE =  677.0 METERS
0LATERAL PLUME MEANDER/BUILDING WAKE CREDIT ALLOWED
 AS A FUNCTION OF DOWNWIND DISTANCE.
 MEANDER CREDIT IS FOR WINDSPEEDS LESS THAN 6 MPS.
 BUILDING WAKE CREDIT ALLOWED:   C=  0.5     A=  2011.     D=   58.5
 CORRECTION FACTORS USED IN THE ANNUAL AVERAGE CALCULATIONS.
0BELOW ARE PRINTED THE ORDERED VALUES OF CHI/Q AND THE FREQUENCY WITH WHICH THAT VALUE IS REACHED OR EXCEEDED.
 THE TOP NUMBER IS THE CHI/Q.  THE MIDDLE NUMBER IS THE FREQUENCY NORMALIZED TO THIS SECTOR.
 THE THIRD NUMBER IS THE FREQUENCY WITH RESPECT TO ALL TIME.
0   4.504E-03   2.975E-03   1.746E-03   1.291E-03   9.012E-04   4.306E-04   3.003E-04   2.885E-04   1.983E-04   1.644E-04
        0.005       0.019       0.078       0.169       0.175       0.181       0.742       1.040       1.766       2.790
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      0.00036     0.00134     0.00541     0.01174     0.01217     0.01258     0.05161     0.07228     0.12279     0.19398
0   1.164E-04   1.113E-04   1.086E-04   8.688E-05   8.608E-05   6.875E-05   6.008E-05   5.550E-05   4.583E-05   4.102E-05
        4.673       4.683       4.980      10.463      12.478      17.366      17.795      25.292      26.580      51.912
      0.32486     0.32560     0.34626     0.72743     0.86750     1.20734     1.23719     1.75843     1.84798     3.60918
0   3.004E-05   2.871E-05   2.735E-05   2.051E-05   1.802E-05   1.435E-05   1.367E-05   1.202E-05   8.612E-06   7.423E-06
       53.068      53.795      69.483      70.771      72.785      73.809      73.941      74.668      75.956      78.697
      3.68955     3.74006     4.83076     4.92032     5.06038     5.13157     5.14075     5.19127     5.28082     5.47141
0   5.741E-06   3.711E-06   2.227E-06   1.485E-06
       78.995      95.541      99.439     100.000
      5.49207     6.64247     6.91343     6.95246
0          X/Q PERCENTILES
 (BASED ON THE UPPER ENVELOPE OF THE
 ORDERED X/Q-FREQUENCY VALUES, AND AS
 PLOTTED ON A LOG-NORMAL GRAPH.)
0 PERCENT OF TIME CHI/Q IS EQUALED OR EXCEEDED
        CHI/Q      WITH RESPECT TO     WHEN THE WIND BLOWS
 SEC/CUBIC METER  THE TOTAL TIME      INTO THIS SECTOR ONLY

                                                          HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 2)=   0.001
                                                          HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 3)=   0.012
                                                          HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 4)=   0.324
                                                          HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 6)=   3.606
                                                          HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 7)=   4.827
     3.845E-04              0.070              1.000
     1.669E-04              0.209              3.000
     1.141E-04              0.348              5.000
     9.241E-05              0.695             10.000
     7.887E-05              1.043             15.000
     6.849E-05              1.390             20.000
     6.116E-05              1.738             25.000
     5.560E-05              2.086             30.000
     5.118E-05              2.433             35.000
     4.757E-05              2.781             40.000
     4.453E-05              3.129             45.000
     4.192E-05              3.476             50.000
     3.792E-05              3.824             55.000
     3.363E-05              4.171             60.000
     3.007E-05              4.519             65.000
0    1.024E-04              0.5                7.19
0ANNUAL AVERAGE =   8.91E-06
1USNRC COMPUTER CODE-PAVAN, VERSION 2.0          RUN DATE: Wed Apr 14 10:41:55 2004

/PLANT NAME: Palisades                           METEOROLOGICAL INSTRUMENTATION
 DATA PERIOD:  1999-2003                         WIND SENSORS HEIGHT: 10 Meters        DT
 TYPE OF RELEASE: Ground Level Release           DELTA-T HEIGHTS: from 10m to 60m
 SOURCE OF DATA: Data from onsite met tower
 COMMENTS: NONE
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PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145
0PARAMETER VALUES FOR THE CHI/Q CALCULATIONS FOR THE SE SECTOR.

STABILITY CLASS	WINDSPEED AT 10.0 METERS METER/SEC	FREQUENCY PERCENT	DISTANCE METERS	TERRAIN HT METERS	EFF PLUME HT METERS	SIGMA-Y METERS	SIGMA-Z METERS	MEANDER-SY METERS	** CHI/Q VALUES (SEC/CUBIC METER) MEANDER	BLDG WAKE CA=1006.SQ.METERS	USED
A	0.1	0.01	677.	0.	0.	131.7	215.2	131.7	1.126E-04	1.113E-04	1.113E-04
A	1.5	3.12	677.	0.	0.	131.7	215.2	131.7	7.507E-06	7.423E-06	7.423E-06
A	3.0	18.57	677.	0.	0.	131.7	215.2	131.7	3.753E-06	3.711E-06	3.711E-06
A	5.0	7.14	677.	0.	0.	131.7	215.2	131.7	2.252E-06	2.227E-06	2.227E-06
A	7.5	0.69	677.	0.	0.	131.7	215.2	131.7	1.501E-06	1.485E-06	1.485E-06
B	0.1	0.00	677.	0.	0.	99.0	71.6	99.0	4.500E-04	4.306E-04	4.306E-04
B	1.5	0.34	677.	0.	0.	99.0	71.6	99.0	3.000E-05	2.871E-05	2.871E-05
B	3.0	1.61	677.	0.	0.	99.0	71.6	99.0	1.500E-05	1.435E-05	1.435E-05
B	5.0	1.51	677.	0.	0.	99.0	71.6	99.0	9.000E-06	8.612E-06	8.612E-06
B	7.5	0.45	677.	0.	0.	99.0	71.6	99.0	6.000E-06	5.741E-06	5.741E-06
C	0.1	0.01	677.	0.	0.	75.2	42.8	75.2	9.907E-04	9.012E-04	9.012E-04
C	1.5	0.69	677.	0.	0.	75.2	42.8	75.2	6.605E-05	6.008E-05	6.008E-05
C	3.0	1.51	677.	0.	0.	75.2	42.8	75.2	3.302E-05	3.004E-05	3.004E-05
C	5.0	1.85	677.	0.	0.	75.2	42.8	75.2	1.981E-05	1.802E-05	1.802E-05
C	7.5	0.93	677.	0.	0.	75.2	42.8	75.2	1.321E-05	1.202E-05	1.202E-05
D	0.1	0.13	677.	0.	0.	53.0	23.3	105.9	1.291E-03	2.051E-03	1.291E-03
D	1.5	2.88	677.	0.	0.	53.0	23.3	105.9	8.608E-05	1.367E-04	8.608E-05
D	3.0	7.38	677.	0.	0.	53.0	23.3	82.1	5.550E-05	6.837E-05	5.550E-05
D	5.0	16.82	677.	0.	0.	53.0	23.3	59.5	4.596E-05	4.102E-05	4.102E-05
D	7.5	16.37	677.	0.	0.	53.0	23.3	53.0	3.443E-05	2.735E-05	2.735E-05
D	10.0	3.57	677.	0.	0.	53.0	23.3	53.0	2.582E-05	2.051E-05	2.051E-05
D	15.0	0.34	677.	0.	0.	53.0	23.3	53.0	1.722E-05	1.367E-05	1.367E-05
E	0.1	0.09	677.	0.	0.	37.7	16.2	113.0	1.746E-03	3.437E-03	1.746E-03
E	1.5	2.78	677.	0.	0.	37.7	16.2	113.0	1.164E-04	2.292E-04	1.164E-04
E	3.0	4.73	677.	0.	0.	37.7	16.2	75.7	8.688E-05	1.146E-04	8.688E-05
E	5.0	3.23	677.	0.	0.	37.7	16.2	45.4	8.688E-05	6.875E-05	6.875E-05
E	7.5	0.93	677.	0.	0.	37.7	16.2	37.7	6.985E-05	4.583E-05	4.583E-05
F	0.1	0.02	677.	0.	0.	26.0	10.3	104.0	2.975E-03	5.432E-03	2.975E-03
F	1.5	1.03	677.	0.	0.	26.0	10.3	104.0	1.983E-04	3.621E-04	1.983E-04
F	3.0	0.58	677.	0.	0.	26.0	10.3	62.7	1.644E-04	1.811E-04	1.644E-04
F	5.0	0.11	677.	0.	0.	26.0	10.3	32.9	1.879E-04	1.086E-04	1.086E-04
G	0.1	0.00	677.	0.	0.	17.9	6.6	107.6	4.504E-03	9.007E-03	4.504E-03
G	1.5	0.24	677.	0.	0.	17.9	6.6	107.6	3.003E-04	6.004E-04	3.003E-04
G	3.0	0.34	677.	0.	0.	17.9	6.6	56.0	2.885E-04	3.002E-04	2.885E-04

1USNRC COMPUTER CODE-PAVAN, VERSION 2.0 RUN DATE: Wed Apr 14 10:41:55 2004

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/PLANT NAME: Palisades                          METEOROLOGICAL INSTRUMENTATION
 DATA PERIOD:  1999-2003                        WIND SENSORS HEIGHT: 10 Meters       DT
 TYPE OF RELEASE: Ground Level Release          DELTA-T HEIGHTS: from 10m to 60m
 SOURCE OF DATA: Data from onsite met tower
 COMMENTS: NONE
 PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145
0SITE EXCLUSION BOUNDARY CALCULATIONS:
0  SE SECTOR     BOUNDARY DISTANCE =  677.0 METERS
0LATERAL PLUME MEANDER/BUILDING WAKE CREDIT ALLOWED
 AS A FUNCTION OF DOWNWIND DISTANCE.
 MEANDER CREDIT IS FOR WINDSPEEDS LESS THAN 6 MPS.
 BUILDING WAKE CREDIT ALLOWED:   C=  0.5     A=  2011.     D=   58.5
 CORRECTION FACTORS USED IN THE ANNUAL AVERAGE CALCULATIONS.
0BELOW ARE PRINTED THE ORDERED VALUES OF CHI/Q AND THE FREQUENCY WITH WHICH THAT VALUE IS REACHED OR EXCEEDED.
 THE TOP NUMBER IS THE CHI/Q.  THE MIDDLE NUMBER IS THE FREQUENCY NORMALIZED TO THIS SECTOR.
 THE THIRD NUMBER IS THE FREQUENCY WITH RESPECT TO ALL TIME.
0   4.504E-03   2.975E-03   1.746E-03   1.291E-03   9.012E-04   4.306E-04   3.003E-04   2.885E-04   1.983E-04   1.644E-04
        0.002       0.022       0.108       0.239       0.249       0.252       0.490       0.833       1.865       2.447
      0.00019     0.00193     0.00942     0.02073     0.02160     0.02184     0.04250     0.07236     0.16191     0.21242
0   1.164E-04   1.113E-04   1.086E-04   8.688E-05   8.608E-05   6.875E-05   6.008E-05   5.550E-05   4.583E-05   4.102E-05
        5.224       5.236       5.342      10.076      12.959      16.185      16.873      24.252      25.178      41.999
      0.45353     0.45457     0.46376     0.87478     1.12507     1.40520     1.46491     2.10555     2.18592     3.64631
0   3.004E-05   2.871E-05   2.735E-05   2.051E-05   1.802E-05   1.435E-05   1.367E-05   1.202E-05   8.612E-06   7.423E-06
       43.506      43.850      60.222      63.792      65.644      67.257      67.601      68.527      70.034      73.155
      3.77719     3.80704     5.22840     5.53838     5.69912     5.83919     5.86904     5.94941     6.08029     6.35124
0   5.741E-06   3.711E-06   2.227E-06   1.485E-06
       73.605      92.171      99.312     100.000
      6.39028     8.00222     8.62220     8.68190
0          X/Q PERCENTILES
 (BASED ON THE UPPER ENVELOPE OF THE
 ORDERED X/Q-FREQUENCY VALUES, AND AS
 PLOTTED ON A LOG-NORMAL GRAPH.)
0 PERCENT OF TIME CHI/Q IS EQUALED OR EXCEEDED
        CHI/Q      WITH RESPECT TO     WHEN THE WIND BLOWS
 SEC/CUBIC METER  THE TOTAL TIME      INTO THIS SECTOR ONLY

                                                          HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 3)=   0.009
                                                          HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 4)=   0.021
                                                          HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 5)=   0.453
                                                          HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 7)=   3.643
                                                          HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 8)=   5.225
     4.559E-04              0.087              1.000
     1.885E-04              0.260              3.000
     1.211E-04              0.434              5.000
     9.414E-05              0.868             10.000
     7.904E-05              1.302             15.000
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     6.648E-05              1.736             20.000
     5.784E-05              2.170             25.000
     5.144E-05              2.605             30.000
     4.645E-05              3.039             35.000
     4.243E-05              3.473             40.000
     3.804E-05              3.907             45.000
     3.383E-05              4.341             50.000
     3.037E-05              4.775             55.000
     2.747E-05              5.209             60.000
0    1.129E-04              0.5                5.76
0ANNUAL AVERAGE =   1.14E-05
1USNRC COMPUTER CODE-PAVAN, VERSION 2.0          RUN DATE: Wed Apr 14 10:41:55 2004

/PLANT NAME: Palisades                           METEOROLOGICAL INSTRUMENTATION
 DATA PERIOD:  1999-2003                         WIND SENSORS HEIGHT: 10 Meters       DT
 TYPE OF RELEASE: Ground Level Release           DELTA-T HEIGHTS: from 10m to 60m
 SOURCE OF DATA: Data from onsite met tower
 COMMENTS: NONE
 PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145
0PARAMETER VALUES FOR THE CHI/Q CALCULATIONS FOR THE SSE SECTOR.
 STABILITY WINDSPEED FREQUENCY DISTANCE TERRAIN HT EFF PLUME HT  SIGMA-Y SIGMA-Z MEANDER-SY  ** CHI/Q VALUES (SEC/CUBIC METER)
   CLASS   METER/SEC  PERCENT   METERS    METERS      METERS      METERS  METERS   METERS        MEANDER   BLDG WAKE        USED
          AT  10.0 METERS                                                                              CA=1006.SQ.METERS

    A         0.1       0.00      677.        0.          0.       131.7   215.2    131.7      1.126E-04   1.113E-04   1.113E-04
    A         1.5       0.86      677.        0.          0.       131.7   215.2    131.7      7.507E-06   7.423E-06   7.423E-06
    A         3.0      13.51      677.        0.          0.       131.7   215.2    131.7      3.753E-06   3.711E-06   3.711E-06
    A         5.0      11.93      677.        0.          0.       131.7   215.2    131.7      2.252E-06   2.227E-06   2.227E-06
    A         7.5       1.59      677.        0.          0.       131.7   215.2    131.7      1.501E-06   1.485E-06   1.485E-06
    A        10.0       0.32      677.        0.          0.       131.7   215.2    131.7      1.126E-06   1.113E-06   1.113E-06

    B         0.1       0.00      677.        0.          0.        99.0    71.6     99.0      4.500E-04   4.306E-04   4.306E-04
    B         1.5       0.54      677.        0.          0.        99.0    71.6     99.0      3.000E-05   2.871E-05   2.871E-05
    B         3.0       1.49      677.        0.          0.        99.0    71.6     99.0      1.500E-05   1.435E-05   1.435E-05
    B         5.0       1.91      677.        0.          0.        99.0    71.6     99.0      9.000E-06   8.612E-06   8.612E-06
    B         7.5       0.64      677.        0.          0.        99.0    71.6     99.0      6.000E-06   5.741E-06   5.741E-06
    B        10.0       0.10      677.        0.          0.        99.0    71.6     99.0      4.500E-06   4.306E-06   4.306E-06

    C         0.1       0.01      677.        0.          0.        75.2    42.8     75.2      9.907E-04   9.012E-04   9.012E-04
    C         1.5       0.42      677.        0.          0.        75.2    42.8     75.2      6.605E-05   6.008E-05   6.008E-05
    C         3.0       2.35      677.        0.          0.        75.2    42.8     75.2      3.302E-05   3.004E-05   3.004E-05
    C         5.0       1.81      677.        0.          0.        75.2    42.8     75.2      1.981E-05   1.802E-05   1.802E-05
    C         7.5       0.86      677.        0.          0.        75.2    42.8     75.2      1.321E-05   1.202E-05   1.202E-05
    C        10.0       0.10      677.        0.          0.        75.2    42.8     75.2      9.907E-06   9.012E-06   9.012E-06

    D         0.1       0.15      677.        0.          0.        53.0    23.3    105.9      1.291E-03   2.051E-03   1.291E-03
    D         1.5       3.30      677.        0.          0.        53.0    23.3    105.9      8.608E-05   1.367E-04   8.608E-05
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    D         3.0      10.75      677.        0.          0.        53.0    23.3     82.1      5.550E-05   6.837E-05   5.550E-05
    D         5.0      14.17      677.        0.          0.        53.0    23.3     59.5      4.596E-05   4.102E-05   4.102E-05
    D         7.5      11.93      677.        0.          0.        53.0    23.3     53.0      3.443E-05   2.735E-05   2.735E-05
    D        10.0       2.88      677.        0.          0.        53.0    23.3     53.0      2.582E-05   2.051E-05   2.051E-05
    D        15.0       0.10      677.        0.          0.        53.0    23.3     53.0      1.722E-05   1.367E-05   1.367E-05

    E         0.1       0.10      677.        0.          0.        37.7    16.2    113.0      1.746E-03   3.437E-03   1.746E-03
    E         1.5       3.20      677.        0.          0.        37.7    16.2    113.0      1.164E-04   2.292E-04   1.164E-04
    E         3.0       7.55      677.        0.          0.        37.7    16.2     75.7      8.688E-05   1.146E-04   8.688E-05
    E         5.0       3.62      677.        0.          0.        37.7    16.2     45.4      8.688E-05   6.875E-05   6.875E-05
    E         7.5       0.64      677.        0.          0.        37.7    16.2     37.7      6.985E-05   4.583E-05   4.583E-05
    E        10.0       0.10      677.        0.          0.        37.7    16.2     37.7      5.239E-05   3.437E-05   3.437E-05

    F         0.1       0.02      677.        0.          0.        26.0    10.3    104.0      2.975E-03   5.432E-03   2.975E-03
    F         1.5       1.17      677.        0.          0.        26.0    10.3    104.0      1.983E-04   3.621E-04   1.983E-04
    F         3.0       0.95      677.        0.          0.        26.0    10.3     62.7      1.644E-04   1.811E-04   1.644E-04
    F         5.0       0.10      677.        0.          0.        26.0    10.3     32.9      1.879E-04   1.086E-04   1.086E-04

    G         0.1       0.00      677.        0.          0.        17.9     6.6    107.6      4.504E-03   9.007E-03   4.504E-03
    G         1.5       0.32      677.        0.          0.        17.9     6.6    107.6      3.003E-04   6.004E-04   3.003E-04
    G         3.0       0.54      677.        0.          0.        17.9     6.6     56.0      2.885E-04   3.002E-04   2.885E-04
1USNRC COMPUTER CODE-PAVAN, VERSION 2.0          RUN DATE: Wed Apr 14 10:41:55 2004

/PLANT NAME: Palisades                           METEOROLOGICAL INSTRUMENTATION
 DATA PERIOD:  1999-2003                         WIND SENSORS HEIGHT: 10 Meters        DT
 TYPE OF RELEASE: Ground Level Release           DELTA-T HEIGHTS: from 10m to 60m
 SOURCE OF DATA: Data from onsite met tower
 COMMENTS: NONE
 PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145
0SITE EXCLUSION BOUNDARY CALCULATIONS:
0 SSE SECTOR     BOUNDARY DISTANCE =  677.0 METERS
0LATERAL PLUME MEANDER/BUILDING WAKE CREDIT ALLOWED
 AS A FUNCTION OF DOWNWIND DISTANCE.
 MEANDER CREDIT IS FOR WINDSPEEDS LESS THAN 6 MPS.
 BUILDING WAKE CREDIT ALLOWED:   C=  0.5     A=  2011.     D=   58.5
 CORRECTION FACTORS USED IN THE ANNUAL AVERAGE CALCULATIONS.
0BELOW ARE PRINTED THE ORDERED VALUES OF CHI/Q AND THE FREQUENCY WITH WHICH THAT VALUE IS REACHED OR EXCEEDED.
 THE TOP NUMBER IS THE CHI/Q.  THE MIDDLE NUMBER IS THE FREQUENCY NORMALIZED TO THIS SECTOR.
 THE THIRD NUMBER IS THE FREQUENCY WITH RESPECT TO ALL TIME.
0   4.504E-03   2.975E-03   1.746E-03   1.291E-03   9.012E-04   4.306E-04   3.003E-04   2.885E-04   1.983E-04   1.644E-04
        0.003       0.026       0.125       0.274       0.280       0.285       0.602       1.140       2.313       3.266
      0.00028     0.00241     0.01176     0.02577     0.02634     0.02674     0.05659     0.10711     0.21733     0.30688
0   1.164E-04   1.113E-04   1.086E-04   8.688E-05   8.608E-05   6.875E-05   6.008E-05   5.550E-05   4.583E-05   4.102E-05
        6.468       6.471       6.569      14.121      17.420      21.037      21.452      32.206      32.841      47.016
      0.60769     0.60800     0.61718     1.32671     1.63670     1.97654     2.01557     3.02591     3.08561     4.41741
0   3.437E-05   3.004E-05   2.871E-05   2.735E-05   2.051E-05   1.802E-05   1.435E-05   1.367E-05   1.202E-05   9.012E-06
       47.114      49.460      49.997      61.924      64.808      66.616      68.107      68.205      69.060      69.158
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      4.42659     4.64703     4.69755     5.81810     6.08905     6.25897     6.39904     6.40823     6.48859     6.49778
0   8.612E-06   7.423E-06   5.741E-06   4.306E-06   3.711E-06   2.227E-06   1.485E-06   1.113E-06
       71.064      71.919      72.555      72.652      86.167      98.094      99.682     100.000
      6.67688     6.75725     6.81695     6.82613     8.09594     9.21649     9.36574     9.39559
0          X/Q PERCENTILES
 (BASED ON THE UPPER ENVELOPE OF THE
 ORDERED X/Q-FREQUENCY VALUES, AND AS
 PLOTTED ON A LOG-NORMAL GRAPH.)
0 PERCENT OF TIME CHI/Q IS EQUALED OR EXCEEDED
        CHI/Q      WITH RESPECT TO     WHEN THE WIND BLOWS
 SEC/CUBIC METER  THE TOTAL TIME      INTO THIS SECTOR ONLY

                                                        HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 3)=   0.012
                                                        HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 4)=   0.026
                                                        HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 5)=   0.607
                                                        HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 7)=   3.023
                                                        HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 8)=   4.414
                                                        HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 9)=   5.814
     5.211E-04              0.094              1.000
     2.229E-04              0.282              3.000
     1.456E-04              0.470              5.000
     1.024E-04              0.940             10.000
     9.032E-05              1.409             15.000
     7.828E-05              1.879             20.000
     6.685E-05              2.349             25.000
     5.852E-05              2.819             30.000
     5.202E-05              3.288             35.000
     4.680E-05              3.758             40.000
     4.253E-05              4.228             45.000
     3.754E-05              4.698             50.000
     3.266E-05              5.168             55.000
     2.868E-05              5.637             60.000
0    1.380E-04              0.5                5.32
0ANNUAL AVERAGE =   1.38E-05
1USNRC COMPUTER CODE-PAVAN, VERSION 2.0          RUN DATE: Wed Apr 14 10:41:55 2004

/PLANT NAME: Palisades                           METEOROLOGICAL INSTRUMENTATION
 DATA PERIOD:  1999-2003                         WIND SENSORS HEIGHT: 10 Meters        DT
 TYPE OF RELEASE: Ground Level Release           DELTA-T HEIGHTS: from 10m to 60m
 SOURCE OF DATA: Data from onsite met tower
 COMMENTS: NONE
 PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145
0PARAMETER VALUES FOR THE CHI/Q CALCULATIONS FOR THE ALL SECTOR.
 STABILITY WINDSPEED FREQUENCY DISTANCE TERRAIN HT EFF PLUME HT  SIGMA-Y SIGMA-Z MEANDER-SY  ** CHI/Q VALUES (SEC/CUBIC METER)
   CLASS   METER/SEC  PERCENT   METERS    METERS      METERS      METERS  METERS   METERS        MEANDER   BLDG WAKE        USED
         AT  10.0 METERS                                                                                  CA=1006.SQ.METERS
```

A	0.1	0.00	677.	0.	0.	131.7	215.2	131.7	1.126E-04	1.113E-04	1.113E-04
A	1.5	1.19	677.	0.	0.	131.7	215.2	131.7	7.507E-06	7.423E-06	7.423E-06
A	3.0	8.30	677.	0.	0.	131.7	215.2	131.7	3.753E-06	3.711E-06	3.711E-06
A	5.0	5.74	677.	0.	0.	131.7	215.2	131.7	2.252E-06	2.227E-06	2.227E-06
A	7.5	0.81	677.	0.	0.	131.7	215.2	131.7	1.501E-06	1.485E-06	1.485E-06
A	10.0	0.08	677.	0.	0.	131.7	215.2	131.7	1.126E-06	1.113E-06	1.113E-06
B	0.1	0.00	677.	0.	0.	99.0	71.6	99.0	4.500E-04	4.306E-04	4.306E-04
B	1.5	0.29	677.	0.	0.	99.0	71.6	99.0	3.000E-05	2.871E-05	2.871E-05
B	3.0	1.09	677.	0.	0.	99.0	71.6	99.0	1.500E-05	1.435E-05	1.435E-05
B	5.0	1.37	677.	0.	0.	99.0	71.6	99.0	9.000E-06	8.612E-06	8.612E-06
B	7.5	0.33	677.	0.	0.	99.0	71.6	99.0	6.000E-06	5.741E-06	5.741E-06
B	10.0	0.04	677.	0.	0.	99.0	71.6	99.0	4.500E-06	4.306E-06	4.306E-06
C	0.1	0.00	677.	0.	0.	75.2	42.8	75.2	9.907E-04	9.012E-04	9.012E-04
C	1.5	0.32	677.	0.	0.	75.2	42.8	75.2	6.605E-05	6.008E-05	6.008E-05
C	3.0	1.38	677.	0.	0.	75.2	42.8	75.2	3.302E-05	3.004E-05	3.004E-05
C	5.0	1.68	677.	0.	0.	75.2	42.8	75.2	1.981E-05	1.802E-05	1.802E-05
C	7.5	0.65	677.	0.	0.	75.2	42.8	75.2	1.321E-05	1.202E-05	1.202E-05
C	10.0	0.03	677.	0.	0.	75.2	42.8	75.2	9.907E-06	9.012E-06	9.012E-06
D	0.1	0.12	677.	0.	0.	53.0	23.3	53.0	2.582E-03	2.051E-03	2.051E-03
D	1.5	2.69	677.	0.	0.	53.0	23.3	53.0	1.722E-04	1.367E-04	1.367E-04
D	3.0	9.80	677.	0.	0.	53.0	23.3	53.0	8.608E-05	6.837E-05	6.837E-05
D	5.0	15.75	677.	0.	0.	53.0	23.3	53.0	5.165E-05	4.102E-05	4.102E-05
D	7.5	9.02	677.	0.	0.	53.0	23.3	53.0	3.443E-05	2.735E-05	2.735E-05
D	10.0	1.39	677.	0.	0.	53.0	23.3	53.0	2.582E-05	2.051E-05	2.051E-05
D	15.0	0.10	677.	0.	0.	53.0	23.3	53.0	1.722E-05	1.367E-05	1.367E-05
E	0.1	0.10	677.	0.	0.	37.7	16.2	37.7	5.239E-03	3.437E-03	3.437E-03
E	1.5	3.33	677.	0.	0.	37.7	16.2	37.7	3.493E-04	2.292E-04	2.292E-04
E	3.0	10.54	677.	0.	0.	37.7	16.2	37.7	1.746E-04	1.146E-04	1.146E-04
E	5.0	6.69	677.	0.	0.	37.7	16.2	37.7	1.048E-04	6.875E-05	6.875E-05
E	7.5	1.55	677.	0.	0.	37.7	16.2	37.7	6.985E-05	4.583E-05	4.583E-05
E	10.0	0.18	677.	0.	0.	37.7	16.2	37.7	5.239E-05	3.437E-05	3.437E-05
E	14.9	0.01	677.	0.	0.	37.7	16.2	37.7	3.493E-05	2.292E-05	2.292E-05
F	0.1	0.04	677.	0.	0.	26.0	10.3	26.0	1.190E-02	5.432E-03	5.432E-03
F	1.5	2.01	677.	0.	0.	26.0	10.3	26.0	7.932E-04	3.621E-04	3.621E-04
F	3.0	4.96	677.	0.	0.	26.0	10.3	26.0	3.966E-04	1.811E-04	1.811E-04
F	5.0	0.89	677.	0.	0.	26.0	10.3	26.0	2.380E-04	1.086E-04	1.086E-04
F	7.5	0.03	677.	0.	0.	26.0	10.3	26.0	1.586E-04	7.243E-05	7.243E-05
F	10.0	0.01	677.	0.	0.	26.0	10.3	26.0	1.190E-04	5.432E-05	5.432E-05
G	0.1	0.01	677.	0.	0.	17.9	6.6	17.9	2.702E-02	9.007E-03	9.007E-03
G	1.5	1.24	677.	0.	0.	17.9	6.6	17.9	1.802E-03	6.004E-04	6.004E-04
G	3.0	5.75	677.	0.	0.	17.9	6.6	17.9	9.008E-04	3.002E-04	3.002E-04

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    G         5.0       0.50      677.        0.          0.        17.9     6.6     17.9      5.405E-04   1.801E-04   1.801E-04
1USNRC COMPUTER CODE-PAVAN, VERSION 2.0          RUN DATE: Wed Apr 14 10:41:55 2004

/PLANT NAME: Palisades                           METEOROLOGICAL INSTRUMENTATION
 DATA PERIOD:  1999-2003                         WIND SENSORS HEIGHT: 10 Meters        DT
 TYPE OF RELEASE: Ground Level Release           DELTA-T HEIGHTS: from 10m to 60m
 SOURCE OF DATA: Data from onsite met tower
 COMMENTS: NONE
 PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145
0SITE EXCLUSION BOUNDARY CALCULATIONS:
 DIRECTION-INDEPENDENT (S.R.P 2.3.4) MODEL.
 MINIMUM BOUNDARY DISTANCE =  677.0 METERS.
 BUILDING WAKE CREDIT ALLOWED:   C=  0.5     A=  2011.     D=   58.5
 CORRECTION FACTORS USED IN THE ANNUAL AVERAGE CALCULATIONS.
0BELOW ARE PRINTED THE ORDERED VALUES OF CHI/Q AND THE FREQUENCY WITH WHICH THAT VALUE IS REACHED OR EXCEEDED.
 THE TOP NUMBER IS THE CHI/Q.  THE MIDDLE NUMBER IS THE FREQUENCY NORMALIZED TO THIS SECTOR.
 THE THIRD NUMBER IS THE FREQUENCY WITH RESPECT TO ALL TIME.
0   9.007E-03   5.432E-03   3.437E-03   2.051E-03   9.012E-04   6.004E-04   4.306E-04   3.621E-04   3.002E-04   2.292E-04
        0.011       0.051       0.154       0.276       0.280       1.525       1.527       3.538       9.293      12.620
      0.01148     0.05052     0.15385     0.27555     0.28014     1.52468     1.52698     3.53846     9.29277    12.61998
0   1.811E-04   1.801E-04   1.367E-04   1.146E-04   1.113E-04   1.086E-04   7.243E-05   6.875E-05   6.837E-05   6.008E-05
       17.584      18.080      20.772      31.307      31.311      32.202      32.232      38.918      48.716      49.033
     17.58438    18.08037    20.77153    31.30654    31.31114    32.20206    32.23191    38.91848    48.71641    49.03329
0   5.432E-05   4.583E-05   4.102E-05   3.437E-05   3.004E-05   2.871E-05   2.735E-05   2.292E-05   2.051E-05   1.802E-05
       49.042      50.597      66.347      66.524      67.904      68.191      77.208      77.217      78.608      80.289
     49.04247    50.59701    66.34672    66.52353    67.90355    68.19057    77.20779    77.21698    78.60848    80.28931
0   1.435E-05   1.367E-05   1.202E-05   9.012E-06   8.612E-06   7.423E-06   5.741E-06   4.306E-06   3.711E-06   2.227E-06
       81.380      81.479      82.129      82.156      83.527      84.716      85.045      85.082      93.378      99.114
     81.38000    81.47874    82.12857    82.15613    83.52696    84.71640    85.04476    85.08150    93.37772    99.11366
0   1.485E-06   1.113E-06
       99.920     100.000
     99.91962    99.99999
0          X/Q PERCENTILES
 (BASED ON THE UPPER ENVELOPE OF THE
 ORDERED X/Q-FREQUENCY VALUES, AND AS
 PLOTTED ON A LOG-NORMAL GRAPH.)
0 PERCENT OF TIME CHI/Q IS EQUALED OR EXCEEDED
        CHI/Q      WITH RESPECT TO     WHEN THE WIND BLOWS
 SEC/CUBIC METER  THE TOTAL TIME      INTO THIS SECTOR ONLY

                                                          HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 2)=   0.050
                                                          HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 3)=   0.154
                                                          HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 4)=  18.083
     1.381E-03             1.000             1.000
     7.269E-04             3.000             3.000
     5.175E-04             5.000             5.000
     3.067E-04            10.000            10.000
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     2.154E-04             15.000             15.000
     1.671E-04             20.000             20.000
     1.398E-04             25.000             25.000
     1.192E-04             30.000             30.000
     1.021E-04             35.000             35.000
     8.795E-05             40.000             40.000
     7.614E-05             45.000             45.000
     6.607E-05             50.000             50.000
     5.734E-05             55.000             55.000
     4.964E-05             60.000             60.000
     4.276E-05             65.000             65.000
     3.622E-05             70.000             70.000
     3.018E-05             75.000             75.000
     2.464E-05             80.000             80.000
     1.944E-05             85.000             85.000
     1.443E-05             90.000             90.000
0    5.175E-04              5.0                5.00
1USNRC COMPUTER CODE-PAVAN, VERSION 2.0          RUN DATE: Wed Apr 14 10:41:55 2004

/PLANT NAME: Palisades                           METEOROLOGICAL INSTRUMENTATION
 DATA PERIOD:  1999-2003                         WIND SENSORS HEIGHT: 10 Meters       DT
 TYPE OF RELEASE: Ground Level Release           DELTA-T HEIGHTS: from 10m to 60m
 SOURCE OF DATA: Data from onsite met tower
 COMMENTS: NONE
 PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145
0SITE EXCLUSION BOUNDARY CALCULATIONS:
0FIVE PERCENT OVERALL SITE LIMIT
 BUILDING WAKE CREDIT ALLOWED:   C=  0.5     A=  2011.     D=   58.5
 CORRECTION FACTORS USED IN THE ANNUAL AVERAGE CALCULATIONS.
0BELOW ARE PRINTED THE ORDERED VALUES OF CHI/Q AND THE FREQUENCY WITH WHICH THAT VALUE IS REACHED OR EXCEEDED.
 THE TOP NUMBER IS THE CHI/Q.  THE MIDDLE NUMBER IS THE FREQUENCY NORMALIZED TO THIS SECTOR.
 THE THIRD NUMBER IS THE FREQUENCY WITH RESPECT TO ALL TIME.
0   4.504E-03   2.975E-03   1.746E-03   1.291E-03   9.012E-04   4.306E-04   3.003E-04   2.885E-04   1.983E-04   1.801E-04
        0.011       0.051       0.154       0.276       0.280       0.282       1.527       7.281       9.293       9.789
      0.01148     0.05052     0.15385     0.27555     0.28014     0.28243     1.52698     7.28129     9.29277     9.78875
0   1.644E-04   1.164E-04   1.113E-04   1.086E-04   8.688E-05   8.608E-05   7.243E-05   6.875E-05   6.008E-05   5.550E-05
       14.753      18.080      18.085      18.976      29.511      32.202      32.232      38.918      39.235      49.033
     14.75316    18.08037    18.08496    18.97589    29.51091    32.20206    32.23191    38.91848    39.23536    49.03329
0   5.432E-05   4.583E-05   4.102E-05   3.437E-05   3.004E-05   2.871E-05   2.735E-05   2.292E-05   2.051E-05   1.802E-05
       49.042      50.597      66.347      66.524      67.904      68.191      77.208      77.217      78.608      80.289
     49.04248    50.59701    66.34672    66.52353    67.90355    68.19057    77.20780    77.21699    78.60849    80.28933
0   1.435E-05   1.367E-05   1.202E-05   9.012E-06   8.612E-06   7.423E-06   5.741E-06   4.306E-06   3.711E-06   2.227E-06
       81.380      81.479      82.129      82.156      83.527      84.716      85.045      85.082      93.378      99.114
     81.38004    81.47878    82.12862    82.15618    83.52702    84.71644    85.04481    85.08155    93.37775    99.11370
0   1.485E-06   1.113E-06
       99.920     100.000
     99.91967   100.00005
```

```
0          X/Q PERCENTILES
 (BASED ON THE UPPER ENVELOPE OF THE
 ORDERED X/Q-FREQUENCY VALUES, AND AS
 PLOTTED ON A LOG-NORMAL GRAPH.)
0 PERCENT OF TIME CHI/Q IS EQUALED OR EXCEEDED
        CHI/Q      WITH RESPECT TO     WHEN THE WIND BLOWS
 SEC/CUBIC METER  THE TOTAL TIME      INTO THIS SECTOR ONLY

0                                                    ERROR IN NORMAL TRANSFORMATION FOR A( 42)= 100.00005
                                                      HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 2)=   0.050
                                                      HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 3)=   7.277
     8.749E-04              1.000             1.000
     4.961E-04              3.000             3.000
     3.673E-04              5.000             5.000
     2.335E-04             10.000            10.000
     1.733E-04             15.000            15.000
     1.367E-04             20.000            20.000
     1.115E-04             25.000            25.000
     9.287E-05             30.000            30.000
     8.071E-05             35.000            35.000
     7.225E-05             40.000            40.000
     6.492E-05             45.000            45.000
     5.843E-05             50.000            50.000
     5.260E-05             55.000            55.000
     4.726E-05             60.000            60.000
     4.230E-05             65.000            65.000
     3.622E-05             70.000            70.000
     3.018E-05             75.000            75.000
     2.464E-05             80.000            80.000
     1.944E-05             85.000            85.000
     1.443E-05             90.000            90.000
0    3.673E-04              5.0               5.00
1USNRC COMPUTER CODE-PAVAN, VERSION 2.0          RUN DATE: Wed Apr 14 10:41:55 2004

/PLANT NAME: Palisades                           METEOROLOGICAL INSTRUMENTATION
 DATA PERIOD:  1999-2003                         WIND SENSORS HEIGHT: 10 Meters       DT
 TYPE OF RELEASE: Ground Level Release           DELTA-T HEIGHTS: from 10m to 60m
 SOURCE OF DATA: Data from onsite met tower
 COMMENTS: NONE
 PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145
0                                  RELATIVE CONCENTRATION (X/Q) VALUES (SEC/CUBIC METER)
                                                    VERSUS                                  HOURS PER YEAR MAX
                                                 AVERAGING TIME                                  0-2 HR X/Q IS
 DOWNWIND DISTANCE                                                                                EXCEEDED  DOWNWIND
 SECTOR   (METERS)        0-2 HOURS      0-8 HOURS     8-24 HOURS       1-4 DAYS      4-30 DAYS ANNUAL AVERAGE IN SECTOR    SECTOR
      S      677.         1.57E-04       1.01E-04       8.07E-05       4.98E-05       2.49E-05       1.07E-05       7.3         S
    SSW      677.         1.61E-04       9.85E-05       7.70E-05       4.51E-05       2.10E-05       8.20E-06     225.9       SSW
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SW	677.	1.96E-04	1.18E-04	9.11E-05	5.24E-05	2.36E-05	8.94E-06	7.8	SW
WSW	677.	2.37E-04	1.39E-04	1.07E-04	5.97E-05	2.60E-05	9.41E-06	10.4	WSW
W	677.	2.82E-04	1.65E-04	1.26E-04	7.04E-05	3.05E-05	1.10E-05	13.1	W
WNW	677.	3.39E-04	1.98E-04	1.51E-04	8.41E-05	3.63E-05	1.30E-05	17.3	WNW
NW	677.	4.49E-04	2.65E-04	2.04E-04	1.15E-04	5.07E-05	1.86E-05	29.9	NW
NNW	677.	5.39E-04	3.31E-04	2.59E-04	1.53E-04	7.14E-05	2.82E-05	43.7	NNW
N	677.	5.19E-04	3.16E-04	2.46E-04	1.44E-04	6.63E-05	2.57E-05	40.6	N
NNE	677.	2.76E-04	1.65E-04	1.27E-04	7.30E-05	3.28E-05	1.23E-05	12.6	NNE
NE	677.	1.38E-04	9.09E-05	7.38E-05	4.69E-05	2.44E-05	1.10E-05	5.2	NE
ENE	677.	1.07E-04	7.11E-05	5.79E-05	3.70E-05	1.95E-05	8.90E-06	4.6	ENE
E	677.	1.00E-04	6.62E-05	5.38E-05	3.42E-05	1.79E-05	8.09E-06	3.7	E
ESE	677.	1.02E-04	6.84E-05	5.59E-05	3.61E-05	1.92E-05	8.91E-06	3.8	ESE
SE	677.	1.13E-04	7.73E-05	6.39E-05	4.24E-05	2.35E-05	1.14E-05	6.1	SE
SSE	677.	1.38E-04	9.43E-05	7.80E-05	5.16E-05	2.85E-05	1.38E-05	7.9	SSE
MAX X/Q		5.39E-04				TOTAL HOURS AROUND SITE:		439.9	
SRP 2.3.4	677.	5.18E-04	3.20E-04	2.51E-04	1.49E-04	7.05E-05	2.82E-05		
SITE LIMIT		3.67E-04	2.40E-04	1.94E-04	1.23E-04	6.33E-05	2.82E-05		

00.5 PERCENT X/Q TO AN INDIVIDUAL IS LIMITING.
0**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.
1USNRC COMPUTER CODE-PAVAN, VERSION 2.0 RUN DATE: Wed Apr 14 10:41:55 2004

/PLANT NAME: Palisades METEOROLOGICAL INSTRUMENTATION
DATA PERIOD: 1999-2003 WIND SENSORS HEIGHT: 10 Meters DT
TYPE OF RELEASE: Ground Level Release DELTA-T HEIGHTS: from 10m to 60m
SOURCE OF DATA: Data from onsite met tower
COMMENTS: NONE
PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145
0PARAMETER VALUES FOR THE CHI/Q CALCULATIONS FOR THE S SECTOR.

STABILITY CLASS	WINDSPEED AT 10.0 METERS METER/SEC	FREQUENCY PERCENT	DISTANCE METERS	TERRAIN HT METERS	EFF PLUME HT METERS	SIGMA-Y METERS	SIGMA-Z METERS	MEANDER-SY METERS	** CHI/Q VALUES (SEC/CUBIC METER) MEANDER	BLDG WAKE CA=1006.SQ.METERS	USED
A	0.1	0.00	4820.	0.	0.	775.2	1000.0	775.2	4.116E-06	4.115E-06	4.115E-06
A	1.5	0.91	4820.	0.	0.	775.2	1000.0	775.2	2.744E-07	2.743E-07	2.743E-07
A	3.0	2.77	4820.	0.	0.	775.2	1000.0	775.2	1.372E-07	1.372E-07	1.372E-07
A	5.0	2.56	4820.	0.	0.	775.2	1000.0	775.2	8.233E-08	8.230E-08	8.230E-08
A	7.5	0.69	4820.	0.	0.	775.2	1000.0	775.2	5.489E-08	5.486E-08	5.486E-08
B	3.0	0.91	4820.	0.	0.	583.0	610.6	583.0	2.988E-07	2.985E-07	2.985E-07
B	5.0	0.91	4820.	0.	0.	583.0	610.6	583.0	1.793E-07	1.791E-07	1.791E-07
B	7.5	0.21	4820.	0.	0.	583.0	610.6	583.0	1.195E-07	1.194E-07	1.194E-07
C	0.1	0.00	4820.	0.	0.	442.7	256.1	442.7	2.815E-05	2.807E-05	2.807E-05

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    C         1.5       0.21     4820.        0.          0.       442.7   256.1    442.7      1.877E-06   1.871E-06   1.871E-06
    C         3.0       1.65     4820.        0.          0.       442.7   256.1    442.7      9.384E-07   9.357E-07   9.357E-07
    C         5.0       1.39     4820.        0.          0.       442.7   256.1    442.7      5.630E-07   5.614E-07   5.614E-07
    C         7.5       0.69     4820.        0.          0.       442.7   256.1    442.7      3.753E-07   3.743E-07   3.743E-07

    D         0.1       0.17     4820.        0.          0.       311.7    87.2    373.3      9.804E-05   1.160E-04   9.804E-05
    D         1.5       3.73     4820.        0.          0.       311.7    87.2    373.3      6.536E-06   7.736E-06   6.536E-06
    D         3.0      14.18     4820.        0.          0.       311.7    87.2    345.6      3.529E-06   3.868E-06   3.529E-06
    D         5.0      17.65     4820.        0.          0.       311.7    87.2    319.3      2.292E-06   2.321E-06   2.292E-06
    D         7.5       6.72     4820.        0.          0.       311.7    87.2    311.7      1.565E-06   1.547E-06   1.547E-06
    D        10.0       0.69     4820.        0.          0.       311.7    87.2    311.7      1.174E-06   1.160E-06   1.160E-06

    E         0.1       0.20     4820.        0.          0.       221.7    55.4    309.2      1.867E-04   2.539E-04   1.867E-04
    E         1.5       6.29     4820.        0.          0.       221.7    55.4    309.2      1.245E-05   1.693E-05   1.245E-05
    E         3.0      20.21     4820.        0.          0.       221.7    55.4    265.9      7.239E-06   8.463E-06   7.239E-06
    E         5.0       6.03     4820.        0.          0.       221.7    55.4    230.7      5.006E-06   5.078E-06   5.006E-06
    E         7.5       0.21     4820.        0.          0.       221.7    55.4    221.7      3.473E-06   3.385E-06   3.385E-06

    F         0.1       0.06     4820.        0.          0.       153.0    34.5    243.7      3.809E-04   5.719E-04   3.809E-04
    F         1.5       3.04     4820.        0.          0.       153.0    34.5    243.7      2.539E-05   3.813E-05   2.539E-05
    F         3.0       4.64     4820.        0.          0.       153.0    34.5    195.7      1.581E-05   1.906E-05   1.581E-05
    F         5.0       0.48     4820.        0.          0.       153.0    34.5    161.1      1.153E-05   1.144E-05   1.144E-05

    G         0.1       0.01     4820.        0.          0.       105.6    21.4    209.9      7.107E-04   1.238E-03   7.107E-04
    G         1.5       1.17     4820.        0.          0.       105.6    21.4    209.9      4.738E-05   8.251E-05   4.738E-05
    G         3.0       1.39     4820.        0.          0.       105.6    21.4    149.9      3.318E-05   4.126E-05   3.318E-05
    G         5.0       0.21     4820.        0.          0.       105.6    21.4    113.1      2.639E-05   2.475E-05   2.475E-05
1USNRC COMPUTER CODE-PAVAN, VERSION 2.0          RUN DATE: Wed Apr 14 10:41:55 2004

/PLANT NAME: Palisades                           METEOROLOGICAL INSTRUMENTATION
 DATA PERIOD:  1999-2003                         WIND SENSORS HEIGHT: 10 Meters        DT
 TYPE OF RELEASE: Ground Level Release           DELTA-T HEIGHTS: from 10m to 60m
 SOURCE OF DATA: Data from onsite met tower
 COMMENTS: NONE
 PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145
0LOW POPULATION ZONE CALCULATIONS:
0   S SECTOR     BOUNDARY DISTANCE = 4820.0 METERS
0LATERAL PLUME MEANDER/BUILDING WAKE CREDIT ALLOWED
 AS A FUNCTION OF DOWNWIND DISTANCE.
 MEANDER CREDIT IS FOR WINDSPEEDS LESS THAN 6 MPS.
 BUILDING WAKE CREDIT ALLOWED:   C=  0.5     A=  2011.     D=   58.5
 CORRECTION FACTORS USED IN THE ANNUAL AVERAGE CALCULATIONS.
0BELOW ARE PRINTED THE ORDERED VALUES OF CHI/Q AND THE FREQUENCY WITH WHICH THAT VALUE IS REACHED OR EXCEEDED.
 THE TOP NUMBER IS THE CHI/Q.  THE MIDDLE NUMBER IS THE FREQUENCY NORMALIZED TO THIS SECTOR.
 THE THIRD NUMBER IS THE FREQUENCY WITH RESPECT TO ALL TIME.
0   7.107E-04   3.809E-04   1.867E-04   9.804E-05   4.738E-05   3.318E-05   2.807E-05   2.539E-05   2.475E-05   1.581E-05
        0.011       0.070       0.265       0.434       1.607       2.994       2.997       6.036       6.250      10.889
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      0.00047     0.00301     0.01142     0.01869     0.06921     0.12891     0.12904     0.25992     0.26911     0.46888
0   1.245E-05   1.144E-05   7.239E-06   6.536E-06   5.006E-06   4.115E-06   3.529E-06   3.385E-06   2.292E-06   1.871E-06
       17.181      17.661      37.872      41.605      47.631      47.634      61.819      62.032      79.683      79.896
      0.73983     0.76050     1.63076     1.79150     2.05097     2.05112     2.66191     2.67110     3.43114     3.44033
0   1.547E-06   1.160E-06   9.357E-07   5.614E-07   3.743E-07   2.985E-07   2.743E-07   1.791E-07   1.372E-07   1.194E-07
       86.615      87.308      88.962      90.348      91.041      91.948      92.854      93.761      96.534      96.747
      3.72965     3.75950     3.83068     3.89039     3.92024     3.95927     3.99831     4.03734     4.15675     4.16593
0   8.230E-08   5.486E-08
       99.307     100.000
      4.27615     4.30600
0          X/Q PERCENTILES
 (BASED ON THE UPPER ENVELOPE OF THE
 ORDERED X/Q-FREQUENCY VALUES, AND AS
 PLOTTED ON A LOG-NORMAL GRAPH.)
0 PERCENT OF TIME CHI/Q IS EQUALED OR EXCEEDED
        CHI/Q      WITH RESPECT TO     WHEN THE WIND BLOWS
 SEC/CUBIC METER  THE TOTAL TIME      INTO THIS SECTOR ONLY

                                                          HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 2)=   0.003
                                                          HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 3)=   0.739
                                                          HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 4)=   1.629
                                                          HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 5)=   1.790
                                                          HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 6)=   2.659
                                                          HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 7)=   3.428
     8.698E-05              0.043              1.000
     4.350E-05              0.129              3.000
     3.083E-05              0.215              5.000
     1.880E-05              0.431             10.000
     1.384E-05              0.646             15.000
     1.126E-05              0.861             20.000
     9.692E-06              1.076             25.000
     8.544E-06              1.292             30.000
     7.661E-06              1.507             35.000
     6.823E-06              1.722             40.000
     5.802E-06              1.938             45.000
     4.933E-06              2.153             50.000
     4.250E-06              2.368             55.000
     3.702E-06              2.584             60.000
     3.246E-06              2.799             65.000
     2.864E-06              3.014             70.000
     2.545E-06              3.229             75.000
0    1.682E-05              0.5               11.61
0ANNUAL AVERAGE =   2.22E-07
1USNRC COMPUTER CODE-PAVAN, VERSION 2.0          RUN DATE: Wed Apr 14 10:41:55 2004

/PLANT NAME: Palisades                           METEOROLOGICAL INSTRUMENTATION
 DATA PERIOD:  1999-2003                         WIND SENSORS HEIGHT: 10 Meters        DT
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TYPE OF RELEASE: Ground Level Release DELTA-T HEIGHTS: from 10m to 60m
SOURCE OF DATA: Data from onsite met tower
COMMENTS: NONE
PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145
0PARAMETER VALUES FOR THE CHI/Q CALCULATIONS FOR THE SSW SECTOR.

STABILITY CLASS	WINDSPEED AT 10.0 METERS METER/SEC	FREQUENCY PERCENT	DISTANCE METERS	TERRAIN HT METERS	EFF PLUME HT METERS	SIGMA-Y METERS	SIGMA-Z METERS	MEANDER-SY METERS	** CHI/Q VALUES (SEC/CUBIC METER) MEANDER	BLDG WAKE CA=1006.SQ.METERS	USED
A	0.1	0.01	4820.	0.	0.	775.2	1000.0	775.2	4.116E-06	4.115E-06	4.115E-06
A	1.5	1.33	4820.	0.	0.	775.2	1000.0	775.2	2.744E-07	2.743E-07	2.743E-07
A	3.0	3.77	4820.	0.	0.	775.2	1000.0	775.2	1.372E-07	1.372E-07	1.372E-07
A	5.0	2.43	4820.	0.	0.	775.2	1000.0	775.2	8.233E-08	8.230E-08	8.230E-08
B	3.0	1.02	4820.	0.	0.	583.0	610.6	583.0	2.988E-07	2.985E-07	2.985E-07
B	5.0	0.71	4820.	0.	0.	583.0	610.6	583.0	1.793E-07	1.791E-07	1.791E-07
C	0.1	0.01	4820.	0.	0.	442.7	256.1	442.7	2.815E-05	2.807E-05	2.807E-05
C	1.5	0.71	4820.	0.	0.	442.7	256.1	442.7	1.877E-06	1.871E-06	1.871E-06
C	3.0	1.73	4820.	0.	0.	442.7	256.1	442.7	9.384E-07	9.357E-07	9.357E-07
C	5.0	1.02	4820.	0.	0.	442.7	256.1	442.7	5.630E-07	5.614E-07	5.614E-07
C	7.5	0.31	4820.	0.	0.	442.7	256.1	442.7	3.753E-07	3.743E-07	3.743E-07
D	0.1	0.22	4820.	0.	0.	311.7	87.2	373.3	9.804E-05	1.160E-04	9.804E-05
D	1.5	4.79	4820.	0.	0.	311.7	87.2	373.3	6.536E-06	7.736E-06	6.536E-06
D	3.0	16.79	4820.	0.	0.	311.7	87.2	345.6	3.529E-06	3.868E-06	3.529E-06
D	5.0	14.36	4820.	0.	0.	311.7	87.2	319.3	2.292E-06	2.321E-06	2.292E-06
D	7.5	1.73	4820.	0.	0.	311.7	87.2	311.7	1.565E-06	1.547E-06	1.547E-06
E	0.1	0.21	4820.	0.	0.	221.7	55.4	309.2	1.867E-04	2.539E-04	1.867E-04
E	1.5	6.83	4820.	0.	0.	221.7	55.4	309.2	1.245E-05	1.693E-05	1.245E-05
E	3.0	20.16	4820.	0.	0.	221.7	55.4	265.9	7.239E-06	8.463E-06	7.239E-06
E	5.0	5.49	4820.	0.	0.	221.7	55.4	230.7	5.006E-06	5.078E-06	5.006E-06
F	0.1	0.06	4820.	0.	0.	153.0	34.5	243.7	3.809E-04	5.719E-04	3.809E-04
F	1.5	3.06	4820.	0.	0.	153.0	34.5	243.7	2.539E-05	3.813E-05	2.539E-05
F	3.0	8.87	4820.	0.	0.	153.0	34.5	195.7	1.581E-05	1.906E-05	1.581E-05
F	5.0	0.31	4820.	0.	0.	153.0	34.5	161.1	1.153E-05	1.144E-05	1.144E-05
G	0.1	0.01	4820.	0.	0.	105.6	21.4	209.9	7.107E-04	1.238E-03	7.107E-04
G	1.5	1.33	4820.	0.	0.	105.6	21.4	209.9	4.738E-05	8.251E-05	4.738E-05
G	3.0	2.43	4820.	0.	0.	105.6	21.4	149.9	3.318E-05	4.126E-05	3.318E-05
G	5.0	0.31	4820.	0.	0.	105.6	21.4	113.1	2.639E-05	2.475E-05	2.475E-05

1USNRC COMPUTER CODE-PAVAN, VERSION 2.0 RUN DATE: Wed Apr 14 10:41:55 2004

/PLANT NAME: Palisades METEOROLOGICAL INSTRUMENTATION
DATA PERIOD: 1999-2003 WIND SENSORS HEIGHT: 10 Meters DT

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 TYPE OF RELEASE: Ground Level Release           DELTA-T HEIGHTS: from 10m to 60m
 SOURCE OF DATA: Data from onsite met tower
 COMMENTS: NONE
 PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145
0LOW POPULATION ZONE CALCULATIONS:
0 SSW SECTOR     BOUNDARY DISTANCE = 4820.0 METERS
0LATERAL PLUME MEANDER/BUILDING WAKE CREDIT ALLOWED
 AS A FUNCTION OF DOWNWIND DISTANCE.
 MEANDER CREDIT IS FOR WINDSPEEDS LESS THAN 6 MPS.
 BUILDING WAKE CREDIT ALLOWED:   C=  0.5     A=  2011.     D=   58.5
 CORRECTION FACTORS USED IN THE ANNUAL AVERAGE CALCULATIONS.
0BELOW ARE PRINTED THE ORDERED VALUES OF CHI/Q AND THE FREQUENCY WITH WHICH THAT VALUE IS REACHED OR EXCEEDED.
 THE TOP NUMBER IS THE CHI/Q.  THE MIDDLE NUMBER IS THE FREQUENCY NORMALIZED TO THIS SECTOR.
 THE THIRD NUMBER IS THE FREQUENCY WITH RESPECT TO ALL TIME.
0   7.107E-04   3.809E-04   1.867E-04   9.804E-05   4.738E-05   3.318E-05   2.807E-05   2.539E-05   2.475E-05   1.581E-05
        0.012       0.072       0.284       0.500       1.834       4.266       4.276       7.336       7.650      16.516
      0.00036     0.00210     0.00830     0.01464     0.05367     0.12485     0.12515     0.21471     0.22389     0.48336
0   1.245E-05   1.144E-05   7.239E-06   6.536E-06   5.006E-06   4.115E-06   3.529E-06   2.292E-06   1.871E-06   1.547E-06
       23.342      23.655      43.819      48.605      54.097      54.102      70.892      85.250      85.956      87.682
      0.68313     0.69232     1.28244     1.42251     1.58325     1.58340     2.07479     2.49499     2.51566     2.56618
0   9.357E-07   5.614E-07   3.743E-07   2.985E-07   2.743E-07   1.791E-07   1.372E-07   8.230E-08
       89.408      90.428      90.742      91.762      93.096      93.802      97.568     100.000
      2.61669     2.64654     2.65573     2.68558     2.72462     2.74528     2.85550     2.92668
0          X/Q PERCENTILES
 (BASED ON THE UPPER ENVELOPE OF THE
 ORDERED X/Q-FREQUENCY VALUES, AND AS
 PLOTTED ON A LOG-NORMAL GRAPH.)
0 PERCENT OF TIME CHI/Q IS EQUALED OR EXCEEDED
        CHI/Q      WITH RESPECT TO     WHEN THE WIND BLOWS
 SEC/CUBIC METER  THE TOTAL TIME      INTO THIS SECTOR ONLY

                                                          HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 2)=   0.002
                                                          HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 3)=   0.682
                                                          HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 4)=   1.281
                                                          HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 5)=   1.421
                                                          HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 6)=   2.073
                                                          HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 7)=   2.492
     9.575E-05              0.029              1.000
     5.000E-05              0.088              3.000
     3.625E-05              0.146              5.000
     2.287E-05              0.293             10.000
     1.722E-05              0.439             15.000
     1.397E-05              0.585             20.000
     1.176E-05              0.732             25.000
     1.008E-05              0.878             30.000
     8.827E-06              1.024             35.000
     7.851E-06              1.171             40.000
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     7.053E-06              1.317             45.000
     6.248E-06              1.463             50.000
     5.361E-06              1.610             55.000
     4.654E-06              1.756             60.000
     4.079E-06              1.902             65.000
     3.605E-06              2.049             70.000
     3.098E-06              2.195             75.000
     2.664E-06              2.341             80.000
     2.308E-06              2.488             85.000
0    1.567E-05              0.5               17.08
0ANNUAL AVERAGE =   1.69E-07
1USNRC COMPUTER CODE-PAVAN, VERSION 2.0          RUN DATE: Wed Apr 14 10:41:55 2004

/PLANT NAME: Palisades                           METEOROLOGICAL INSTRUMENTATION
 DATA PERIOD:  1999-2003                         WIND SENSORS HEIGHT: 10 Meters       DT
 TYPE OF RELEASE: Ground Level Release           DELTA-T HEIGHTS: from 10m to 60m
 SOURCE OF DATA: Data from onsite met tower
 COMMENTS: NONE
 PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145
0PARAMETER VALUES FOR THE CHI/Q CALCULATIONS FOR THE  SW SECTOR.
 STABILITY WINDSPEED FREQUENCY DISTANCE TERRAIN HT EFF PLUME HT  SIGMA-Y SIGMA-Z MEANDER-SY  ** CHI/Q VALUES (SEC/CUBIC METER)
   CLASS   METER/SEC  PERCENT   METERS    METERS      METERS      METERS  METERS   METERS        MEANDER   BLDG WAKE        USED
          AT  10.0 METERS                                                                              CA=1006.SQ.METERS

    A         0.1       0.00     4820.        0.          0.       775.2  1000.0    775.2      4.116E-06   4.115E-06   4.115E-06
    A         1.5       0.67     4820.        0.          0.       775.2  1000.0    775.2      2.744E-07   2.743E-07   2.743E-07
    A         3.0       5.79     4820.        0.          0.       775.2  1000.0    775.2      1.372E-07   1.372E-07   1.372E-07
    A         5.0       2.89     4820.        0.          0.       775.2  1000.0    775.2      8.233E-08   8.230E-08   8.230E-08
    A         7.5       0.67     4820.        0.          0.       775.2  1000.0    775.2      5.489E-08   5.486E-08   5.486E-08

    B         3.0       0.96     4820.        0.          0.       583.0   610.6    583.0      2.988E-07   2.985E-07   2.985E-07
    B         5.0       1.26     4820.        0.          0.       583.0   610.6    583.0      1.793E-07   1.791E-07   1.791E-07
    B         7.5       0.30     4820.        0.          0.       583.0   610.6    583.0      1.195E-07   1.194E-07   1.194E-07

    C         0.1       0.01     4820.        0.          0.       442.7   256.1    442.7      2.815E-05   2.807E-05   2.807E-05
    C         1.5       0.67     4820.        0.          0.       442.7   256.1    442.7      1.877E-06   1.871E-06   1.871E-06
    C         3.0       1.26     4820.        0.          0.       442.7   256.1    442.7      9.384E-07   9.357E-07   9.357E-07
    C         5.0       1.26     4820.        0.          0.       442.7   256.1    442.7      5.630E-07   5.614E-07   5.614E-07
    C         7.5       0.30     4820.        0.          0.       442.7   256.1    442.7      3.753E-07   3.743E-07   3.743E-07

    D         0.1       0.25     4820.        0.          0.       311.7    87.2    373.3      9.804E-05   1.160E-04   9.804E-05
    D         1.5       5.49     4820.        0.          0.       311.7    87.2    373.3      6.536E-06   7.736E-06   6.536E-06
    D         3.0      17.15     4820.        0.          0.       311.7    87.2    345.6      3.529E-06   3.868E-06   3.529E-06
    D         5.0      10.99     4820.        0.          0.       311.7    87.2    319.3      2.292E-06   2.321E-06   2.292E-06
    D         7.5       3.27     4820.        0.          0.       311.7    87.2    311.7      1.565E-06   1.547E-06   1.547E-06

    E         0.1       0.19     4820.        0.          0.       221.7    55.4    309.2      1.867E-04   2.539E-04   1.867E-04
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    E         1.5       6.16     4820.        0.          0.       221.7    55.4    309.2      1.245E-05   1.693E-05   1.245E-05
    E         3.0      15.51     4820.        0.          0.       221.7    55.4    265.9      7.239E-06   8.463E-06   7.239E-06
    E         5.0       2.89     4820.        0.          0.       221.7    55.4    230.7      5.006E-06   5.078E-06   5.006E-06
    E         7.5       0.67     4820.        0.          0.       221.7    55.4    221.7      3.473E-06   3.385E-06   3.385E-06

    F         0.1       0.07     4820.        0.          0.       153.0    34.5    243.7      3.809E-04   5.719E-04   3.809E-04
    F         1.5       3.86     4820.        0.          0.       153.0    34.5    243.7      2.539E-05   3.813E-05   2.539E-05
    F         3.0      10.02     4820.        0.          0.       153.0    34.5    195.7      1.581E-05   1.906E-05   1.581E-05
    F         5.0       0.67     4820.        0.          0.       153.0    34.5    161.1      1.153E-05   1.144E-05   1.144E-05

    G         0.1       0.01     4820.        0.          0.       105.6    21.4    209.9      7.107E-04   1.238E-03   7.107E-04
    G         1.5       0.96     4820.        0.          0.       105.6    21.4    209.9      4.738E-05   8.251E-05   4.738E-05
    G         3.0       5.49     4820.        0.          0.       105.6    21.4    149.9      3.318E-05   4.126E-05   3.318E-05
    G         5.0       0.30     4820.        0.          0.       105.6    21.4    113.1      2.639E-05   2.475E-05   2.475E-05
1USNRC COMPUTER CODE-PAVAN, VERSION 2.0          RUN DATE: Wed Apr 14 10:41:55 2004

/PLANT NAME: Palisades                           METEOROLOGICAL INSTRUMENTATION
 DATA PERIOD:  1999-2003                         WIND SENSORS HEIGHT: 10 Meters        DT
 TYPE OF RELEASE: Ground Level Release           DELTA-T HEIGHTS: from 10m to 60m
 SOURCE OF DATA: Data from onsite met tower
 COMMENTS: NONE
 PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145
0LOW POPULATION ZONE CALCULATIONS:
0  SW SECTOR     BOUNDARY DISTANCE = 4820.0 METERS
0LATERAL PLUME MEANDER/BUILDING WAKE CREDIT ALLOWED
 AS A FUNCTION OF DOWNWIND DISTANCE.
 MEANDER CREDIT IS FOR WINDSPEEDS LESS THAN 6 MPS.
 BUILDING WAKE CREDIT ALLOWED:   C=  0.5     A=  2011.     D=   58.5
 CORRECTION FACTORS USED IN THE ANNUAL AVERAGE CALCULATIONS.
0BELOW ARE PRINTED THE ORDERED VALUES OF CHI/Q AND THE FREQUENCY WITH WHICH THAT VALUE IS REACHED OR EXCEEDED.
 THE TOP NUMBER IS THE CHI/Q.  THE MIDDLE NUMBER IS THE FREQUENCY NORMALIZED TO THIS SECTOR.
 THE THIRD NUMBER IS THE FREQUENCY WITH RESPECT TO ALL TIME.
0   7.107E-04   3.809E-04   1.867E-04   9.804E-05   4.738E-05   3.318E-05   2.807E-05   2.539E-05   2.475E-05   1.581E-05
        0.009       0.084       0.275       0.524       1.488       6.981       6.991      10.851      11.148      21.168
      0.00028     0.00259     0.00851     0.01620     0.04605     0.21597     0.21627     0.33567     0.34485     0.65484
0   1.245E-05   1.144E-05   7.239E-06   6.536E-06   5.006E-06   4.115E-06   3.529E-06   3.385E-06   2.292E-06   1.871E-06
       27.329      27.997      43.511      49.003      51.898      51.901      69.047      69.715      80.701      81.369
      0.84543     0.86609     1.34600     1.51592     1.60547     1.60555     2.13598     2.15664     2.49648     2.51715
0   1.547E-06   9.357E-07   5.614E-07   3.743E-07   2.985E-07   2.743E-07   1.791E-07   1.372E-07   1.194E-07   8.230E-08
       84.635      85.897      87.159      87.456      88.421      89.089      90.350      96.140      96.437      99.332
      2.61818     2.65722     2.69625     2.70544     2.73529     2.75595     2.79499     2.97409     2.98328     3.07283
0   5.486E-08
      100.000
      3.09350
0          X/Q PERCENTILES
 (BASED ON THE UPPER ENVELOPE OF THE
 ORDERED X/Q-FREQUENCY VALUES, AND AS
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 PLOTTED ON A LOG-NORMAL GRAPH.)
0 PERCENT OF TIME CHI/Q IS EQUALED OR EXCEEDED
        CHI/Q      WITH RESPECT TO     WHEN THE WIND BLOWS
 SEC/CUBIC METER  THE TOTAL TIME      INTO THIS SECTOR ONLY

                                                          HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 2)=   0.003
                                                          HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 3)=   0.335
                                                          HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 4)=   0.654
                                                          HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 5)=   0.844
                                                          HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 6)=   1.514
                                                          HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 7)=   2.134
                                                          HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 8)=   2.494
     1.076E-04              0.031              1.000
     5.730E-05              0.093              3.000
     4.194E-05              0.155              5.000
     2.682E-05              0.309             10.000
     2.027E-05              0.464             15.000
     1.648E-05              0.619             20.000
     1.354E-05              0.773             25.000
     1.127E-05              0.928             30.000
     9.532E-06              1.083             35.000
     8.223E-06              1.237             40.000
     7.203E-06              1.392             45.000
     6.309E-06              1.547             50.000
     5.330E-06              1.701             55.000
     4.560E-06              1.856             60.000
     3.943E-06              2.011             65.000
     3.400E-06              2.165             70.000
     2.811E-06              2.320             75.000
     2.349E-06              2.475             80.000
0    1.922E-05              0.5               16.16
0ANNUAL AVERAGE =   1.83E-07
1USNRC COMPUTER CODE-PAVAN, VERSION 2.0          RUN DATE: Wed Apr 14 10:41:55 2004

/PLANT NAME: Palisades                           METEOROLOGICAL INSTRUMENTATION
 DATA PERIOD:  1999-2003                         WIND SENSORS HEIGHT: 10 Meters        DT
 TYPE OF RELEASE: Ground Level Release           DELTA-T HEIGHTS: from 10m to 60m
 SOURCE OF DATA: Data from onsite met tower
 COMMENTS: NONE
 PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145
0PARAMETER VALUES FOR THE CHI/Q CALCULATIONS FOR THE WSW SECTOR.
 STABILITY WINDSPEED FREQUENCY DISTANCE TERRAIN HT EFF PLUME HT  SIGMA-Y SIGMA-Z MEANDER-SY  ** CHI/Q VALUES (SEC/CUBIC METER)
   CLASS   METER/SEC  PERCENT   METERS    METERS      METERS      METERS  METERS   METERS        MEANDER   BLDG WAKE        USED
          AT  10.0 METERS                                                                              CA=1006.SQ.METERS

    A         0.1       0.00     4820.        0.          0.       775.2  1000.0    775.2      4.116E-06   4.115E-06   4.115E-06
    A         1.5       1.17     4820.        0.          0.       775.2  1000.0    775.2      2.744E-07   2.743E-07   2.743E-07
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A	3.0	3.94	4820.	0.	0.	775.2	1000.0	775.2	1.372E-07	1.372E-07	1.372E-07
A	5.0	2.14	4820.	0.	0.	775.2	1000.0	775.2	8.233E-08	8.230E-08	8.230E-08
A	7.5	0.62	4820.	0.	0.	775.2	1000.0	775.2	5.489E-08	5.486E-08	5.486E-08
B	3.0	0.62	4820.	0.	0.	583.0	610.6	583.0	2.988E-07	2.985E-07	2.985E-07
B	5.0	1.17	4820.	0.	0.	583.0	610.6	583.0	1.793E-07	1.791E-07	1.791E-07
B	7.5	0.28	4820.	0.	0.	583.0	610.6	583.0	1.195E-07	1.194E-07	1.194E-07
C	0.1	0.00	4820.	0.	0.	442.7	256.1	442.7	2.815E-05	2.807E-05	2.807E-05
C	1.5	0.28	4820.	0.	0.	442.7	256.1	442.7	1.877E-06	1.871E-06	1.871E-06
C	3.0	0.90	4820.	0.	0.	442.7	256.1	442.7	9.384E-07	9.357E-07	9.357E-07
C	5.0	0.90	4820.	0.	0.	442.7	256.1	442.7	5.630E-07	5.614E-07	5.614E-07
C	7.5	0.62	4820.	0.	0.	442.7	256.1	442.7	3.753E-07	3.743E-07	3.743E-07
D	0.1	0.22	4820.	0.	0.	311.7	87.2	373.3	9.804E-05	1.160E-04	9.804E-05
D	1.5	4.83	4820.	0.	0.	311.7	87.2	373.3	6.536E-06	7.736E-06	6.536E-06
D	3.0	13.26	4820.	0.	0.	311.7	87.2	345.6	3.529E-06	3.868E-06	3.529E-06
D	5.0	14.43	4820.	0.	0.	311.7	87.2	319.3	2.292E-06	2.321E-06	2.292E-06
D	7.5	7.53	4820.	0.	0.	311.7	87.2	311.7	1.565E-06	1.547E-06	1.547E-06
E	0.1	0.14	4820.	0.	0.	221.7	55.4	309.2	1.867E-04	2.539E-04	1.867E-04
E	1.5	4.49	4820.	0.	0.	221.7	55.4	309.2	1.245E-05	1.693E-05	1.245E-05
E	3.0	12.63	4820.	0.	0.	221.7	55.4	265.9	7.239E-06	8.463E-06	7.239E-06
E	5.0	3.94	4820.	0.	0.	221.7	55.4	230.7	5.006E-06	5.078E-06	5.006E-06
E	7.5	0.90	4820.	0.	0.	221.7	55.4	221.7	3.473E-06	3.385E-06	3.385E-06
F	0.1	0.06	4820.	0.	0.	153.0	34.5	243.7	3.809E-04	5.719E-04	3.809E-04
F	1.5	3.04	4820.	0.	0.	153.0	34.5	243.7	2.539E-05	3.813E-05	2.539E-05
F	3.0	8.70	4820.	0.	0.	153.0	34.5	195.7	1.581E-05	1.906E-05	1.581E-05
F	5.0	1.17	4820.	0.	0.	153.0	34.5	161.1	1.153E-05	1.144E-05	1.144E-05
G	0.1	0.02	4820.	0.	0.	105.6	21.4	209.9	7.107E-04	1.238E-03	7.107E-04
G	1.5	1.80	4820.	0.	0.	105.6	21.4	209.9	4.738E-05	8.251E-05	4.738E-05
G	3.0	9.32	4820.	0.	0.	105.6	21.4	149.9	3.318E-05	4.126E-05	3.318E-05
G	5.0	0.90	4820.	0.	0.	105.6	21.4	113.1	2.639E-05	2.475E-05	2.475E-05

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1USNRC COMPUTER CODE-PAVAN, VERSION 2.0          RUN DATE: Wed Apr 14 10:41:55 2004

/PLANT NAME: Palisades                           METEOROLOGICAL INSTRUMENTATION
 DATA PERIOD:  1999-2003                         WIND SENSORS HEIGHT: 10 Meters        DT
 TYPE OF RELEASE: Ground Level Release           DELTA-T HEIGHTS: from 10m to 60m
 SOURCE OF DATA: Data from onsite met tower
 COMMENTS: NONE
 PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145
0LOW POPULATION ZONE CALCULATIONS:
0 WSW SECTOR     BOUNDARY DISTANCE = 4820.0 METERS
0LATERAL PLUME MEANDER/BUILDING WAKE CREDIT ALLOWED
 AS A FUNCTION OF DOWNWIND DISTANCE.
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 MEANDER CREDIT IS FOR WINDSPEEDS LESS THAN 6 MPS.
 BUILDING WAKE CREDIT ALLOWED:   C=  0.5     A=  2011.     D=   58.5
 CORRECTION FACTORS USED IN THE ANNUAL AVERAGE CALCULATIONS.
0BELOW ARE PRINTED THE ORDERED VALUES OF CHI/Q AND THE FREQUENCY WITH WHICH THAT VALUE IS REACHED OR EXCEEDED.
 THE TOP NUMBER IS THE CHI/Q.  THE MIDDLE NUMBER IS THE FREQUENCY NORMALIZED TO THIS SECTOR.
 THE THIRD NUMBER IS THE FREQUENCY WITH RESPECT TO ALL TIME.
0   7.107E-04   3.809E-04   1.867E-04   9.804E-05   4.738E-05   3.318E-05   2.807E-05   2.539E-05   2.475E-05   1.581E-05
       0.017       0.076       0.215       0.433       2.229      11.549      11.553      14.591      15.489      24.188
     0.00055     0.00251     0.00715     0.01442     0.07412     0.38411     0.38424     0.48527     0.51512     0.80445
0   1.245E-05   1.144E-05   7.239E-06   6.536E-06   5.006E-06   4.115E-06   3.529E-06   3.385E-06   2.292E-06   1.871E-06
      28.675      29.849      42.484      47.317      51.252      51.257      64.513      65.410      79.840      80.116
     0.95370     0.99273     1.41294     1.57368     1.70456     1.70471     2.14558     2.17543     2.65534     2.66453
0   1.547E-06   9.357E-07   5.614E-07   3.743E-07   2.985E-07   2.743E-07   1.791E-07   1.372E-07   1.194E-07   8.230E-08
      87.642      88.539      89.437      90.058      90.679      91.853      93.027      96.962      97.238      99.379
     2.91481     2.94466     2.97452     2.99518     3.01585     3.05488     3.09392     3.22480     3.23399     3.30517
0   5.486E-08
     100.000
     3.32584
0          X/Q PERCENTILES
 (BASED ON THE UPPER ENVELOPE OF THE
 ORDERED X/Q-FREQUENCY VALUES, AND AS
 PLOTTED ON A LOG-NORMAL GRAPH.)
0 PERCENT OF TIME CHI/Q IS EQUALED OR EXCEEDED
        CHI/Q      WITH RESPECT TO     WHEN THE WIND BLOWS
 SEC/CUBIC METER  THE TOTAL TIME      INTO THIS SECTOR ONLY

                                                          HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 2)=   0.384
                                                          HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 3)=   0.803
                                                          HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 4)=   1.572
                                                          HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 5)=   2.653
                                                          HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 6)=   2.912
     1.225E-04              0.033              1.000
     7.045E-05              0.100              3.000
     5.354E-05              0.166              5.000
     3.613E-05              0.333             10.000
     2.570E-05              0.499             15.000
     1.924E-05              0.665             20.000
     1.516E-05              0.831             25.000
     1.201E-05              0.998             30.000
     9.814E-06              1.164             35.000
     8.214E-06              1.330             40.000
     7.002E-06              1.497             45.000
     5.875E-06              1.663             50.000
     4.876E-06              1.829             55.000
     4.104E-06              1.996             60.000
     3.495E-06              2.162             65.000
     3.007E-06              2.328             70.000
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     2.610E-06              2.494             75.000
     2.273E-06              2.661             80.000
     1.761E-06              2.827             85.000
0    2.565E-05              0.5               15.03
0ANNUAL AVERAGE =   1.89E-07
1USNRC COMPUTER CODE-PAVAN, VERSION 2.0          RUN DATE: Wed Apr 14 10:41:55 2004

/PLANT NAME: Palisades                           METEOROLOGICAL INSTRUMENTATION
 DATA PERIOD:  1999-2003                         WIND SENSORS HEIGHT: 10 Meters        DT
 TYPE OF RELEASE: Ground Level Release           DELTA-T HEIGHTS: from 10m to 60m
 SOURCE OF DATA: Data from onsite met tower
 COMMENTS: NONE
 PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145
0PARAMETER VALUES FOR THE CHI/Q CALCULATIONS FOR THE   W SECTOR.
 STABILITY WINDSPEED FREQUENCY DISTANCE TERRAIN HT EFF PLUME HT  SIGMA-Y SIGMA-Z MEANDER-SY  ** CHI/Q VALUES (SEC/CUBIC METER)
   CLASS   METER/SEC  PERCENT   METERS    METERS      METERS      METERS  METERS   METERS        MEANDER   BLDG WAKE        USED
         AT  10.0 METERS                                                                                CA=1006.SQ.METERS

    A         0.1       0.00     4820.       0.          0.       775.2  1000.0    775.2      4.116E-06   4.115E-06   4.115E-06
    A         1.5       0.48     4820.       0.          0.       775.2  1000.0    775.2      2.744E-07   2.743E-07   2.743E-07
    A         3.0       3.05     4820.       0.          0.       775.2  1000.0    775.2      1.372E-07   1.372E-07   1.372E-07
    A         5.0       3.26     4820.       0.          0.       775.2  1000.0    775.2      8.233E-08   8.230E-08   8.230E-08
    A         7.5       0.69     4820.       0.          0.       775.2  1000.0    775.2      5.489E-08   5.486E-08   5.486E-08
    A        10.0       0.21     4820.       0.          0.       775.2  1000.0    775.2      4.116E-08   4.115E-08   4.115E-08

    B         0.1       0.00     4820.       0.          0.       583.0   610.6    583.0      8.964E-06   8.956E-06   8.956E-06
    B         1.5       0.21     4820.       0.          0.       583.0   610.6    583.0      5.976E-07   5.971E-07   5.971E-07
    B         3.0       0.48     4820.       0.          0.       583.0   610.6    583.0      2.988E-07   2.985E-07   2.985E-07
    B         5.0       0.91     4820.       0.          0.       583.0   610.6    583.0      1.793E-07   1.791E-07   1.791E-07
    B         7.5       0.48     4820.       0.          0.       583.0   610.6    583.0      1.195E-07   1.194E-07   1.194E-07
    B        10.0       0.21     4820.       0.          0.       583.0   610.6    583.0      8.964E-08   8.956E-08   8.956E-08

    C         3.0       0.69     4820.       0.          0.       442.7   256.1    442.7      9.384E-07   9.357E-07   9.357E-07
    C         5.0       1.66     4820.       0.          0.       442.7   256.1    442.7      5.630E-07   5.614E-07   5.614E-07
    C         7.5       0.69     4820.       0.          0.       442.7   256.1    442.7      3.753E-07   3.743E-07   3.743E-07

    D         0.1       0.14     4820.       0.          0.       311.7    87.2    373.3      9.804E-05   1.160E-04   9.804E-05
    D         1.5       3.05     4820.       0.          0.       311.7    87.2    373.3      6.536E-06   7.736E-06   6.536E-06
    D         3.0       9.78     4820.       0.          0.       311.7    87.2    345.6      3.529E-06   3.868E-06   3.529E-06
    D         5.0      14.21     4820.       0.          0.       311.7    87.2    319.3      2.292E-06   2.321E-06   2.292E-06
    D         7.5       7.91     4820.       0.          0.       311.7    87.2    311.7      1.565E-06   1.547E-06   1.547E-06
    D        10.0       1.39     4820.       0.          0.       311.7    87.2    311.7      1.174E-06   1.160E-06   1.160E-06

    E         0.1       0.10     4820.       0.          0.       221.7    55.4    309.2      1.867E-04   2.539E-04   1.867E-04
    E         1.5       3.26     4820.       0.          0.       221.7    55.4    309.2      1.245E-05   1.693E-05   1.245E-05
    E         3.0      10.47     4820.       0.          0.       221.7    55.4    265.9      7.239E-06   8.463E-06   7.239E-06
    E         5.0       8.17     4820.       0.          0.       221.7    55.4    230.7      5.006E-06   5.078E-06   5.006E-06
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    E         7.5       1.66     4820.        0.          0.       221.7    55.4    221.7      3.473E-06   3.385E-06   3.385E-06
    E        10.0       0.48     4820.        0.          0.       221.7    55.4    221.7      2.605E-06   2.539E-06   2.539E-06

    F         0.1       0.05     4820.        0.          0.       153.0    34.5    243.7      3.809E-04   5.719E-04   3.809E-04
    F         1.5       2.78     4820.        0.          0.       153.0    34.5    243.7      2.539E-05   3.813E-05   2.539E-05
    F         3.0       9.56     4820.        0.          0.       153.0    34.5    195.7      1.581E-05   1.906E-05   1.581E-05
    F         5.0       1.87     4820.        0.          0.       153.0    34.5    161.1      1.153E-05   1.144E-05   1.144E-05
    F        10.0       0.21     4820.        0.          0.       153.0    34.5    153.0      6.066E-06   5.719E-06   5.719E-06

    G         0.1       0.02     4820.        0.          0.       105.6    21.4    209.9      7.107E-04   1.238E-03   7.107E-04
    G         1.5       1.87     4820.        0.          0.       105.6    21.4    209.9      4.738E-05   8.251E-05   4.738E-05
    G         3.0       9.08     4820.        0.          0.       105.6    21.4    149.9      3.318E-05   4.126E-05   3.318E-05
    G         5.0       0.91     4820.        0.          0.       105.6    21.4    113.1      2.639E-05   2.475E-05   2.475E-05
1USNRC COMPUTER CODE-PAVAN, VERSION 2.0          RUN DATE: Wed Apr 14 10:41:55 2004

/PLANT NAME: Palisades                           METEOROLOGICAL INSTRUMENTATION
 DATA PERIOD:  1999-2003                         WIND SENSORS HEIGHT: 10 Meters        DT
 TYPE OF RELEASE: Ground Level Release           DELTA-T HEIGHTS: from 10m to 60m
 SOURCE OF DATA: Data from onsite met tower
 COMMENTS: NONE
 PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145
0LOW POPULATION ZONE CALCULATIONS:
0   W SECTOR     BOUNDARY DISTANCE = 4820.0 METERS
0LATERAL PLUME MEANDER/BUILDING WAKE CREDIT ALLOWED
 AS A FUNCTION OF DOWNWIND DISTANCE.
 MEANDER CREDIT IS FOR WINDSPEEDS LESS THAN 6 MPS.
 BUILDING WAKE CREDIT ALLOWED:   C=  0.5     A=  2011.     D=   58.5
 CORRECTION FACTORS USED IN THE ANNUAL AVERAGE CALCULATIONS.
0BELOW ARE PRINTED THE ORDERED VALUES OF CHI/Q AND THE FREQUENCY WITH WHICH THAT VALUE IS REACHED OR EXCEEDED.
 THE TOP NUMBER IS THE CHI/Q.  THE MIDDLE NUMBER IS THE FREQUENCY NORMALIZED TO THIS SECTOR.
 THE THIRD NUMBER IS THE FREQUENCY WITH RESPECT TO ALL TIME.
0   7.107E-04   3.809E-04   1.867E-04   9.804E-05   4.738E-05   3.318E-05   2.539E-05   2.475E-05   1.581E-05   1.245E-05
        0.017       0.071       0.172       0.310       2.180      11.262      14.040      14.948      24.510      27.769
      0.00074     0.00306     0.00741     0.01333     0.09369     0.48405     0.60345     0.64249     1.05351     1.19358
0   1.144E-05   8.956E-06   7.239E-06   6.536E-06   5.719E-06   5.006E-06   4.115E-06   3.529E-06   3.385E-06   2.539E-06
       29.639      29.641      40.112      43.157      43.370      51.544      51.546      61.322      62.978      63.459
      1.27395     1.27402     1.72408     1.85496     1.86415     2.21547     2.21555     2.63575     2.70694     2.72760
0   2.292E-06   1.547E-06   1.160E-06   9.357E-07   5.971E-07   5.614E-07   3.743E-07   2.985E-07   2.743E-07   1.791E-07
       77.669      85.576      86.965      87.659      87.873      89.529      90.224      90.704      91.185      92.093
      3.33839     3.67823     3.73794     3.76779     3.77697     3.84815     3.87800     3.89867     3.91934     3.95837
0   1.372E-07   1.194E-07   8.956E-08   8.230E-08   5.486E-08   4.115E-08
       95.139      95.619      95.833      99.092      99.786     100.000
      4.08926     4.10992     4.11911     4.25918     4.28903     4.29821
0          X/Q PERCENTILES
 (BASED ON THE UPPER ENVELOPE OF THE
 ORDERED X/Q-FREQUENCY VALUES, AND AS
 PLOTTED ON A LOG-NORMAL GRAPH.)
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0 PERCENT OF TIME CHI/Q IS EQUALED OR EXCEEDED
        CHI/Q      WITH RESPECT TO     WHEN THE WIND BLOWS
 SEC/CUBIC METER  THE TOTAL TIME      INTO THIS SECTOR ONLY

                                                        HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 2)=   0.483
                                                        HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 3)=   1.052
                                                        HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 4)=   2.213
                                                        HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 5)=   3.335
                                                        HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 6)=   3.675
     1.230E-04              0.043              1.000
     7.024E-05              0.129              3.000
     5.317E-05              0.215              5.000
     3.564E-05              0.430             10.000
     2.544E-05              0.645             15.000
     1.932E-05              0.860             20.000
     1.535E-05              1.075             25.000
     1.170E-05              1.289             30.000
     9.249E-06              1.504             35.000
     7.514E-06              1.719             40.000
     6.234E-06              1.934             45.000
     5.260E-06              2.149             50.000
     4.439E-06              2.364             55.000
     3.771E-06              2.579             60.000
     3.239E-06              2.794             65.000
     2.809E-06              3.009             70.000
     2.455E-06              3.224             75.000
     2.035E-06              3.439             80.000
     1.591E-06              3.653             85.000
0    3.221E-05              0.5               11.63
0ANNUAL AVERAGE =   2.21E-07
1USNRC COMPUTER CODE-PAVAN, VERSION 2.0          RUN DATE: Wed Apr 14 10:41:55 2004

/PLANT NAME: Palisades                           METEOROLOGICAL INSTRUMENTATION
 DATA PERIOD:  1999-2003                         WIND SENSORS HEIGHT: 10 Meters        DT
 TYPE OF RELEASE: Ground Level Release           DELTA-T HEIGHTS: from 10m to 60m
 SOURCE OF DATA: Data from onsite met tower
 COMMENTS: NONE
 PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145
0PARAMETER VALUES FOR THE CHI/Q CALCULATIONS FOR THE WNW SECTOR.
 STABILITY WINDSPEED FREQUENCY DISTANCE TERRAIN HT EFF PLUME HT  SIGMA-Y SIGMA-Z MEANDER-SY  ** CHI/Q VALUES (SEC/CUBIC METER)
   CLASS   METER/SEC  PERCENT   METERS    METERS      METERS      METERS  METERS   METERS        MEANDER   BLDG WAKE        USED
         AT  10.0 METERS                                                                                 CA=1006.SQ.METERS

    A         0.1       0.00     4820.        0.          0.       775.2  1000.0    775.2      4.116E-06   4.115E-06   4.115E-06
    A         1.5       0.52     4820.        0.          0.       775.2  1000.0    775.2      2.744E-07   2.743E-07   2.743E-07
    A         3.0       2.96     4820.        0.          0.       775.2  1000.0    775.2      1.372E-07   1.372E-07   1.372E-07
    A         5.0       4.36     4820.        0.          0.       775.2  1000.0    775.2      8.233E-08   8.230E-08   8.230E-08
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A	7.5	1.04	4820.	0.	0.	775.2	1000.0	775.2	5.489E-08	5.486E-08	5.486E-08
B	0.1	0.00	4820.	0.	0.	583.0	610.6	583.0	8.964E-06	8.956E-06	8.956E-06
B	1.5	0.16	4820.	0.	0.	583.0	610.6	583.0	5.976E-07	5.971E-07	5.971E-07
B	3.0	0.52	4820.	0.	0.	583.0	610.6	583.0	2.988E-07	2.985E-07	2.985E-07
B	5.0	1.24	4820.	0.	0.	583.0	610.6	583.0	1.793E-07	1.791E-07	1.791E-07
B	7.5	0.36	4820.	0.	0.	583.0	610.6	583.0	1.195E-07	1.194E-07	1.194E-07
B	10.0	0.16	4820.	0.	0.	583.0	610.6	583.0	8.964E-08	8.956E-08	8.956E-08
C	0.1	0.00	4820.	0.	0.	442.7	256.1	442.7	2.815E-05	2.807E-05	2.807E-05
C	1.5	0.16	4820.	0.	0.	442.7	256.1	442.7	1.877E-06	1.871E-06	1.871E-06
C	3.0	0.52	4820.	0.	0.	442.7	256.1	442.7	9.384E-07	9.357E-07	9.357E-07
C	5.0	1.56	4820.	0.	0.	442.7	256.1	442.7	5.630E-07	5.614E-07	5.614E-07
C	7.5	1.04	4820.	0.	0.	442.7	256.1	442.7	3.753E-07	3.743E-07	3.743E-07
C	10.0	0.16	4820.	0.	0.	442.7	256.1	442.7	2.815E-07	2.807E-07	2.807E-07
D	0.1	0.09	4820.	0.	0.	311.7	87.2	373.3	9.804E-05	1.160E-04	9.804E-05
D	1.5	1.92	4820.	0.	0.	311.7	87.2	373.3	6.536E-06	7.736E-06	6.536E-06
D	3.0	6.44	4820.	0.	0.	311.7	87.2	345.6	3.529E-06	3.868E-06	3.529E-06
D	5.0	14.63	4820.	0.	0.	311.7	87.2	319.3	2.292E-06	2.321E-06	2.292E-06
D	7.5	11.52	4820.	0.	0.	311.7	87.2	311.7	1.565E-06	1.547E-06	1.547E-06
D	10.0	2.44	4820.	0.	0.	311.7	87.2	311.7	1.174E-06	1.160E-06	1.160E-06
D	15.0	0.36	4820.	0.	0.	311.7	87.2	311.7	7.827E-07	7.736E-07	7.736E-07
E	0.1	0.10	4820.	0.	0.	221.7	55.4	309.2	1.867E-04	2.539E-04	1.867E-04
E	1.5	3.12	4820.	0.	0.	221.7	55.4	309.2	1.245E-05	1.693E-05	1.245E-05
E	3.0	8.72	4820.	0.	0.	221.7	55.4	265.9	7.239E-06	8.463E-06	7.239E-06
E	5.0	8.36	4820.	0.	0.	221.7	55.4	230.7	5.006E-06	5.078E-06	5.006E-06
E	7.5	2.28	4820.	0.	0.	221.7	55.4	221.7	3.473E-06	3.385E-06	3.385E-06
E	10.0	0.68	4820.	0.	0.	221.7	55.4	221.7	2.605E-06	2.539E-06	2.539E-06
E	14.9	0.16	4820.	0.	0.	221.7	55.4	221.7	1.737E-06	1.693E-06	1.693E-06
F	0.1	0.04	4820.	0.	0.	153.0	34.5	243.7	3.809E-04	5.719E-04	3.809E-04
F	1.5	2.08	4820.	0.	0.	153.0	34.5	243.7	2.539E-05	3.813E-05	2.539E-05
F	3.0	7.84	4820.	0.	0.	153.0	34.5	195.7	1.581E-05	1.906E-05	1.581E-05
F	5.0	1.56	4820.	0.	0.	153.0	34.5	161.1	1.153E-05	1.144E-05	1.144E-05
G	0.1	0.01	4820.	0.	0.	105.6	21.4	209.9	7.107E-04	1.238E-03	7.107E-04
G	1.5	1.40	4820.	0.	0.	105.6	21.4	209.9	4.738E-05	8.251E-05	4.738E-05
G	3.0	10.12	4820.	0.	0.	105.6	21.4	149.9	3.318E-05	4.126E-05	3.318E-05
G	5.0	1.40	4820.	0.	0.	105.6	21.4	113.1	2.639E-05	2.475E-05	2.475E-05

1USNRC COMPUTER CODE-PAVAN, VERSION 2.0 RUN DATE: Wed Apr 14 10:41:55 2004

/PLANT NAME: Palisades METEOROLOGICAL INSTRUMENTATION
DATA PERIOD: 1999-2003 WIND SENSORS HEIGHT: 10 Meters DT
TYPE OF RELEASE: Ground Level Release DELTA-T HEIGHTS: from 10m to 60m
SOURCE OF DATA: Data from onsite met tower

```
 COMMENTS: NONE
 PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145
0LOW POPULATION ZONE CALCULATIONS:
0 WNW SECTOR     BOUNDARY DISTANCE = 4820.0 METERS
0LATERAL PLUME MEANDER/BUILDING WAKE CREDIT ALLOWED
 AS A FUNCTION OF DOWNWIND DISTANCE.
 MEANDER CREDIT IS FOR WINDSPEEDS LESS THAN 6 MPS.
 BUILDING WAKE CREDIT ALLOWED:   C=  0.5     A=  2011.     D=   58.5
 CORRECTION FACTORS USED IN THE ANNUAL AVERAGE CALCULATIONS.
0BELOW ARE PRINTED THE ORDERED VALUES OF CHI/Q AND THE FREQUENCY WITH WHICH THAT VALUE IS REACHED OR EXCEEDED.
 THE TOP NUMBER IS THE CHI/Q.  THE MIDDLE NUMBER IS THE FREQUENCY NORMALIZED TO THIS SECTOR.
 THE THIRD NUMBER IS THE FREQUENCY WITH RESPECT TO ALL TIME.
0   7.107E-04   3.809E-04   1.867E-04   9.804E-05   4.738E-05   3.318E-05   2.807E-05   2.539E-05   2.475E-05   1.581E-05
        0.013       0.053       0.150       0.237       1.636      11.752      11.754      13.833      15.233      23.069
      0.00074     0.00306     0.00862     0.01361     0.09397     0.67491     0.67505     0.79445     0.87482     1.32487
0   1.245E-05   1.144E-05   8.956E-06   7.239E-06   6.536E-06   5.006E-06   4.115E-06   3.529E-06   3.385E-06   2.539E-06
       26.188      27.747      27.749      36.465      38.384      46.741      46.743      53.180      55.459      56.139
      1.50398     1.59353     1.59360     2.09418     2.20440     2.68431     2.68442     3.05411     3.18499     3.22403
0   2.292E-06   1.871E-06   1.693E-06   1.547E-06   1.160E-06   9.357E-07   7.736E-07   5.971E-07   5.614E-07   3.743E-07
       70.772      70.932      71.092      82.607      85.046      85.566      85.926      86.086      87.645      88.685
      4.06444     4.07363     4.08281     4.74412     4.88419     4.91404     4.93471     4.94389     5.03344     5.09315
0   2.985E-07   2.807E-07   2.743E-07   1.791E-07   1.372E-07   1.194E-07   8.956E-08   8.230E-08   5.486E-08
       89.205      89.365      89.884      91.124      94.083      94.442      94.602      98.960     100.000
      5.12300     5.13218     5.16203     5.23321     5.40313     5.42380     5.43299     5.68327     5.74297
0          X/Q PERCENTILES
 (BASED ON THE UPPER ENVELOPE OF THE
 ORDERED X/Q-FREQUENCY VALUES, AND AS
 PLOTTED ON A LOG-NORMAL GRAPH.)
0 PERCENT OF TIME CHI/Q IS EQUALED OR EXCEEDED
        CHI/Q      WITH RESPECT TO     WHEN THE WIND BLOWS
 SEC/CUBIC METER  THE TOTAL TIME      INTO THIS SECTOR ONLY

                                                    HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 2)=   0.674
                                                    HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 3)=   1.323
                                                    HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 4)=   2.682
                                                    HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 5)=   4.061
                                                    HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 6)=   4.740
     1.201E-04             0.057             1.000
     7.014E-05             0.172             3.000
     5.365E-05             0.287             5.000
     3.646E-05             0.574            10.000
     2.556E-05             0.861            15.000
     1.859E-05             1.149            20.000
     1.395E-05             1.436            25.000
     1.045E-05             1.723            30.000
     8.138E-06             2.010            35.000
     6.521E-06             2.297            40.000
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     5.343E-06              2.584             45.000
     4.426E-06              2.871             50.000
     3.710E-06              3.159             55.000
     3.150E-06              3.446             60.000
     2.703E-06              3.733             65.000
     2.342E-06              4.020             70.000
     1.981E-06              4.307             75.000
     1.680E-06              4.594             80.000
0    3.947E-05              0.5                8.71
0ANNUAL AVERAGE =   2.61E-07
1USNRC COMPUTER CODE-PAVAN, VERSION 2.0          RUN DATE: Wed Apr 14 10:41:55 2004

/PLANT NAME: Palisades                           METEOROLOGICAL INSTRUMENTATION
 DATA PERIOD:  1999-2003                         WIND SENSORS HEIGHT: 10 Meters       DT
 TYPE OF RELEASE: Ground Level Release           DELTA-T HEIGHTS: from 10m to 60m
 SOURCE OF DATA: Data from onsite met tower
 COMMENTS: NONE
 PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145
0PARAMETER VALUES FOR THE CHI/Q CALCULATIONS FOR THE  NW SECTOR.
 STABILITY WINDSPEED FREQUENCY DISTANCE TERRAIN HT EFF PLUME HT  SIGMA-Y SIGMA-Z MEANDER-SY  ** CHI/Q VALUES (SEC/CUBIC METER)
   CLASS   METER/SEC  PERCENT   METERS    METERS      METERS      METERS  METERS   METERS        MEANDER   BLDG WAKE        USED
         AT  10.0 METERS                                                                              CA=1006.SQ.METERS

    A         0.1       0.00     4820.        0.          0.       775.2  1000.0    775.2      4.116E-06   4.115E-06   4.115E-06
    A         1.5       0.37     4820.        0.          0.       775.2  1000.0    775.2      2.744E-07   2.743E-07   2.743E-07
    A         3.0       2.63     4820.        0.          0.       775.2  1000.0    775.2      1.372E-07   1.372E-07   1.372E-07
    A         5.0       4.98     4820.        0.          0.       775.2  1000.0    775.2      8.233E-08   8.230E-08   8.230E-08
    A         7.5       1.49     4820.        0.          0.       775.2  1000.0    775.2      5.489E-08   5.486E-08   5.486E-08
    A        10.0       0.26     4820.        0.          0.       775.2  1000.0    775.2      4.116E-08   4.115E-08   4.115E-08

    B         3.0       0.49     4820.        0.          0.       583.0   610.6    583.0      2.988E-07   2.985E-07   2.985E-07
    B         5.0       1.26     4820.        0.          0.       583.0   610.6    583.0      1.793E-07   1.791E-07   1.791E-07
    B         7.5       0.63     4820.        0.          0.       583.0   610.6    583.0      1.195E-07   1.194E-07   1.194E-07
    B        10.0       0.11     4820.        0.          0.       583.0   610.6    583.0      8.964E-08   8.956E-08   8.956E-08

    C         3.0       0.49     4820.        0.          0.       442.7   256.1    442.7      9.384E-07   9.357E-07   9.357E-07
    C         5.0       1.86     4820.        0.          0.       442.7   256.1    442.7      5.630E-07   5.614E-07   5.614E-07
    C         7.5       1.00     4820.        0.          0.       442.7   256.1    442.7      3.753E-07   3.743E-07   3.743E-07
    C        10.0       0.11     4820.        0.          0.       442.7   256.1    442.7      2.815E-07   2.807E-07   2.807E-07

    D         0.1       0.06     4820.        0.          0.       311.7    87.2    373.3      9.804E-05   1.160E-04   9.804E-05
    D         1.5       1.37     4820.        0.          0.       311.7    87.2    373.3      6.536E-06   7.736E-06   6.536E-06
    D         3.0       6.61     4820.        0.          0.       311.7    87.2    345.6      3.529E-06   3.868E-06   3.529E-06
    D         5.0      12.47     4820.        0.          0.       311.7    87.2    319.3      2.292E-06   2.321E-06   2.292E-06
    D         7.5       8.35     4820.        0.          0.       311.7    87.2    311.7      1.565E-06   1.547E-06   1.547E-06
    D        10.0       1.63     4820.        0.          0.       311.7    87.2    311.7      1.174E-06   1.160E-06   1.160E-06
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    E         0.1       0.07     4820.        0.          0.       221.7    55.4    309.2      1.867E-04   2.539E-04   1.867E-04
    E         1.5       2.37     4820.        0.          0.       221.7    55.4    309.2      1.245E-05   1.693E-05   1.245E-05
    E         3.0       9.21     4820.        0.          0.       221.7    55.4    265.9      7.239E-06   8.463E-06   7.239E-06
    E         5.0       9.72     4820.        0.          0.       221.7    55.4    230.7      5.006E-06   5.078E-06   5.006E-06
    E         7.5       3.49     4820.        0.          0.       221.7    55.4    221.7      3.473E-06   3.385E-06   3.385E-06
    E        10.0       0.49     4820.        0.          0.       221.7    55.4    221.7      2.605E-06   2.539E-06   2.539E-06

    F         0.1       0.04     4820.        0.          0.       153.0    34.5    243.7      3.809E-04   5.719E-04   3.809E-04
    F         1.5       2.23     4820.        0.          0.       153.0    34.5    243.7      2.539E-05   3.813E-05   2.539E-05
    F         3.0       7.86     4820.        0.          0.       153.0    34.5    195.7      1.581E-05   1.906E-05   1.581E-05
    F         5.0       2.75     4820.        0.          0.       153.0    34.5    161.1      1.153E-05   1.144E-05   1.144E-05

    G         0.1       0.01     4820.        0.          0.       105.6    21.4    209.9      7.107E-04   1.238E-03   7.107E-04
    G         1.5       1.37     4820.        0.          0.       105.6    21.4    209.9      4.738E-05   8.251E-05   4.738E-05
    G         3.0      13.21     4820.        0.          0.       105.6    21.4    149.9      3.318E-05   4.126E-05   3.318E-05
    G         5.0       1.00     4820.        0.          0.       105.6    21.4    113.1      2.639E-05   2.475E-05   2.475E-05
1USNRC COMPUTER CODE-PAVAN, VERSION 2.0          RUN DATE: Wed Apr 14 10:41:55 2004

/PLANT NAME: Palisades                           METEOROLOGICAL INSTRUMENTATION
 DATA PERIOD:  1999-2003                         WIND SENSORS HEIGHT: 10 Meters        DT
 TYPE OF RELEASE: Ground Level Release           DELTA-T HEIGHTS: from 10m to 60m
 SOURCE OF DATA: Data from onsite met tower
 COMMENTS: NONE
 PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145
0LOW POPULATION ZONE CALCULATIONS:
0  NW SECTOR     BOUNDARY DISTANCE = 4820.0 METERS
0LATERAL PLUME MEANDER/BUILDING WAKE CREDIT ALLOWED
 AS A FUNCTION OF DOWNWIND DISTANCE.
 MEANDER CREDIT IS FOR WINDSPEEDS LESS THAN 6 MPS.
 BUILDING WAKE CREDIT ALLOWED:   C=  0.5     A=  2011.     D=   58.5
 CORRECTION FACTORS USED IN THE ANNUAL AVERAGE CALCULATIONS.
0BELOW ARE PRINTED THE ORDERED VALUES OF CHI/Q AND THE FREQUENCY WITH WHICH THAT VALUE IS REACHED OR EXCEEDED.
 THE TOP NUMBER IS THE CHI/Q.  THE MIDDLE NUMBER IS THE FREQUENCY NORMALIZED TO THIS SECTOR.
 THE THIRD NUMBER IS THE FREQUENCY WITH RESPECT TO ALL TIME.
0   7.107E-04   3.809E-04   1.867E-04   9.804E-05   4.738E-05   3.318E-05   2.539E-05   2.475E-05   1.581E-05   1.245E-05
        0.013       0.056       0.130       0.192       1.564      14.777      17.007      18.008      25.873      28.246
      0.00102     0.00449     0.01041     0.01540     0.12561     1.18646     1.36557     1.44594     2.07739     2.26798
0   1.144E-05   7.239E-06   6.536E-06   5.006E-06   4.115E-06   3.529E-06   3.385E-06   2.539E-06   2.292E-06   1.547E-06
       30.992      40.200      41.573      51.296      51.298      57.904      61.393      61.879      74.348      82.698
      2.48841     3.22779     3.33801     4.11872     4.11884     4.64926     4.92940     4.96844     5.96959     6.64008
0   1.160E-06   9.357E-07   5.614E-07   3.743E-07   2.985E-07   2.807E-07   2.743E-07   1.791E-07   1.372E-07   1.194E-07
       84.328      84.814      86.673      87.674      88.160      88.275      88.647      89.905      92.536      93.165
      6.77096     6.81000     6.95925     7.03962     7.07866     7.08784     7.11769     7.21873     7.42998     7.48049
0   8.956E-08   8.230E-08   5.486E-08   4.115E-08
       93.279      98.256      99.743     100.000
      7.48968     7.88922     8.00862     8.02929
0          X/Q PERCENTILES
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 (BASED ON THE UPPER ENVELOPE OF THE
 ORDERED X/Q-FREQUENCY VALUES, AND AS
 PLOTTED ON A LOG-NORMAL GRAPH.)
0 PERCENT OF TIME CHI/Q IS EQUALED OR EXCEEDED
        CHI/Q      WITH RESPECT TO     WHEN THE WIND BLOWS
 SEC/CUBIC METER  THE TOTAL TIME      INTO THIS SECTOR ONLY

                                                    HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 2)=   1.185
                                                    HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 3)=   2.075
                                                    HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 4)=   4.115
                                                    HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 5)=   5.966
                                                    HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 6)=   6.636
     1.305E-04              0.080              1.000
     7.797E-05              0.241              3.000
     6.026E-05              0.401              5.000
     4.151E-05              0.803             10.000
     3.255E-05              1.204             15.000
     2.239E-05              1.606             20.000
     1.657E-05              2.007             25.000
     1.246E-05              2.409             30.000
     9.672E-06              2.810             35.000
     7.723E-06              3.212             40.000
     6.305E-06              3.613             45.000
     5.239E-06              4.015             50.000
     4.342E-06              4.416             55.000
     3.625E-06              4.818             60.000
     3.062E-06              5.219             65.000
     2.613E-06              5.621             70.000
     2.220E-06              6.022             75.000
     1.751E-06              6.423             80.000
0    5.372E-05              0.5                6.23
0ANNUAL AVERAGE =   3.72E-07
1USNRC COMPUTER CODE-PAVAN, VERSION 2.0          RUN DATE: Wed Apr 14 10:41:55 2004

/PLANT NAME: Palisades                           METEOROLOGICAL INSTRUMENTATION
 DATA PERIOD:  1999-2003                         WIND SENSORS HEIGHT: 10 Meters        DT
 TYPE OF RELEASE: Ground Level Release           DELTA-T HEIGHTS: from 10m to 60m
 SOURCE OF DATA: Data from onsite met tower
 COMMENTS: NONE
 PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145
0PARAMETER VALUES FOR THE CHI/Q CALCULATIONS FOR THE NNW SECTOR.
 STABILITY WINDSPEED FREQUENCY DISTANCE TERRAIN HT EFF PLUME HT  SIGMA-Y SIGMA-Z MEANDER-SY  ** CHI/Q VALUES (SEC/CUBIC METER)
   CLASS   METER/SEC  PERCENT   METERS    METERS      METERS      METERS  METERS   METERS        MEANDER   BLDG WAKE        USED
          AT  10.0 METERS                                                                              CA=1006.SQ.METERS

    A         0.1       0.00     4820.        0.          0.       775.2  1000.0    775.2      4.116E-06   4.115E-06   4.115E-06
    A         1.5       0.47     4820.        0.          0.       775.2  1000.0    775.2      2.744E-07   2.743E-07   2.743E-07
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A	3.0	4.18	4820.	0.	0.	775.2	1000.0	775.2	1.372E-07	1.372E-07	1.372E-07
A	5.0	4.09	4820.	0.	0.	775.2	1000.0	775.2	8.233E-08	8.230E-08	8.230E-08
A	7.5	1.11	4820.	0.	0.	775.2	1000.0	775.2	5.489E-08	5.486E-08	5.486E-08
A	10.0	0.19	4820.	0.	0.	775.2	1000.0	775.2	4.116E-08	4.115E-08	4.115E-08
B	0.1	0.00	4820.	0.	0.	583.0	610.6	583.0	8.964E-06	8.956E-06	8.956E-06
B	1.5	0.19	4820.	0.	0.	583.0	610.6	583.0	5.976E-07	5.971E-07	5.971E-07
B	3.0	0.55	4820.	0.	0.	583.0	610.6	583.0	2.988E-07	2.985E-07	2.985E-07
B	5.0	0.94	4820.	0.	0.	583.0	610.6	583.0	1.793E-07	1.791E-07	1.791E-07
B	7.5	0.28	4820.	0.	0.	583.0	610.6	583.0	1.195E-07	1.194E-07	1.194E-07
C	0.1	0.00	4820.	0.	0.	442.7	256.1	442.7	2.815E-05	2.807E-05	2.807E-05
C	1.5	0.09	4820.	0.	0.	442.7	256.1	442.7	1.877E-06	1.871E-06	1.871E-06
C	3.0	0.83	4820.	0.	0.	442.7	256.1	442.7	9.384E-07	9.357E-07	9.357E-07
C	5.0	1.39	4820.	0.	0.	442.7	256.1	442.7	5.630E-07	5.614E-07	5.614E-07
C	7.5	0.66	4820.	0.	0.	442.7	256.1	442.7	3.753E-07	3.743E-07	3.743E-07
D	0.1	0.08	4820.	0.	0.	311.7	87.2	373.3	9.804E-05	1.160E-04	9.804E-05
D	1.5	1.66	4820.	0.	0.	311.7	87.2	373.3	6.536E-06	7.736E-06	6.536E-06
D	3.0	8.08	4820.	0.	0.	311.7	87.2	345.6	3.529E-06	3.868E-06	3.529E-06
D	5.0	12.06	4820.	0.	0.	311.7	87.2	319.3	2.292E-06	2.321E-06	2.292E-06
D	7.5	5.28	4820.	0.	0.	311.7	87.2	311.7	1.565E-06	1.547E-06	1.547E-06
D	10.0	0.47	4820.	0.	0.	311.7	87.2	311.7	1.174E-06	1.160E-06	1.160E-06
E	0.1	0.10	4820.	0.	0.	221.7	55.4	309.2	1.867E-04	2.539E-04	1.867E-04
E	1.5	3.07	4820.	0.	0.	221.7	55.4	309.2	1.245E-05	1.693E-05	1.245E-05
E	3.0	11.89	4820.	0.	0.	221.7	55.4	265.9	7.239E-06	8.463E-06	7.239E-06
E	5.0	9.76	4820.	0.	0.	221.7	55.4	230.7	5.006E-06	5.078E-06	5.006E-06
E	7.5	2.51	4820.	0.	0.	221.7	55.4	221.7	3.473E-06	3.385E-06	3.385E-06
E	10.0	0.28	4820.	0.	0.	221.7	55.4	221.7	2.605E-06	2.539E-06	2.539E-06
F	0.1	0.05	4820.	0.	0.	153.0	34.5	243.7	3.809E-04	5.719E-04	3.809E-04
F	1.5	2.60	4820.	0.	0.	153.0	34.5	243.7	2.539E-05	3.813E-05	2.539E-05
F	3.0	8.74	4820.	0.	0.	153.0	34.5	195.7	1.581E-05	1.906E-05	1.581E-05
F	5.0	1.96	4820.	0.	0.	153.0	34.5	161.1	1.153E-05	1.144E-05	1.144E-05
G	0.1	0.02	4820.	0.	0.	105.6	21.4	209.9	7.107E-04	1.238E-03	7.107E-04
G	1.5	2.24	4820.	0.	0.	105.6	21.4	209.9	4.738E-05	8.251E-05	4.738E-05
G	3.0	12.81	4820.	0.	0.	105.6	21.4	149.9	3.318E-05	4.126E-05	3.318E-05
G	5.0	1.39	4820.	0.	0.	105.6	21.4	113.1	2.639E-05	2.475E-05	2.475E-05

1USNRC COMPUTER CODE-PAVAN, VERSION 2.0 RUN DATE: Wed Apr 14 10:41:55 2004

/PLANT NAME: Palisades METEOROLOGICAL INSTRUMENTATION
DATA PERIOD: 1999-2003 WIND SENSORS HEIGHT: 10 Meters DT
TYPE OF RELEASE: Ground Level Release DELTA-T HEIGHTS: from 10m to 60m
SOURCE OF DATA: Data from onsite met tower
COMMENTS: NONE

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 PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145
0LOW POPULATION ZONE CALCULATIONS:
0 NNW SECTOR     BOUNDARY DISTANCE = 4820.0 METERS
0LATERAL PLUME MEANDER/BUILDING WAKE CREDIT ALLOWED
 AS A FUNCTION OF DOWNWIND DISTANCE.
 MEANDER CREDIT IS FOR WINDSPEEDS LESS THAN 6 MPS.
 BUILDING WAKE CREDIT ALLOWED:   C=  0.5     A=  2011.     D=   58.5
 CORRECTION FACTORS USED IN THE ANNUAL AVERAGE CALCULATIONS.
0BELOW ARE PRINTED THE ORDERED VALUES OF CHI/Q AND THE FREQUENCY WITH WHICH THAT VALUE IS REACHED OR EXCEEDED.
 THE TOP NUMBER IS THE CHI/Q.  THE MIDDLE NUMBER IS THE FREQUENCY NORMALIZED TO THIS SECTOR.
 THE THIRD NUMBER IS THE FREQUENCY WITH RESPECT TO ALL TIME.
0   7.107E-04   3.809E-04   1.867E-04   9.804E-05   4.738E-05   3.318E-05   2.807E-05   2.539E-05   2.475E-05   1.581E-05
        0.021       0.071       0.166       0.242       2.479      15.287      15.288      17.888      19.273      28.010
      0.00222     0.00766     0.01793     0.02603     0.26713     1.64715     1.64729     1.92742     2.07668     3.01813
0   1.245E-05   1.144E-05   8.956E-06   7.239E-06   6.536E-06   5.006E-06   4.115E-06   3.529E-06   3.385E-06   2.539E-06
       31.079      33.039      33.041      44.932      46.594      56.355      56.356      64.433      66.948      67.225
      3.34878     3.56003     3.56020     4.84148     5.02059     6.07225     6.07245     6.94271     7.21366     7.24352
0   2.292E-06   1.871E-06   1.547E-06   1.160E-06   9.357E-07   5.971E-07   5.614E-07   3.743E-07   2.985E-07   2.743E-07
       79.286      79.372      84.657      85.125      85.956      86.148      87.533      88.194      88.748      89.217
      8.54317     8.55236     9.12182     9.17233     9.26189     9.28255     9.43181     9.50299     9.56269     9.61321
0   1.791E-07   1.372E-07   1.194E-07   8.230E-08   5.486E-08   4.115E-08
       90.155      94.331      94.608      98.700      99.808     100.000
      9.71424    10.16430    10.19415    10.63502    10.75442    10.77509
0          X/Q PERCENTILES
 (BASED ON THE UPPER ENVELOPE OF THE
 ORDERED X/Q-FREQUENCY VALUES, AND AS
 PLOTTED ON A LOG-NORMAL GRAPH.)
0 PERCENT OF TIME CHI/Q IS EQUALED OR EXCEEDED
        CHI/Q      WITH RESPECT TO     WHEN THE WIND BLOWS
 SEC/CUBIC METER  THE TOTAL TIME      INTO THIS SECTOR ONLY

                                                          HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 2)=   1.645
                                                          HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 3)=   3.015
                                                          HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 4)=   6.068
                                                          HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 5)=   8.540
                                                          HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 6)=   9.118
     1.443E-04              0.108              1.000
     8.392E-05              0.323              3.000
     6.391E-05              0.539              5.000
     4.303E-05              1.078             10.000
     3.358E-05              1.616             15.000
     2.408E-05              2.155             20.000
     1.827E-05              2.694             25.000
     1.421E-05              3.233             30.000
     1.114E-05              3.771             35.000
     8.970E-06              4.310             40.000
     7.374E-06              4.849             45.000
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     6.165E-06              5.388             50.000
     5.225E-06              5.926             55.000
     4.357E-06              6.465             60.000
     3.639E-06              7.004             65.000
     3.070E-06              7.543             70.000
     2.614E-06              8.081             75.000
     2.173E-06              8.620             80.000
0    6.657E-05              0.5                4.64
0ANNUAL AVERAGE =   5.65E-07
1USNRC COMPUTER CODE-PAVAN, VERSION 2.0          RUN DATE: Wed Apr 14 10:41:55 2004

/PLANT NAME: Palisades                           METEOROLOGICAL INSTRUMENTATION
 DATA PERIOD:  1999-2003                         WIND SENSORS HEIGHT: 10 Meters        DT
 TYPE OF RELEASE: Ground Level Release           DELTA-T HEIGHTS: from 10m to 60m
 SOURCE OF DATA: Data from onsite met tower
 COMMENTS: NONE
 PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145
0PARAMETER VALUES FOR THE CHI/Q CALCULATIONS FOR THE   N SECTOR.
 STABILITY WINDSPEED FREQUENCY DISTANCE TERRAIN HT EFF PLUME HT  SIGMA-Y SIGMA-Z MEANDER-SY  ** CHI/Q VALUES (SEC/CUBIC METER)
   CLASS   METER/SEC  PERCENT   METERS    METERS      METERS      METERS  METERS   METERS        MEANDER   BLDG WAKE        USED
         AT  10.0 METERS                                                                              CA=1006.SQ.METERS

    A         0.1       0.00     4820.        0.          0.       775.2  1000.0    775.2      4.116E-06   4.115E-06   4.115E-06
    A         1.5       1.02     4820.        0.          0.       775.2  1000.0    775.2      2.744E-07   2.743E-07   2.743E-07
    A         3.0       3.82     4820.        0.          0.       775.2  1000.0    775.2      1.372E-07   1.372E-07   1.372E-07
    A         5.0       3.68     4820.        0.          0.       775.2  1000.0    775.2      8.233E-08   8.230E-08   8.230E-08
    A         7.5       0.38     4820.        0.          0.       775.2  1000.0    775.2      5.489E-08   5.486E-08   5.486E-08

    B         0.1       0.00     4820.        0.          0.       583.0   610.6    583.0      8.964E-06   8.956E-06   8.956E-06
    B         1.5       0.12     4820.        0.          0.       583.0   610.6    583.0      5.976E-07   5.971E-07   5.971E-07
    B         3.0       1.02     4820.        0.          0.       583.0   610.6    583.0      2.988E-07   2.985E-07   2.985E-07
    B         5.0       0.76     4820.        0.          0.       583.0   610.6    583.0      1.793E-07   1.791E-07   1.791E-07

    C         0.1       0.01     4820.        0.          0.       442.7   256.1    442.7      2.815E-05   2.807E-05   2.807E-05
    C         1.5       0.38     4820.        0.          0.       442.7   256.1    442.7      1.877E-06   1.871E-06   1.871E-06
    C         3.0       1.52     4820.        0.          0.       442.7   256.1    442.7      9.384E-07   9.357E-07   9.357E-07
    C         5.0       1.28     4820.        0.          0.       442.7   256.1    442.7      5.630E-07   5.614E-07   5.614E-07
    C         7.5       0.12     4820.        0.          0.       442.7   256.1    442.7      3.753E-07   3.743E-07   3.743E-07

    D         0.1       0.11     4820.        0.          0.       311.7    87.2    373.3      9.804E-05   1.160E-04   9.804E-05
    D         1.5       2.54     4820.        0.          0.       311.7    87.2    373.3      6.536E-06   7.736E-06   6.536E-06
    D         3.0      13.11     4820.        0.          0.       311.7    87.2    345.6      3.529E-06   3.868E-06   3.529E-06
    D         5.0       8.41     4820.        0.          0.       311.7    87.2    319.3      2.292E-06   2.321E-06   2.292E-06
    D         7.5       1.28     4820.        0.          0.       311.7    87.2    311.7      1.565E-06   1.547E-06   1.547E-06

    E         0.1       0.14     4820.        0.          0.       221.7    55.4    309.2      1.867E-04   2.539E-04   1.867E-04
    E         1.5       4.58     4820.        0.          0.       221.7    55.4    309.2      1.245E-05   1.693E-05   1.245E-05
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    E         3.0      17.81     4820.        0.          0.       221.7    55.4    265.9      7.239E-06   8.463E-06   7.239E-06
    E         5.0       5.60     4820.        0.          0.       221.7    55.4    230.7      5.006E-06   5.078E-06   5.006E-06
    E         7.5       0.38     4820.        0.          0.       221.7    55.4    221.7      3.473E-06   3.385E-06   3.385E-06

    F         0.1       0.07     4820.        0.          0.       153.0    34.5    243.7      3.809E-04   5.719E-04   3.809E-04
    F         1.5       3.82     4820.        0.          0.       153.0    34.5    243.7      2.539E-05   3.813E-05   2.539E-05
    F         3.0       8.14     4820.        0.          0.       153.0    34.5    195.7      1.581E-05   1.906E-05   1.581E-05
    F         5.0       0.38     4820.        0.          0.       153.0    34.5    161.1      1.153E-05   1.144E-05   1.144E-05

    G         0.1       0.03     4820.        0.          0.       105.6    21.4    209.9      7.107E-04   1.238E-03   7.107E-04
    G         1.5       3.44     4820.        0.          0.       105.6    21.4    209.9      4.738E-05   8.251E-05   4.738E-05
    G         3.0      15.00     4820.        0.          0.       105.6    21.4    149.9      3.318E-05   4.126E-05   3.318E-05
    G         5.0       1.02     4820.        0.          0.       105.6    21.4    113.1      2.639E-05   2.475E-05   2.475E-05
1USNRC COMPUTER CODE-PAVAN, VERSION 2.0          RUN DATE: Wed Apr 14 10:41:55 2004

/PLANT NAME: Palisades                           METEOROLOGICAL INSTRUMENTATION
 DATA PERIOD:  1999-2003                         WIND SENSORS HEIGHT: 10 Meters        DT
 TYPE OF RELEASE: Ground Level Release           DELTA-T HEIGHTS: from 10m to 60m
 SOURCE OF DATA: Data from onsite met tower
 COMMENTS: NONE
 PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145
0LOW POPULATION ZONE CALCULATIONS:
0   N SECTOR     BOUNDARY DISTANCE = 4820.0 METERS
0LATERAL PLUME MEANDER/BUILDING WAKE CREDIT ALLOWED
 AS A FUNCTION OF DOWNWIND DISTANCE.
 MEANDER CREDIT IS FOR WINDSPEEDS LESS THAN 6 MPS.
 BUILDING WAKE CREDIT ALLOWED:   C=  0.5     A=  2011.     D=   58.5
 CORRECTION FACTORS USED IN THE ANNUAL AVERAGE CALCULATIONS.
0BELOW ARE PRINTED THE ORDERED VALUES OF CHI/Q AND THE FREQUENCY WITH WHICH THAT VALUE IS REACHED OR EXCEEDED.
 THE TOP NUMBER IS THE CHI/Q.  THE MIDDLE NUMBER IS THE FREQUENCY NORMALIZED TO THIS SECTOR.
 THE THIRD NUMBER IS THE FREQUENCY WITH RESPECT TO ALL TIME.
0   7.107E-04   3.809E-04   1.867E-04   9.804E-05   4.738E-05   3.318E-05   2.807E-05   2.539E-05   2.475E-05   1.581E-05
        0.032       0.106       0.248       0.363       3.808      18.811      18.817      22.641      23.663      31.807
      0.00250     0.00834     0.01953     0.02857     0.29952     1.47977     1.48020     1.78101     1.86138     2.50202
0   1.245E-05   1.144E-05   8.956E-06   7.239E-06   6.536E-06   5.006E-06   4.115E-06   3.529E-06   3.385E-06   2.292E-06
       36.389      36.769      36.770      54.576      57.116      62.720      62.724      75.830      76.210      84.617
      2.86252     2.89237     2.89245     4.29314     4.49291     4.93378     4.93409     5.96509     5.99494     6.65625
0   1.871E-06   1.547E-06   9.357E-07   5.971E-07   5.614E-07   3.743E-07   2.985E-07   2.743E-07   1.791E-07   1.372E-07
       84.996      86.281      87.798      87.915      89.200      89.316      90.338      91.360      92.119      95.943
      6.68610     6.78713     6.90654     6.91572     7.01675     7.02594     7.10631     7.18667     7.24637     7.54718
0   8.230E-08   5.486E-08
       99.621     100.000
      7.83650     7.86635
0          X/Q PERCENTILES
 (BASED ON THE UPPER ENVELOPE OF THE
 ORDERED X/Q-FREQUENCY VALUES, AND AS
 PLOTTED ON A LOG-NORMAL GRAPH.)
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0 PERCENT OF TIME CHI/Q IS EQUALED OR EXCEEDED
        CHI/Q      WITH RESPECT TO     WHEN THE WIND BLOWS
 SEC/CUBIC METER  THE TOTAL TIME      INTO THIS SECTOR ONLY

                                                          HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 2)=   1.478
                                                          HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 3)=   1.859
                                                          HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 4)=   4.290
                                                          HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 5)=   5.961
                                                          HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 6)=   6.652
     1.653E-04              0.079              1.000
     9.573E-05              0.236              3.000
     7.282E-05              0.393              5.000
     4.903E-05              0.787             10.000
     3.831E-05              1.180             15.000
     3.071E-05              1.573             20.000
     2.295E-05              1.967             25.000
     1.776E-05              2.360             30.000
     1.422E-05              2.753             35.000
     1.167E-05              3.147             40.000
     9.769E-06              3.540             45.000
     8.305E-06              3.933             50.000
     7.121E-06              4.326             55.000
     5.915E-06              4.720             60.000
     4.972E-06              5.113             65.000
     4.222E-06              5.506             70.000
     3.618E-06              5.900             75.000
     2.863E-06              6.293             80.000
0    6.372E-05              0.5                6.36
0ANNUAL AVERAGE =   5.15E-07
1USNRC COMPUTER CODE-PAVAN, VERSION 2.0          RUN DATE: Wed Apr 14 10:41:55 2004

/PLANT NAME: Palisades                           METEOROLOGICAL INSTRUMENTATION
 DATA PERIOD:  1999-2003                         WIND SENSORS HEIGHT: 10 Meters        DT
 TYPE OF RELEASE: Ground Level Release           DELTA-T HEIGHTS: from 10m to 60m
 SOURCE OF DATA: Data from onsite met tower
 COMMENTS: NONE
 PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145
0PARAMETER VALUES FOR THE CHI/Q CALCULATIONS FOR THE NNE SECTOR.
 STABILITY WINDSPEED FREQUENCY DISTANCE TERRAIN HT EFF PLUME HT  SIGMA-Y SIGMA-Z MEANDER-SY  ** CHI/Q VALUES (SEC/CUBIC METER)
   CLASS   METER/SEC  PERCENT   METERS    METERS      METERS      METERS  METERS   METERS        MEANDER   BLDG WAKE        USED
         AT  10.0 METERS                                                                                 CA=1006.SQ.METERS

    A         0.1       0.00     4820.        0.          0.       775.2  1000.0    775.2      4.116E-06   4.115E-06   4.115E-06
    A         1.5       0.88     4820.        0.          0.       775.2  1000.0    775.2      2.744E-07   2.743E-07   2.743E-07
    A         3.0       4.30     4820.        0.          0.       775.2  1000.0    775.2      1.372E-07   1.372E-07   1.372E-07
    A         5.0       1.81     4820.        0.          0.       775.2  1000.0    775.2      8.233E-08   8.230E-08   8.230E-08
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    B         0.1       0.00     4820.        0.          0.       583.0   610.6    583.0      8.964E-06   8.956E-06   8.956E-06
    B         1.5       0.21     4820.        0.          0.       583.0   610.6    583.0      5.976E-07   5.971E-07   5.971E-07
    B         3.0       1.35     4820.        0.          0.       583.0   610.6    583.0      2.988E-07   2.985E-07   2.985E-07
    B         5.0       0.67     4820.        0.          0.       583.0   610.6    583.0      1.793E-07   1.791E-07   1.791E-07

    C         3.0       1.60     4820.        0.          0.       442.7   256.1    442.7      9.384E-07   9.357E-07   9.357E-07
    C         5.0       0.67     4820.        0.          0.       442.7   256.1    442.7      5.630E-07   5.614E-07   5.614E-07
    C         7.5       0.21     4820.        0.          0.       442.7   256.1    442.7      3.753E-07   3.743E-07   3.743E-07

    D         0.1       0.17     4820.        0.          0.       311.7    87.2    373.3      9.804E-05   1.160E-04   9.804E-05
    D         1.5       3.83     4820.        0.          0.       311.7    87.2    373.3      6.536E-06   7.736E-06   6.536E-06
    D         3.0      14.91     4820.        0.          0.       311.7    87.2    345.6      3.529E-06   3.868E-06   3.529E-06
    D         5.0      14.24     4820.        0.          0.       311.7    87.2    319.3      2.292E-06   2.321E-06   2.292E-06
    D         7.5       1.35     4820.        0.          0.       311.7    87.2    311.7      1.565E-06   1.547E-06   1.547E-06

    E         0.1       0.15     4820.        0.          0.       221.7    55.4    309.2      1.867E-04   2.539E-04   1.867E-04
    E         1.5       4.76     4820.        0.          0.       221.7    55.4    309.2      1.245E-05   1.693E-05   1.245E-05
    E         3.0      18.74     4820.        0.          0.       221.7    55.4    265.9      7.239E-06   8.463E-06   7.239E-06
    E         5.0       9.27     4820.        0.          0.       221.7    55.4    230.7      5.006E-06   5.078E-06   5.006E-06
    E         7.5       0.47     4820.        0.          0.       221.7    55.4    221.7      3.473E-06   3.385E-06   3.385E-06

    F         0.1       0.04     4820.        0.          0.       153.0    34.5    243.7      3.809E-04   5.719E-04   3.809E-04
    F         1.5       2.28     4820.        0.          0.       153.0    34.5    243.7      2.539E-05   3.813E-05   2.539E-05
    F         3.0       6.99     4820.        0.          0.       153.0    34.5    195.7      1.581E-05   1.906E-05   1.581E-05
    F         5.0       0.67     4820.        0.          0.       153.0    34.5    161.1      1.153E-05   1.144E-05   1.144E-05

    G         0.1       0.02     4820.        0.          0.       105.6    21.4    209.9      7.107E-04   1.238E-03   7.107E-04
    G         1.5       2.28     4820.        0.          0.       105.6    21.4    209.9      4.738E-05   8.251E-05   4.738E-05
    G         3.0       7.92     4820.        0.          0.       105.6    21.4    149.9      3.318E-05   4.126E-05   3.318E-05
    G         5.0       0.21     4820.        0.          0.       105.6    21.4    113.1      2.639E-05   2.475E-05   2.475E-05
1USNRC COMPUTER CODE-PAVAN, VERSION 2.0          RUN DATE: Wed Apr 14 10:41:55 2004

/PLANT NAME: Palisades                           METEOROLOGICAL INSTRUMENTATION
 DATA PERIOD:  1999-2003                         WIND SENSORS HEIGHT: 10 Meters        DT
 TYPE OF RELEASE: Ground Level Release           DELTA-T HEIGHTS: from 10m to 60m
 SOURCE OF DATA: Data from onsite met tower
 COMMENTS: NONE
 PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145
0LOW POPULATION ZONE CALCULATIONS:
0 NNE SECTOR     BOUNDARY DISTANCE = 4820.0 METERS
0LATERAL PLUME MEANDER/BUILDING WAKE CREDIT ALLOWED
 AS A FUNCTION OF DOWNWIND DISTANCE.
 MEANDER CREDIT IS FOR WINDSPEEDS LESS THAN 6 MPS.
 BUILDING WAKE CREDIT ALLOWED:   C=  0.5     A=  2011.     D=   58.5
 CORRECTION FACTORS USED IN THE ANNUAL AVERAGE CALCULATIONS.
0BELOW ARE PRINTED THE ORDERED VALUES OF CHI/Q AND THE FREQUENCY WITH WHICH THAT VALUE IS REACHED OR EXCEEDED.
 THE TOP NUMBER IS THE CHI/Q.  THE MIDDLE NUMBER IS THE FREQUENCY NORMALIZED TO THIS SECTOR.
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 THE THIRD NUMBER IS THE FREQUENCY WITH RESPECT TO ALL TIME.
0   7.107E-04   3.809E-04   1.867E-04   9.804E-05   4.738E-05   3.318E-05   2.539E-05   2.475E-05   1.581E-05   1.245E-05
        0.021       0.065       0.213       0.386       2.664      10.585      12.863      13.070      20.060      24.823
      0.00093     0.00289     0.00945     0.01714     0.11817     0.46949     0.57052     0.57971     0.88970     1.10095
0   1.144E-05   8.956E-06   7.239E-06   6.536E-06   5.006E-06   4.115E-06   3.529E-06   3.385E-06   2.292E-06   1.547E-06
       25.496      25.497      44.239      48.070      57.337      57.340      72.250      72.716      86.954      88.300
      1.13080     1.13087     1.96210     2.13202     2.54304     2.54319     3.20450     3.22517     3.85663     3.91633
0   9.357E-07   5.971E-07   5.614E-07   3.743E-07   2.985E-07   2.743E-07   1.791E-07   1.372E-07   8.230E-08
       89.905      90.112      90.785      90.992      92.338      93.218      93.891      98.188     100.000
      3.98751     3.99670     4.02655     4.03573     4.09543     4.13447     4.16432     4.35490     4.43527
0          X/Q PERCENTILES
 (BASED ON THE UPPER ENVELOPE OF THE
 ORDERED X/Q-FREQUENCY VALUES, AND AS
 PLOTTED ON A LOG-NORMAL GRAPH.)
0 PERCENT OF TIME CHI/Q IS EQUALED OR EXCEEDED
        CHI/Q      WITH RESPECT TO     WHEN THE WIND BLOWS
 SEC/CUBIC METER  THE TOTAL TIME      INTO THIS SECTOR ONLY

                                                          HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 2)=   0.469
                                                          HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 3)=   1.960
                                                          HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 4)=   2.130
                                                          HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 5)=   3.202
                                                          HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 6)=   3.853
     1.246E-04              0.044              1.000
     6.960E-05              0.133              3.000
     5.211E-05              0.222              5.000
     3.438E-05              0.444             10.000
     2.346E-05              0.665             15.000
     1.743E-05              0.887             20.000
     1.375E-05              1.109             25.000
     1.126E-05              1.331             30.000
     9.477E-06              1.552             35.000
     8.137E-06              1.774             40.000
     7.089E-06              1.996             45.000
     6.169E-06              2.218             50.000
     5.356E-06              2.439             55.000
     4.698E-06              2.661             60.000
     4.158E-06              2.883             65.000
     3.708E-06              3.105             70.000
     3.239E-06              3.326             75.000
     2.788E-06              3.548             80.000
     2.419E-06              3.770             85.000
0    3.120E-05              0.5               11.27
0ANNUAL AVERAGE =   2.50E-07
1USNRC COMPUTER CODE-PAVAN, VERSION 2.0          RUN DATE: Wed Apr 14 10:41:55 2004

/PLANT NAME: Palisades                           METEOROLOGICAL INSTRUMENTATION
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DATA PERIOD: 1999-2003 WIND SENSORS HEIGHT: 10 Meters DT
TYPE OF RELEASE: Ground Level Release DELTA-T HEIGHTS: from 10m to 60m
SOURCE OF DATA: Data from onsite met tower
COMMENTS: NONE
PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145
0PARAMETER VALUES FOR THE CHI/Q CALCULATIONS FOR THE NE SECTOR.

STABILITY CLASS	WINDSPEED AT 10.0 METERS METER/SEC	FREQUENCY PERCENT	DISTANCE METERS	TERRAIN HT METERS	EFF PLUME HT METERS	SIGMA-Y METERS	SIGMA-Z METERS	MEANDER-SY METERS	** CHI/Q VALUES (SEC/CUBIC METER) MEANDER	BLDG WAKE CA=1006.SQ.METERS	USED
A	0.1	0.00	4820.	0.	0.	775.2	1000.0	775.2	4.116E-06	4.115E-06	4.115E-06
A	1.5	0.51	4820.	0.	0.	775.2	1000.0	775.2	2.744E-07	2.743E-07	2.743E-07
A	3.0	6.04	4820.	0.	0.	775.2	1000.0	775.2	1.372E-07	1.372E-07	1.372E-07
A	5.0	10.66	4820.	0.	0.	775.2	1000.0	775.2	8.233E-08	8.230E-08	8.230E-08
A	7.5	0.78	4820.	0.	0.	775.2	1000.0	775.2	5.489E-08	5.486E-08	5.486E-08
B	0.1	0.00	4820.	0.	0.	583.0	610.6	583.0	8.964E-06	8.956E-06	8.956E-06
B	1.5	0.12	4820.	0.	0.	583.0	610.6	583.0	5.976E-07	5.971E-07	5.971E-07
B	3.0	1.84	4820.	0.	0.	583.0	610.6	583.0	2.988E-07	2.985E-07	2.985E-07
B	5.0	2.90	4820.	0.	0.	583.0	610.6	583.0	1.793E-07	1.791E-07	1.791E-07
B	7.5	0.39	4820.	0.	0.	583.0	610.6	583.0	1.195E-07	1.194E-07	1.194E-07
C	0.1	0.00	4820.	0.	0.	442.7	256.1	442.7	2.815E-05	2.807E-05	2.807E-05
C	1.5	0.27	4820.	0.	0.	442.7	256.1	442.7	1.877E-06	1.871E-06	1.871E-06
C	3.0	2.63	4820.	0.	0.	442.7	256.1	442.7	9.384E-07	9.357E-07	9.357E-07
C	5.0	3.17	4820.	0.	0.	442.7	256.1	442.7	5.630E-07	5.614E-07	5.614E-07
C	7.5	0.78	4820.	0.	0.	442.7	256.1	442.7	3.753E-07	3.743E-07	3.743E-07
D	0.1	0.08	4820.	0.	0.	311.7	87.2	373.3	9.804E-05	1.160E-04	9.804E-05
D	1.5	1.84	4820.	0.	0.	311.7	87.2	373.3	6.536E-06	7.736E-06	6.536E-06
D	3.0	9.72	4820.	0.	0.	311.7	87.2	345.6	3.529E-06	3.868E-06	3.529E-06
D	5.0	24.33	4820.	0.	0.	311.7	87.2	319.3	2.292E-06	2.321E-06	2.292E-06
D	7.5	8.15	4820.	0.	0.	311.7	87.2	311.7	1.565E-06	1.547E-06	1.547E-06
D	10.0	0.12	4820.	0.	0.	311.7	87.2	311.7	1.174E-06	1.160E-06	1.160E-06
E	0.1	0.07	4820.	0.	0.	221.7	55.4	309.2	1.867E-04	2.539E-04	1.867E-04
E	1.5	2.23	4820.	0.	0.	221.7	55.4	309.2	1.245E-05	1.693E-05	1.245E-05
E	3.0	7.76	4820.	0.	0.	221.7	55.4	265.9	7.239E-06	8.463E-06	7.239E-06
E	5.0	8.70	4820.	0.	0.	221.7	55.4	230.7	5.006E-06	5.078E-06	5.006E-06
E	7.5	2.11	4820.	0.	0.	221.7	55.4	221.7	3.473E-06	3.385E-06	3.385E-06
E	10.0	0.12	4820.	0.	0.	221.7	55.4	221.7	2.605E-06	2.539E-06	2.539E-06
F	0.1	0.02	4820.	0.	0.	153.0	34.5	243.7	3.809E-04	5.719E-04	3.809E-04
F	1.5	1.06	4820.	0.	0.	153.0	34.5	243.7	2.539E-05	3.813E-05	2.539E-05
F	3.0	1.84	4820.	0.	0.	153.0	34.5	195.7	1.581E-05	1.906E-05	1.581E-05
F	5.0	0.27	4820.	0.	0.	153.0	34.5	161.1	1.153E-05	1.144E-05	1.144E-05

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    G         0.1       0.01     4820.        0.          0.       105.6    21.4    209.9      7.107E-04   1.238E-03   7.107E-04
    G         1.5       0.66     4820.        0.          0.       105.6    21.4    209.9      4.738E-05   8.251E-05   4.738E-05
    G         3.0       0.78     4820.        0.          0.       105.6    21.4    149.9      3.318E-05   4.126E-05   3.318E-05
1USNRC COMPUTER CODE-PAVAN, VERSION 2.0          RUN DATE: Wed Apr 14 10:41:55 2004

/PLANT NAME: Palisades                           METEOROLOGICAL INSTRUMENTATION
 DATA PERIOD:  1999-2003                         WIND SENSORS HEIGHT: 10 Meters        DT
 TYPE OF RELEASE: Ground Level Release           DELTA-T HEIGHTS: from 10m to 60m
 SOURCE OF DATA: Data from onsite met tower
 COMMENTS: NONE
 PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145
0LOW POPULATION ZONE CALCULATIONS:
0  NE SECTOR     BOUNDARY DISTANCE = 4820.0 METERS
0LATERAL PLUME MEANDER/BUILDING WAKE CREDIT ALLOWED
 AS A FUNCTION OF DOWNWIND DISTANCE.
 MEANDER CREDIT IS FOR WINDSPEEDS LESS THAN 6 MPS.
 BUILDING WAKE CREDIT ALLOWED:   C=  0.5     A=  2011.     D=   58.5
 CORRECTION FACTORS USED IN THE ANNUAL AVERAGE CALCULATIONS.
0BELOW ARE PRINTED THE ORDERED VALUES OF CHI/Q AND THE FREQUENCY WITH WHICH THAT VALUE IS REACHED OR EXCEEDED.
 THE TOP NUMBER IS THE CHI/Q.  THE MIDDLE NUMBER IS THE FREQUENCY NORMALIZED TO THIS SECTOR.
 THE THIRD NUMBER IS THE FREQUENCY WITH RESPECT TO ALL TIME.
0   7.107E-04   3.809E-04   1.867E-04   9.804E-05   4.738E-05   3.318E-05   2.807E-05   2.539E-05   1.581E-05   1.245E-05
        0.006       0.027       0.096       0.179       0.844       1.629       1.632       2.689       4.531       6.765
      0.00047     0.00203     0.00730     0.01364     0.06415     0.12385     0.12415     0.20452     0.34459     0.51451
0   1.144E-05   8.956E-06   7.239E-06   6.536E-06   5.006E-06   4.115E-06   3.529E-06   3.385E-06   2.539E-06   2.292E-06
        7.037       7.038      14.797      16.639      25.334      25.336      35.058      37.171      37.292      61.626
      0.53518     0.53525     1.12538     1.26544     1.92675     1.92690     2.66628     2.82702     2.83620     4.68695
0   1.871E-06   1.547E-06   1.160E-06   9.357E-07   5.971E-07   5.614E-07   3.743E-07   2.985E-07   2.743E-07   1.791E-07
       61.898      70.050      70.171      72.797      72.918      76.088      76.873      78.715      79.228      82.127
      4.70762     5.32759     5.33678     5.53655     5.54573     5.78683     5.84654     5.98661     6.02564     6.24608
0   1.372E-07   1.194E-07   8.230E-08   5.486E-08
       88.165      88.557      99.215     100.000
      6.70532     6.73517     7.54573     7.60544
0          X/Q PERCENTILES
 (BASED ON THE UPPER ENVELOPE OF THE
 ORDERED X/Q-FREQUENCY VALUES, AND AS
 PLOTTED ON A LOG-NORMAL GRAPH.)
0 PERCENT OF TIME CHI/Q IS EQUALED OR EXCEEDED
        CHI/Q      WITH RESPECT TO     WHEN THE WIND BLOWS
 SEC/CUBIC METER  THE TOTAL TIME      INTO THIS SECTOR ONLY

                                                          HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 2)=   0.002
                                                          HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 3)=   0.204
                                                          HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 4)=   1.925
                                                          HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 5)=   4.683
                                                          HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 6)=   5.324
     4.902E-05             0.076             1.000
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     2.367E-05              0.228              3.000
     1.687E-05              0.380              5.000
     1.034E-05              0.761             10.000
     7.619E-06              1.141             15.000
     6.074E-06              1.521             20.000
     5.062E-06              1.901             25.000
     4.353E-06              2.282             30.000
     3.820E-06              2.662             35.000
     3.402E-06              3.042             40.000
     3.064E-06              3.422             45.000
     2.785E-06              3.803             50.000
     2.551E-06              4.183             55.000
     2.351E-06              4.563             60.000
     1.949E-06              4.944             65.000
     1.551E-06              5.324             70.000
0    1.397E-05              0.5                6.57
0ANNUAL AVERAGE =   2.15E-07
1USNRC COMPUTER CODE-PAVAN, VERSION 2.0          RUN DATE: Wed Apr 14 10:41:55 2004

/PLANT NAME: Palisades                           METEOROLOGICAL INSTRUMENTATION
 DATA PERIOD:  1999-2003                         WIND SENSORS HEIGHT: 10 Meters       DT
 TYPE OF RELEASE: Ground Level Release           DELTA-T HEIGHTS: from 10m to 60m
 SOURCE OF DATA: Data from onsite met tower
 COMMENTS: NONE
 PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145
0PARAMETER VALUES FOR THE CHI/Q CALCULATIONS FOR THE ENE SECTOR.
 STABILITY WINDSPEED FREQUENCY DISTANCE TERRAIN HT EFF PLUME HT  SIGMA-Y SIGMA-Z MEANDER-SY  ** CHI/Q VALUES (SEC/CUBIC METER)
   CLASS   METER/SEC  PERCENT   METERS    METERS      METERS      METERS  METERS   METERS        MEANDER   BLDG WAKE        USED
         AT  10.0 METERS                                                                              CA=1006.SQ.METERS

    A         0.1       0.00     4820.        0.          0.       775.2  1000.0    775.2      4.116E-06   4.115E-06   4.115E-06
    A         1.5       1.13     4820.        0.          0.       775.2  1000.0    775.2      2.744E-07   2.743E-07   2.743E-07
    A         3.0      15.04     4820.        0.          0.       775.2  1000.0    775.2      1.372E-07   1.372E-07   1.372E-07
    A         5.0      10.61     4820.        0.          0.       775.2  1000.0    775.2      8.233E-08   8.230E-08   8.230E-08
    A         7.5       0.62     4820.        0.          0.       775.2  1000.0    775.2      5.489E-08   5.486E-08   5.486E-08

    B         0.1       0.01     4820.        0.          0.       583.0   610.6    583.0      8.964E-06   8.956E-06   8.956E-06
    B         1.5       0.80     4820.        0.          0.       583.0   610.6    583.0      5.976E-07   5.971E-07   5.971E-07
    B         3.0       1.74     4820.        0.          0.       583.0   610.6    583.0      2.988E-07   2.985E-07   2.985E-07
    B         5.0       2.54     4820.        0.          0.       583.0   610.6    583.0      1.793E-07   1.791E-07   1.791E-07
    B         7.5       0.15     4820.        0.          0.       583.0   610.6    583.0      1.195E-07   1.194E-07   1.194E-07

    C         0.1       0.01     4820.        0.          0.       442.7   256.1    442.7      2.815E-05   2.807E-05   2.807E-05
    C         1.5       0.47     4820.        0.          0.       442.7   256.1    442.7      1.877E-06   1.871E-06   1.871E-06
    C         3.0       1.42     4820.        0.          0.       442.7   256.1    442.7      9.384E-07   9.357E-07   9.357E-07
    C         5.0       2.22     4820.        0.          0.       442.7   256.1    442.7      5.630E-07   5.614E-07   5.614E-07
    C         7.5       0.47     4820.        0.          0.       442.7   256.1    442.7      3.753E-07   3.743E-07   3.743E-07
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    D         0.1       0.14     4820.        0.          0.       311.7    87.2    373.3      9.804E-05   1.160E-04   9.804E-05
    D         1.5       3.16     4820.        0.          0.       311.7    87.2    373.3      6.536E-06   7.736E-06   6.536E-06
    D         3.0       7.45     4820.        0.          0.       311.7    87.2    345.6      3.529E-06   3.868E-06   3.529E-06
    D         5.0      16.46     4820.        0.          0.       311.7    87.2    319.3      2.292E-06   2.321E-06   2.292E-06
    D         7.5       9.81     4820.        0.          0.       311.7    87.2    311.7      1.565E-06   1.547E-06   1.547E-06
    D        10.0       1.13     4820.        0.          0.       311.7    87.2    311.7      1.174E-06   1.160E-06   1.160E-06

    E         0.1       0.06     4820.        0.          0.       221.7    55.4    309.2      1.867E-04   2.539E-04   1.867E-04
    E         1.5       2.07     4820.        0.          0.       221.7    55.4    309.2      1.245E-05   1.693E-05   1.245E-05
    E         3.0       8.07     4820.        0.          0.       221.7    55.4    265.9      7.239E-06   8.463E-06   7.239E-06
    E         5.0       7.59     4820.        0.          0.       221.7    55.4    230.7      5.006E-06   5.078E-06   5.006E-06
    E         7.5       2.69     4820.        0.          0.       221.7    55.4    221.7      3.473E-06   3.385E-06   3.385E-06
    E        10.0       0.15     4820.        0.          0.       221.7    55.4    221.7      2.605E-06   2.539E-06   2.539E-06

    F         0.1       0.02     4820.        0.          0.       153.0    34.5    243.7      3.809E-04   5.719E-04   3.809E-04
    F         1.5       1.27     4820.        0.          0.       153.0    34.5    243.7      2.539E-05   3.813E-05   2.539E-05
    F         3.0       1.74     4820.        0.          0.       153.0    34.5    195.7      1.581E-05   1.906E-05   1.581E-05
    F         5.0       0.33     4820.        0.          0.       153.0    34.5    161.1      1.153E-05   1.144E-05   1.144E-05
    F         7.5       0.15     4820.        0.          0.       153.0    34.5    153.0      8.088E-06   7.625E-06   7.625E-06

    G         0.1       0.00     4820.        0.          0.       105.6    21.4    209.9      7.107E-04   1.238E-03   7.107E-04
    G         1.5       0.33     4820.        0.          0.       105.6    21.4    209.9      4.738E-05   8.251E-05   4.738E-05
    G         3.0       0.15     4820.        0.          0.       105.6    21.4    149.9      3.318E-05   4.126E-05   3.318E-05
1USNRC COMPUTER CODE-PAVAN, VERSION 2.0          RUN DATE: Wed Apr 14 10:41:55 2004

/PLANT NAME: Palisades                           METEOROLOGICAL INSTRUMENTATION
 DATA PERIOD:  1999-2003                         WIND SENSORS HEIGHT: 10 Meters        DT
 TYPE OF RELEASE: Ground Level Release           DELTA-T HEIGHTS: from 10m to 60m
 SOURCE OF DATA: Data from onsite met tower
 COMMENTS: NONE
 PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145
0LOW POPULATION ZONE CALCULATIONS:
0 ENE SECTOR     BOUNDARY DISTANCE = 4820.0 METERS
0LATERAL PLUME MEANDER/BUILDING WAKE CREDIT ALLOWED
 AS A FUNCTION OF DOWNWIND DISTANCE.
 MEANDER CREDIT IS FOR WINDSPEEDS LESS THAN 6 MPS.
 BUILDING WAKE CREDIT ALLOWED:   C=  0.5     A=  2011.     D=   58.5
 CORRECTION FACTORS USED IN THE ANNUAL AVERAGE CALCULATIONS.
0BELOW ARE PRINTED THE ORDERED VALUES OF CHI/Q AND THE FREQUENCY WITH WHICH THAT VALUE IS REACHED OR EXCEEDED.
 THE TOP NUMBER IS THE CHI/Q.  THE MIDDLE NUMBER IS THE FREQUENCY NORMALIZED TO THIS SECTOR.
 THE THIRD NUMBER IS THE FREQUENCY WITH RESPECT TO ALL TIME.
0   7.107E-04   3.809E-04   1.867E-04   9.804E-05   4.738E-05   3.318E-05   2.807E-05   2.539E-05   1.581E-05   1.245E-05
        0.003       0.028       0.092       0.235       0.562       0.707       0.714       1.986       3.730       5.802
      0.00019     0.00175     0.00582     0.01485     0.03551     0.04470     0.04513     0.12550     0.23572     0.36660
0   1.144E-05   8.956E-06   7.625E-06   7.239E-06   6.536E-06   5.006E-06   4.115E-06   3.529E-06   3.385E-06   2.539E-06
        6.129       6.135       6.280      14.347      17.509      25.103      25.108      32.557      35.246      35.391
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      0.38727     0.38767     0.39686     0.90662     1.10639     1.58629     1.58657     2.05729     2.22721     2.23640
0   2.292E-06   1.871E-06   1.547E-06   1.160E-06   9.357E-07   5.971E-07   5.614E-07   3.743E-07   2.985E-07   2.743E-07
       51.852      52.325      62.136      63.262      64.680      65.479      67.696      68.168      69.912      71.039
      3.27658     3.30643     3.92641     3.99759     4.08714     4.13766     4.27773     4.30758     4.41780     4.48898
0   1.791E-07   1.372E-07   1.194E-07   8.230E-08   5.486E-08
       73.582      88.626      88.772      99.382     100.000
      4.64971     5.60035     5.60953     6.28002     6.31906
0          X/Q PERCENTILES
 (BASED ON THE UPPER ENVELOPE OF THE
 ORDERED X/Q-FREQUENCY VALUES, AND AS
 PLOTTED ON A LOG-NORMAL GRAPH.)
0 PERCENT OF TIME CHI/Q IS EQUALED OR EXCEEDED
        CHI/Q      WITH RESPECT TO     WHEN THE WIND BLOWS
 SEC/CUBIC METER  THE TOTAL TIME      INTO THIS SECTOR ONLY

                                                        HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 2)=   0.002
                                                        HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 3)=   0.366
                                                        HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 4)=   1.105
                                                        HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 5)=   1.585
                                                        HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 6)=   3.274
                                                        HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 7)=   3.923
     4.452E-05              0.063              1.000
     2.056E-05              0.190              3.000
     1.398E-05              0.316              5.000
     9.155E-06              0.632             10.000
     7.190E-06              0.948             15.000
     5.932E-06              1.264             20.000
     5.022E-06              1.580             25.000
     4.166E-06              1.896             30.000
     3.539E-06              2.212             35.000
     3.063E-06              2.528             40.000
     2.690E-06              2.844             45.000
     2.389E-06              3.160             50.000
     2.020E-06              3.475             55.000
     1.671E-06              3.791             60.000
0    1.047E-05              0.5                7.91
0ANNUAL AVERAGE =   1.73E-07
1USNRC COMPUTER CODE-PAVAN, VERSION 2.0          RUN DATE: Wed Apr 14 10:41:55 2004

/PLANT NAME: Palisades                           METEOROLOGICAL INSTRUMENTATION
 DATA PERIOD:  1999-2003                         WIND SENSORS HEIGHT: 10 Meters        DT
 TYPE OF RELEASE: Ground Level Release           DELTA-T HEIGHTS: from 10m to 60m
 SOURCE OF DATA: Data from onsite met tower
 COMMENTS: NONE
 PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145
0PARAMETER VALUES FOR THE CHI/Q CALCULATIONS FOR THE   E SECTOR.
 STABILITY WINDSPEED FREQUENCY DISTANCE TERRAIN HT EFF PLUME HT  SIGMA-Y SIGMA-Z MEANDER-SY  ** CHI/Q VALUES (SEC/CUBIC METER)
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CLASS	METER/SEC AT 10.0 METERS	PERCENT	METERS	METERS	METERS	METERS	METERS	METERS	MEANDER	BLDG WAKE CA=1006.SQ.METERS	USED
A	0.1	0.01	4820.	0.	0.	775.2	1000.0	775.2	4.116E-06	4.115E-06	4.115E-06
A	1.5	2.39	4820.	0.	0.	775.2	1000.0	775.2	2.744E-07	2.743E-07	2.743E-07
A	3.0	13.79	4820.	0.	0.	775.2	1000.0	775.2	1.372E-07	1.372E-07	1.372E-07
A	5.0	4.82	4820.	0.	0.	775.2	1000.0	775.2	8.233E-08	8.230E-08	8.230E-08
A	7.5	0.48	4820.	0.	0.	775.2	1000.0	775.2	5.489E-08	5.486E-08	5.486E-08
B	0.1	0.00	4820.	0.	0.	583.0	610.6	583.0	8.964E-06	8.956E-06	8.956E-06
B	1.5	0.62	4820.	0.	0.	583.0	610.6	583.0	5.976E-07	5.971E-07	5.971E-07
B	3.0	1.29	4820.	0.	0.	583.0	610.6	583.0	2.988E-07	2.985E-07	2.985E-07
B	5.0	0.81	4820.	0.	0.	583.0	610.6	583.0	1.793E-07	1.791E-07	1.791E-07
B	7.5	0.33	4820.	0.	0.	583.0	610.6	583.0	1.195E-07	1.194E-07	1.194E-07
C	0.1	0.01	4820.	0.	0.	442.7	256.1	442.7	2.815E-05	2.807E-05	2.807E-05
C	1.5	0.48	4820.	0.	0.	442.7	256.1	442.7	1.877E-06	1.871E-06	1.871E-06
C	3.0	1.43	4820.	0.	0.	442.7	256.1	442.7	9.384E-07	9.357E-07	9.357E-07
C	5.0	1.29	4820.	0.	0.	442.7	256.1	442.7	5.630E-07	5.614E-07	5.614E-07
C	7.5	0.33	4820.	0.	0.	442.7	256.1	442.7	3.753E-07	3.743E-07	3.743E-07
D	0.1	0.09	4820.	0.	0.	311.7	87.2	373.3	9.804E-05	1.160E-04	9.804E-05
D	1.5	1.91	4820.	0.	0.	311.7	87.2	373.3	6.536E-06	7.736E-06	6.536E-06
D	3.0	7.35	4820.	0.	0.	311.7	87.2	345.6	3.529E-06	3.868E-06	3.529E-06
D	5.0	20.18	4820.	0.	0.	311.7	87.2	319.3	2.292E-06	2.321E-06	2.292E-06
D	7.5	16.84	4820.	0.	0.	311.7	87.2	311.7	1.565E-06	1.547E-06	1.547E-06
D	10.0	3.68	4820.	0.	0.	311.7	87.2	311.7	1.174E-06	1.160E-06	1.160E-06
D	15.0	0.48	4820.	0.	0.	311.7	87.2	311.7	7.827E-07	7.736E-07	7.736E-07
E	0.1	0.07	4820.	0.	0.	221.7	55.4	309.2	1.867E-04	2.539E-04	1.867E-04
E	1.5	2.10	4820.	0.	0.	221.7	55.4	309.2	1.245E-05	1.693E-05	1.245E-05
E	3.0	5.92	4820.	0.	0.	221.7	55.4	265.9	7.239E-06	8.463E-06	7.239E-06
E	5.0	6.87	4820.	0.	0.	221.7	55.4	230.7	5.006E-06	5.078E-06	5.006E-06
E	7.5	2.10	4820.	0.	0.	221.7	55.4	221.7	3.473E-06	3.385E-06	3.385E-06
E	10.0	0.33	4820.	0.	0.	221.7	55.4	221.7	2.605E-06	2.539E-06	2.539E-06
F	0.1	0.02	4820.	0.	0.	153.0	34.5	243.7	3.809E-04	5.719E-04	3.809E-04
F	1.5	0.96	4820.	0.	0.	153.0	34.5	243.7	2.539E-05	3.813E-05	2.539E-05
F	3.0	0.96	4820.	0.	0.	153.0	34.5	195.7	1.581E-05	1.906E-05	1.581E-05
F	5.0	0.96	4820.	0.	0.	153.0	34.5	161.1	1.153E-05	1.144E-05	1.144E-05
F	7.5	0.33	4820.	0.	0.	153.0	34.5	153.0	8.088E-06	7.625E-06	7.625E-06
G	0.1	0.00	4820.	0.	0.	105.6	21.4	209.9	7.107E-04	1.238E-03	7.107E-04
G	1.5	0.33	4820.	0.	0.	105.6	21.4	209.9	4.738E-05	8.251E-05	4.738E-05
G	3.0	0.48	4820.	0.	0.	105.6	21.4	149.9	3.318E-05	4.126E-05	3.318E-05

1USNRC COMPUTER CODE-PAVAN, VERSION 2.0 RUN DATE: Wed Apr 14 10:41:55 2004

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/PLANT NAME: Palisades                          METEOROLOGICAL INSTRUMENTATION
 DATA PERIOD:  1999-2003                        WIND SENSORS HEIGHT: 10 Meters        DT
 TYPE OF RELEASE: Ground Level Release          DELTA-T HEIGHTS: from 10m to 60m
 SOURCE OF DATA: Data from onsite met tower
 COMMENTS: NONE
 PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145
0LOW POPULATION ZONE CALCULATIONS:
0   E SECTOR     BOUNDARY DISTANCE = 4820.0 METERS
0LATERAL PLUME MEANDER/BUILDING WAKE CREDIT ALLOWED
 AS A FUNCTION OF DOWNWIND DISTANCE.
 MEANDER CREDIT IS FOR WINDSPEEDS LESS THAN 6 MPS.
 BUILDING WAKE CREDIT ALLOWED:   C=  0.5     A=  2011.     D=   58.5
 CORRECTION FACTORS USED IN THE ANNUAL AVERAGE CALCULATIONS.
0BELOW ARE PRINTED THE ORDERED VALUES OF CHI/Q AND THE FREQUENCY WITH WHICH THAT VALUE IS REACHED OR EXCEEDED.
 THE TOP NUMBER IS THE CHI/Q.  THE MIDDLE NUMBER IS THE FREQUENCY NORMALIZED TO THIS SECTOR.
 THE THIRD NUMBER IS THE FREQUENCY WITH RESPECT TO ALL TIME.
0   7.107E-04   3.809E-04   1.867E-04   9.804E-05   4.738E-05   3.318E-05   2.807E-05   2.539E-05   1.581E-05   1.245E-05
        0.003       0.022       0.087       0.173       0.504       0.982       0.989       1.945       2.900       4.996
      0.00019     0.00135     0.00541     0.01081     0.03148     0.06133     0.06176     0.12146     0.18117     0.31205
0   1.144E-05   8.956E-06   7.625E-06   7.239E-06   6.536E-06   5.006E-06   4.115E-06   3.529E-06   3.385E-06   2.539E-06
        5.951       5.956       6.287      12.206      14.117      20.992      21.001      28.353      30.448      30.779
      0.37175     0.37206     0.39273     0.76242     0.88182     1.31121     1.31179     1.77103     1.90192     1.92258
0   2.292E-06   1.871E-06   1.547E-06   1.160E-06   9.357E-07   7.736E-07   5.971E-07   5.614E-07   3.743E-07   2.985E-07
       50.961      51.439      68.275      71.951      73.385      73.863      74.488      75.775      76.105      77.392
      3.18320     3.21305     4.26472     4.49434     4.58389     4.61374     4.65278     4.73314     4.75381     4.83418
0   2.743E-07   1.791E-07   1.372E-07   1.194E-07   8.230E-08   5.486E-08
       79.782      80.590      94.376      94.706      99.522     100.000
      4.98343     5.03395     5.89503     5.91569     6.21650     6.24635
0          X/Q PERCENTILES
 (BASED ON THE UPPER ENVELOPE OF THE
 ORDERED X/Q-FREQUENCY VALUES, AND AS
 PLOTTED ON A LOG-NORMAL GRAPH.)
0 PERCENT OF TIME CHI/Q IS EQUALED OR EXCEEDED
        CHI/Q      WITH RESPECT TO     WHEN THE WIND BLOWS
 SEC/CUBIC METER  THE TOTAL TIME      INTO THIS SECTOR ONLY

                                                          HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 2)=   0.001
                                                          HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 3)=   0.005
                                                          HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 4)=   0.371
                                                          HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 5)=   1.310
                                                          HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 6)=   3.180
                                                          HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 7)=   4.261
     4.145E-05              0.062              1.000
     1.922E-05              0.187              3.000
     1.309E-05              0.312              5.000
     8.260E-06              0.625             10.000
     6.318E-06              0.937             15.000
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     5.180E-06              1.249             20.000
     4.327E-06              1.562             25.000
     3.702E-06              1.874             30.000
     3.233E-06              2.186             35.000
     2.868E-06              2.499             40.000
     2.575E-06              2.811             45.000
     2.334E-06              3.123             50.000
     2.073E-06              3.435             55.000
     1.845E-06              3.748             60.000
     1.655E-06              4.060             65.000
0    9.519E-06              0.5                8.00
0ANNUAL AVERAGE =   1.57E-07
1USNRC COMPUTER CODE-PAVAN, VERSION 2.0          RUN DATE: Wed Apr 14 10:41:55 2004

/PLANT NAME: Palisades                           METEOROLOGICAL INSTRUMENTATION
 DATA PERIOD:  1999-2003                         WIND SENSORS HEIGHT: 10 Meters       DT
 TYPE OF RELEASE: Ground Level Release           DELTA-T HEIGHTS: from 10m to 60m
 SOURCE OF DATA: Data from onsite met tower
 COMMENTS: NONE
 PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145
0PARAMETER VALUES FOR THE CHI/Q CALCULATIONS FOR THE ESE SECTOR.
 STABILITY WINDSPEED FREQUENCY DISTANCE TERRAIN HT EFF PLUME HT  SIGMA-Y SIGMA-Z MEANDER-SY  ** CHI/Q VALUES (SEC/CUBIC METER)
   CLASS   METER/SEC  PERCENT   METERS    METERS      METERS      METERS  METERS   METERS        MEANDER   BLDG WAKE        USED
         AT  10.0 METERS                                                                                  CA=1006.SQ.METERS

    A         0.1       0.01     4820.        0.          0.       775.2  1000.0    775.2      4.116E-06   4.115E-06   4.115E-06
    A         1.5       2.74     4820.        0.          0.       775.2  1000.0    775.2      2.744E-07   2.743E-07   2.743E-07
    A         3.0      16.55     4820.        0.          0.       775.2  1000.0    775.2      1.372E-07   1.372E-07   1.372E-07
    A         5.0       3.90     4820.        0.          0.       775.2  1000.0    775.2      8.233E-08   8.230E-08   8.230E-08
    A         7.5       0.56     4820.        0.          0.       775.2  1000.0    775.2      5.489E-08   5.486E-08   5.486E-08

    B         0.1       0.01     4820.        0.          0.       583.0   610.6    583.0      8.964E-06   8.956E-06   8.956E-06
    B         1.5       0.73     4820.        0.          0.       583.0   610.6    583.0      5.976E-07   5.971E-07   5.971E-07
    B         3.0       1.02     4820.        0.          0.       583.0   610.6    583.0      2.988E-07   2.985E-07   2.985E-07
    B         5.0       1.29     4820.        0.          0.       583.0   610.6    583.0      1.793E-07   1.791E-07   1.791E-07
    B         7.5       0.30     4820.        0.          0.       583.0   610.6    583.0      1.195E-07   1.194E-07   1.194E-07

    C         0.1       0.01     4820.        0.          0.       442.7   256.1    442.7      2.815E-05   2.807E-05   2.807E-05
    C         1.5       0.43     4820.        0.          0.       442.7   256.1    442.7      1.877E-06   1.871E-06   1.871E-06
    C         3.0       1.16     4820.        0.          0.       442.7   256.1    442.7      9.384E-07   9.357E-07   9.357E-07
    C         5.0       2.01     4820.        0.          0.       442.7   256.1    442.7      5.630E-07   5.614E-07   5.614E-07
    C         7.5       0.73     4820.        0.          0.       442.7   256.1    442.7      3.753E-07   3.743E-07   3.743E-07

    D         0.1       0.09     4820.        0.          0.       311.7    87.2    373.3      9.804E-05   1.160E-04   9.804E-05
    D         1.5       2.01     4820.        0.          0.       311.7    87.2    373.3      6.536E-06   7.736E-06   6.536E-06
    D         3.0       7.50     4820.        0.          0.       311.7    87.2    345.6      3.529E-06   3.868E-06   3.529E-06
    D         5.0      25.33     4820.        0.          0.       311.7    87.2    319.3      2.292E-06   2.321E-06   2.292E-06
```

D	7.5	15.69	4820.	0.	0.	311.7	87.2	311.7	1.565E-06	1.547E-06	1.547E-06
D	10.0	1.29	4820.	0.	0.	311.7	87.2	311.7	1.174E-06	1.160E-06	1.160E-06
D	15.0	0.13	4820.	0.	0.	311.7	87.2	311.7	7.827E-07	7.736E-07	7.736E-07
E	0.1	0.06	4820.	0.	0.	221.7	55.4	309.2	1.867E-04	2.539E-04	1.867E-04
E	1.5	1.88	4820.	0.	0.	221.7	55.4	309.2	1.245E-05	1.693E-05	1.245E-05
E	3.0	5.48	4820.	0.	0.	221.7	55.4	265.9	7.239E-06	8.463E-06	7.239E-06
E	5.0	4.89	4820.	0.	0.	221.7	55.4	230.7	5.006E-06	5.078E-06	5.006E-06
E	7.5	1.29	4820.	0.	0.	221.7	55.4	221.7	3.473E-06	3.385E-06	3.385E-06
F	0.1	0.01	4820.	0.	0.	153.0	34.5	243.7	3.809E-04	5.719E-04	3.809E-04
F	1.5	0.73	4820.	0.	0.	153.0	34.5	243.7	2.539E-05	3.813E-05	2.539E-05
F	3.0	1.02	4820.	0.	0.	153.0	34.5	195.7	1.581E-05	1.906E-05	1.581E-05
F	5.0	0.30	4820.	0.	0.	153.0	34.5	161.1	1.153E-05	1.144E-05	1.144E-05
G	0.1	0.01	4820.	0.	0.	105.6	21.4	209.9	7.107E-04	1.238E-03	7.107E-04
G	1.5	0.56	4820.	0.	0.	105.6	21.4	209.9	4.738E-05	8.251E-05	4.738E-05
G	3.0	0.30	4820.	0.	0.	105.6	21.4	149.9	3.318E-05	4.126E-05	3.318E-05

1USNRC COMPUTER CODE-PAVAN, VERSION 2.0 RUN DATE: Wed Apr 14 10:41:55 2004

/PLANT NAME: Palisades METEOROLOGICAL INSTRUMENTATION
DATA PERIOD: 1999-2003 WIND SENSORS HEIGHT: 10 Meters DT
TYPE OF RELEASE: Ground Level Release DELTA-T HEIGHTS: from 10m to 60m
SOURCE OF DATA: Data from onsite met tower
COMMENTS: NONE
PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145
0LOW POPULATION ZONE CALCULATIONS:
0 ESE SECTOR BOUNDARY DISTANCE = 4820.0 METERS
0LATERAL PLUME MEANDER/BUILDING WAKE CREDIT ALLOWED
AS A FUNCTION OF DOWNWIND DISTANCE.
MEANDER CREDIT IS FOR WINDSPEEDS LESS THAN 6 MPS.
BUILDING WAKE CREDIT ALLOWED: C= 0.5 A= 2011. D= 58.5
CORRECTION FACTORS USED IN THE ANNUAL AVERAGE CALCULATIONS.
0BELOW ARE PRINTED THE ORDERED VALUES OF CHI/Q AND THE FREQUENCY WITH WHICH THAT VALUE IS REACHED OR EXCEEDED.
THE TOP NUMBER IS THE CHI/Q. THE MIDDLE NUMBER IS THE FREQUENCY NORMALIZED TO THIS SECTOR.
THE THIRD NUMBER IS THE FREQUENCY WITH RESPECT TO ALL TIME.

0	7.107E-04	3.809E-04	1.867E-04	9.804E-05	4.738E-05	3.318E-05	2.807E-05	2.539E-05	1.581E-05	1.245E-05
	0.005	0.019	0.078	0.169	0.730	1.028	1.034	1.760	2.784	4.667
	0.00036	0.00134	0.00541	0.01174	0.05077	0.07144	0.07187	0.12239	0.19357	0.32446
0	1.144E-05	8.956E-06	7.239E-06	6.536E-06	5.006E-06	4.115E-06	3.529E-06	3.385E-06	2.292E-06	1.871E-06
	4.964	4.970	10.452	12.467	17.355	17.366	24.863	26.151	51.483	51.912
	0.34512	0.34553	0.72670	0.86677	1.20661	1.20734	1.72858	1.81813	3.57933	3.60918
0	1.547E-06	1.160E-06	9.357E-07	7.736E-07	5.971E-07	5.614E-07	3.743E-07	2.985E-07	2.743E-07	1.791E-07
	67.600	68.888	70.044	70.176	70.903	72.918	73.644	74.668	77.409	78.697
	4.69988	4.78943	4.86980	4.87898	4.92950	5.06957	5.12008	5.19127	5.38185	5.47141
0	1.372E-07	1.194E-07	8.230E-08	5.486E-08						
	95.244	95.541	99.439	100.000						

```
      6.62181     6.64247     6.91343     6.95246
0          X/Q PERCENTILES
 (BASED ON THE UPPER ENVELOPE OF THE
 ORDERED X/Q-FREQUENCY VALUES, AND AS
 PLOTTED ON A LOG-NORMAL GRAPH.)
0 PERCENT OF TIME CHI/Q IS EQUALED OR EXCEEDED
        CHI/Q      WITH RESPECT TO     WHEN THE WIND BLOWS
 SEC/CUBIC METER  THE TOTAL TIME      INTO THIS SECTOR ONLY

                                                          HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 2)=   0.001
                                                          HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 3)=   0.005
                                                          HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 4)=   0.051
                                                          HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 5)=   0.866
                                                          HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 6)=   3.576
                                                          HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 7)=   4.696
     3.896E-05              0.070              1.000
     1.887E-05              0.209              3.000
     1.314E-05              0.348              5.000
     7.788E-06              0.695             10.000
     5.768E-06              1.043             15.000
     4.720E-06              1.390             20.000
     4.017E-06              1.738             25.000
     3.508E-06              2.086             30.000
     3.119E-06              2.433             35.000
     2.810E-06              2.781             40.000
     2.558E-06              3.129             45.000
     2.348E-06              3.476             50.000
     2.087E-06              3.824             55.000
     1.842E-06              4.171             60.000
     1.639E-06              4.519             65.000
0    1.004E-05              0.5                7.19
0ANNUAL AVERAGE =   1.69E-07
1USNRC COMPUTER CODE-PAVAN, VERSION 2.0          RUN DATE: Wed Apr 14 10:41:55 2004

/PLANT NAME: Palisades                           METEOROLOGICAL INSTRUMENTATION
 DATA PERIOD:  1999-2003                         WIND SENSORS HEIGHT: 10 Meters        DT
 TYPE OF RELEASE: Ground Level Release           DELTA-T HEIGHTS: from 10m to 60m
 SOURCE OF DATA: Data from onsite met tower
 COMMENTS: NONE
 PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145
0PARAMETER VALUES FOR THE CHI/Q CALCULATIONS FOR THE  SE SECTOR.
 STABILITY WINDSPEED FREQUENCY DISTANCE TERRAIN HT EFF PLUME HT  SIGMA-Y SIGMA-Z MEANDER-SY  ** CHI/Q VALUES (SEC/CUBIC METER)
   CLASS   METER/SEC  PERCENT   METERS    METERS      METERS      METERS  METERS   METERS        MEANDER   BLDG WAKE        USED
          AT  10.0 METERS                                                                              CA=1006.SQ.METERS

    A         0.1       0.01     4820.        0.          0.       775.2  1000.0    775.2      4.116E-06   4.115E-06   4.115E-06
    A         1.5       3.12     4820.        0.          0.       775.2  1000.0    775.2      2.744E-07   2.743E-07   2.743E-07
```

A	3.0	18.57	4820.	0.	0.	775.2	1000.0	775.2	1.372E-07	1.372E-07	1.372E-07
A	5.0	7.14	4820.	0.	0.	775.2	1000.0	775.2	8.233E-08	8.230E-08	8.230E-08
A	7.5	0.69	4820.	0.	0.	775.2	1000.0	775.2	5.489E-08	5.486E-08	5.486E-08
B	0.1	0.00	4820.	0.	0.	583.0	610.6	583.0	8.964E-06	8.956E-06	8.956E-06
B	1.5	0.34	4820.	0.	0.	583.0	610.6	583.0	5.976E-07	5.971E-07	5.971E-07
B	3.0	1.61	4820.	0.	0.	583.0	610.6	583.0	2.988E-07	2.985E-07	2.985E-07
B	5.0	1.51	4820.	0.	0.	583.0	610.6	583.0	1.793E-07	1.791E-07	1.791E-07
B	7.5	0.45	4820.	0.	0.	583.0	610.6	583.0	1.195E-07	1.194E-07	1.194E-07
C	0.1	0.01	4820.	0.	0.	442.7	256.1	442.7	2.815E-05	2.807E-05	2.807E-05
C	1.5	0.69	4820.	0.	0.	442.7	256.1	442.7	1.877E-06	1.871E-06	1.871E-06
C	3.0	1.51	4820.	0.	0.	442.7	256.1	442.7	9.384E-07	9.357E-07	9.357E-07
C	5.0	1.85	4820.	0.	0.	442.7	256.1	442.7	5.630E-07	5.614E-07	5.614E-07
C	7.5	0.93	4820.	0.	0.	442.7	256.1	442.7	3.753E-07	3.743E-07	3.743E-07
D	0.1	0.13	4820.	0.	0.	311.7	87.2	373.3	9.804E-05	1.160E-04	9.804E-05
D	1.5	2.88	4820.	0.	0.	311.7	87.2	373.3	6.536E-06	7.736E-06	6.536E-06
D	3.0	7.38	4820.	0.	0.	311.7	87.2	345.6	3.529E-06	3.868E-06	3.529E-06
D	5.0	16.82	4820.	0.	0.	311.7	87.2	319.3	2.292E-06	2.321E-06	2.292E-06
D	7.5	16.37	4820.	0.	0.	311.7	87.2	311.7	1.565E-06	1.547E-06	1.547E-06
D	10.0	3.57	4820.	0.	0.	311.7	87.2	311.7	1.174E-06	1.160E-06	1.160E-06
D	15.0	0.34	4820.	0.	0.	311.7	87.2	311.7	7.827E-07	7.736E-07	7.736E-07
E	0.1	0.09	4820.	0.	0.	221.7	55.4	309.2	1.867E-04	2.539E-04	1.867E-04
E	1.5	2.78	4820.	0.	0.	221.7	55.4	309.2	1.245E-05	1.693E-05	1.245E-05
E	3.0	4.73	4820.	0.	0.	221.7	55.4	265.9	7.239E-06	8.463E-06	7.239E-06
E	5.0	3.23	4820.	0.	0.	221.7	55.4	230.7	5.006E-06	5.078E-06	5.006E-06
E	7.5	0.93	4820.	0.	0.	221.7	55.4	221.7	3.473E-06	3.385E-06	3.385E-06
F	0.1	0.02	4820.	0.	0.	153.0	34.5	243.7	3.809E-04	5.719E-04	3.809E-04
F	1.5	1.03	4820.	0.	0.	153.0	34.5	243.7	2.539E-05	3.813E-05	2.539E-05
F	3.0	0.58	4820.	0.	0.	153.0	34.5	195.7	1.581E-05	1.906E-05	1.581E-05
F	5.0	0.11	4820.	0.	0.	153.0	34.5	161.1	1.153E-05	1.144E-05	1.144E-05
G	0.1	0.00	4820.	0.	0.	105.6	21.4	209.9	7.107E-04	1.238E-03	7.107E-04
G	1.5	0.24	4820.	0.	0.	105.6	21.4	209.9	4.738E-05	8.251E-05	4.738E-05
G	3.0	0.34	4820.	0.	0.	105.6	21.4	149.9	3.318E-05	4.126E-05	3.318E-05

1USNRC COMPUTER CODE-PAVAN, VERSION 2.0 RUN DATE: Wed Apr 14 10:41:55 2004

/PLANT NAME: Palisades METEOROLOGICAL INSTRUMENTATION
DATA PERIOD: 1999-2003 WIND SENSORS HEIGHT: 10 Meters DT
TYPE OF RELEASE: Ground Level Release DELTA-T HEIGHTS: from 10m to 60m
SOURCE OF DATA: Data from onsite met tower
COMMENTS: NONE
PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145
0LOW POPULATION ZONE CALCULATIONS:

```
0  SE SECTOR     BOUNDARY DISTANCE = 4820.0 METERS
0LATERAL PLUME MEANDER/BUILDING WAKE CREDIT ALLOWED
 AS A FUNCTION OF DOWNWIND DISTANCE.
 MEANDER CREDIT IS FOR WINDSPEEDS LESS THAN 6 MPS.
 BUILDING WAKE CREDIT ALLOWED:   C=  0.5     A=  2011.     D=   58.5
 CORRECTION FACTORS USED IN THE ANNUAL AVERAGE CALCULATIONS.
0BELOW ARE PRINTED THE ORDERED VALUES OF CHI/Q AND THE FREQUENCY WITH WHICH THAT VALUE IS REACHED OR EXCEEDED.
 THE TOP NUMBER IS THE CHI/Q.  THE MIDDLE NUMBER IS THE FREQUENCY NORMALIZED TO THIS SECTOR.
 THE THIRD NUMBER IS THE FREQUENCY WITH RESPECT TO ALL TIME.
0   7.107E-04   3.809E-04   1.867E-04   9.804E-05   4.738E-05   3.318E-05   2.807E-05   2.539E-05   1.581E-05   1.245E-05
        0.002       0.022       0.108       0.239       0.477       0.821       0.831       1.862       2.444       5.221
      0.00019     0.00193     0.00942     0.02073     0.04140     0.07125     0.07212     0.16167     0.21219     0.45329
0   1.144E-05   8.956E-06   7.239E-06   6.536E-06   5.006E-06   4.115E-06   3.529E-06   3.385E-06   2.292E-06   1.871E-06
        5.327       5.330      10.064      12.947      16.173      16.185      23.565      24.490      41.311      41.999
      0.46247     0.46271     0.87373     1.12402     1.40416     1.40520     2.04585     2.12621     3.58661     3.64631
0   1.547E-06   1.160E-06   9.357E-07   7.736E-07   5.971E-07   5.614E-07   3.743E-07   2.985E-07   2.743E-07   1.791E-07
       58.370      61.941      63.448      63.792      64.136      65.988      66.913      68.527      71.647      73.155
      5.06766     5.37765     5.50853     5.53838     5.56823     5.72897     5.80934     5.94941     6.22036     6.35124
0   1.372E-07   1.194E-07   8.230E-08   5.486E-08
       91.722      92.171      99.312     100.000
      7.96318     8.00222     8.62220     8.68190
0          X/Q PERCENTILES
 (BASED ON THE UPPER ENVELOPE OF THE
 ORDERED X/Q-FREQUENCY VALUES, AND AS
 PLOTTED ON A LOG-NORMAL GRAPH.)
0 PERCENT OF TIME CHI/Q IS EQUALED OR EXCEEDED
        CHI/Q      WITH RESPECT TO     WHEN THE WIND BLOWS
 SEC/CUBIC METER  THE TOTAL TIME      INTO THIS SECTOR ONLY

                                                          HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 2)=   0.002
                                                          HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 3)=   0.009
                                                          HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 4)=   0.453
                                                          HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 5)=   1.123
                                                          HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 6)=   3.583
                                                          HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 7)=   5.064
     4.380E-05             0.087             1.000
     1.940E-05             0.260             3.000
     1.290E-05             0.434             5.000
     7.907E-06             0.868            10.000
     5.778E-06             1.302            15.000
     4.508E-06             1.736            20.000
     3.692E-06             2.170            25.000
     3.120E-06             2.605            30.000
     2.695E-06             3.039            35.000
     2.366E-06             3.473            40.000
     2.085E-06             3.907            45.000
     1.851E-06             4.341            50.000
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     1.659E-06              4.775             55.000
0    1.165E-05              0.5                5.76
0ANNUAL AVERAGE =   2.18E-07
1USNRC COMPUTER CODE-PAVAN, VERSION 2.0          RUN DATE: Wed Apr 14 10:41:55 2004

/PLANT NAME: Palisades                           METEOROLOGICAL INSTRUMENTATION
 DATA PERIOD:  1999-2003                         WIND SENSORS HEIGHT: 10 Meters        DT
 TYPE OF RELEASE: Ground Level Release           DELTA-T HEIGHTS: from 10m to 60m
 SOURCE OF DATA: Data from onsite met tower
 COMMENTS: NONE
 PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145
0PARAMETER VALUES FOR THE CHI/Q CALCULATIONS FOR THE SSE SECTOR.
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STABILITY CLASS	WINDSPEED AT 10.0 METERS METER/SEC	FREQUENCY PERCENT	DISTANCE METERS	TERRAIN HT METERS	EFF PLUME HT METERS	SIGMA-Y METERS	SIGMA-Z METERS	MEANDER-SY METERS	** CHI/Q VALUES (SEC/CUBIC METER) MEANDER	BLDG WAKE CA=1006.SQ.METERS	USED
A	0.1	0.00	4820.	0.	0.	775.2	1000.0	775.2	4.116E-06	4.115E-06	4.115E-06
A	1.5	0.86	4820.	0.	0.	775.2	1000.0	775.2	2.744E-07	2.743E-07	2.743E-07
A	3.0	13.51	4820.	0.	0.	775.2	1000.0	775.2	1.372E-07	1.372E-07	1.372E-07
A	5.0	11.93	4820.	0.	0.	775.2	1000.0	775.2	8.233E-08	8.230E-08	8.230E-08
A	7.5	1.59	4820.	0.	0.	775.2	1000.0	775.2	5.489E-08	5.486E-08	5.486E-08
A	10.0	0.32	4820.	0.	0.	775.2	1000.0	775.2	4.116E-08	4.115E-08	4.115E-08
B	0.1	0.00	4820.	0.	0.	583.0	610.6	583.0	8.964E-06	8.956E-06	8.956E-06
B	1.5	0.54	4820.	0.	0.	583.0	610.6	583.0	5.976E-07	5.971E-07	5.971E-07
B	3.0	1.49	4820.	0.	0.	583.0	610.6	583.0	2.988E-07	2.985E-07	2.985E-07
B	5.0	1.91	4820.	0.	0.	583.0	610.6	583.0	1.793E-07	1.791E-07	1.791E-07
B	7.5	0.64	4820.	0.	0.	583.0	610.6	583.0	1.195E-07	1.194E-07	1.194E-07
B	10.0	0.10	4820.	0.	0.	583.0	610.6	583.0	8.964E-08	8.956E-08	8.956E-08
C	0.1	0.01	4820.	0.	0.	442.7	256.1	442.7	2.815E-05	2.807E-05	2.807E-05
C	1.5	0.42	4820.	0.	0.	442.7	256.1	442.7	1.877E-06	1.871E-06	1.871E-06
C	3.0	2.35	4820.	0.	0.	442.7	256.1	442.7	9.384E-07	9.357E-07	9.357E-07
C	5.0	1.81	4820.	0.	0.	442.7	256.1	442.7	5.630E-07	5.614E-07	5.614E-07
C	7.5	0.86	4820.	0.	0.	442.7	256.1	442.7	3.753E-07	3.743E-07	3.743E-07
C	10.0	0.10	4820.	0.	0.	442.7	256.1	442.7	2.815E-07	2.807E-07	2.807E-07
D	0.1	0.15	4820.	0.	0.	311.7	87.2	373.3	9.804E-05	1.160E-04	9.804E-05
D	1.5	3.30	4820.	0.	0.	311.7	87.2	373.3	6.536E-06	7.736E-06	6.536E-06
D	3.0	10.75	4820.	0.	0.	311.7	87.2	345.6	3.529E-06	3.868E-06	3.529E-06
D	5.0	14.17	4820.	0.	0.	311.7	87.2	319.3	2.292E-06	2.321E-06	2.292E-06
D	7.5	11.93	4820.	0.	0.	311.7	87.2	311.7	1.565E-06	1.547E-06	1.547E-06
D	10.0	2.88	4820.	0.	0.	311.7	87.2	311.7	1.174E-06	1.160E-06	1.160E-06
D	15.0	0.10	4820.	0.	0.	311.7	87.2	311.7	7.827E-07	7.736E-07	7.736E-07
E	0.1	0.10	4820.	0.	0.	221.7	55.4	309.2	1.867E-04	2.539E-04	1.867E-04
E	1.5	3.20	4820.	0.	0.	221.7	55.4	309.2	1.245E-05	1.693E-05	1.245E-05

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    E         3.0       7.55     4820.        0.          0.       221.7    55.4    265.9      7.239E-06   8.463E-06   7.239E-06
    E         5.0       3.62     4820.        0.          0.       221.7    55.4    230.7      5.006E-06   5.078E-06   5.006E-06
    E         7.5       0.64     4820.        0.          0.       221.7    55.4    221.7      3.473E-06   3.385E-06   3.385E-06
    E        10.0       0.10     4820.        0.          0.       221.7    55.4    221.7      2.605E-06   2.539E-06   2.539E-06

    F         0.1       0.02     4820.        0.          0.       153.0    34.5    243.7      3.809E-04   5.719E-04   3.809E-04
    F         1.5       1.17     4820.        0.          0.       153.0    34.5    243.7      2.539E-05   3.813E-05   2.539E-05
    F         3.0       0.95     4820.        0.          0.       153.0    34.5    195.7      1.581E-05   1.906E-05   1.581E-05
    F         5.0       0.10     4820.        0.          0.       153.0    34.5    161.1      1.153E-05   1.144E-05   1.144E-05

    G         0.1       0.00     4820.        0.          0.       105.6    21.4    209.9      7.107E-04   1.238E-03   7.107E-04
    G         1.5       0.32     4820.        0.          0.       105.6    21.4    209.9      4.738E-05   8.251E-05   4.738E-05
    G         3.0       0.54     4820.        0.          0.       105.6    21.4    149.9      3.318E-05   4.126E-05   3.318E-05
1USNRC COMPUTER CODE-PAVAN, VERSION 2.0          RUN DATE: Wed Apr 14 10:41:55 2004

/PLANT NAME: Palisades                           METEOROLOGICAL INSTRUMENTATION
 DATA PERIOD:  1999-2003                         WIND SENSORS HEIGHT: 10 Meters        DT
 TYPE OF RELEASE: Ground Level Release           DELTA-T HEIGHTS: from 10m to 60m
 SOURCE OF DATA: Data from onsite met tower
 COMMENTS: NONE
 PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145
0LOW POPULATION ZONE CALCULATIONS:
0 SSE SECTOR     BOUNDARY DISTANCE = 4820.0 METERS
0LATERAL PLUME MEANDER/BUILDING WAKE CREDIT ALLOWED
 AS A FUNCTION OF DOWNWIND DISTANCE.
 MEANDER CREDIT IS FOR WINDSPEEDS LESS THAN 6 MPS.
 BUILDING WAKE CREDIT ALLOWED:   C=  0.5     A=  2011.     D=   58.5
 CORRECTION FACTORS USED IN THE ANNUAL AVERAGE CALCULATIONS.
0BELOW ARE PRINTED THE ORDERED VALUES OF CHI/Q AND THE FREQUENCY WITH WHICH THAT VALUE IS REACHED OR EXCEEDED.
 THE TOP NUMBER IS THE CHI/Q.  THE MIDDLE NUMBER IS THE FREQUENCY NORMALIZED TO THIS SECTOR.
 THE THIRD NUMBER IS THE FREQUENCY WITH RESPECT TO ALL TIME.
0   7.107E-04   3.809E-04   1.867E-04   9.804E-05   4.738E-05   3.318E-05   2.807E-05   2.539E-05   1.581E-05   1.245E-05
        0.003       0.026       0.125       0.274       0.592       1.130       1.136       2.309       3.262       6.463
      0.00028     0.00241     0.01176     0.02577     0.05563     0.10614     0.10671     0.21693     0.30648     0.60728
0   1.144E-05   8.956E-06   7.239E-06   6.536E-06   5.006E-06   4.115E-06   3.529E-06   3.385E-06   2.539E-06   2.292E-06
        6.561       6.566      14.117      17.417      21.034      21.037      31.790      32.426      32.523      46.698
      0.61647     0.61687     1.32640     1.63639     1.97623     1.97654     2.98687     3.04657     3.05576     4.38756
0   1.871E-06   1.547E-06   1.160E-06   9.357E-07   7.736E-07   5.971E-07   5.614E-07   3.743E-07   2.985E-07   2.807E-07
       47.114      59.040      61.924      64.270      64.368      64.905      66.714      67.569      69.060      69.158
      4.42659     5.54715     5.81810     6.03854     6.04772     6.09824     6.26816     6.34852     6.48859     6.49778
0   2.743E-07   1.791E-07   1.372E-07   1.194E-07   8.956E-08   8.230E-08   5.486E-08   4.115E-08
       70.013      71.919      85.434      86.070      86.167      98.094      99.682     100.000
      6.57814     6.75725     8.02705     8.08675     8.09594     9.21649     9.36574     9.39559
0          X/Q PERCENTILES
 (BASED ON THE UPPER ENVELOPE OF THE
 ORDERED X/Q-FREQUENCY VALUES, AND AS
 PLOTTED ON A LOG-NORMAL GRAPH.)
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0 PERCENT OF TIME CHI/Q IS EQUALED OR EXCEEDED
        CHI/Q      WITH RESPECT TO     WHEN THE WIND BLOWS
 SEC/CUBIC METER  THE TOTAL TIME      INTO THIS SECTOR ONLY

                                                    HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 2)=   0.002
                                                    HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 3)=   0.012
                                                    HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 4)=   0.607
                                                    HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 5)=   1.635
                                                    HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 6)=   2.984
                                                    HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 7)=   4.384
                                                    HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 8)=   5.543
     5.001E-05              0.094             1.000
     2.274E-05              0.282             3.000
     1.531E-05              0.470             5.000
     9.468E-06              0.940            10.000
     7.242E-06              1.409            15.000
     5.701E-06              1.879            20.000
     4.546E-06              2.349            25.000
     3.755E-06              2.819            30.000
     3.177E-06              3.288            35.000
     2.737E-06              3.758            40.000
     2.393E-06              4.228            45.000
     2.048E-06              4.698            50.000
     1.746E-06              5.168            55.000
0    1.457E-05              0.5               5.32
0ANNUAL AVERAGE =   2.68E-07
1USNRC COMPUTER CODE-PAVAN, VERSION 2.0          RUN DATE: Wed Apr 14 10:41:55 2004

/PLANT NAME: Palisades                           METEOROLOGICAL INSTRUMENTATION
 DATA PERIOD:  1999-2003                         WIND SENSORS HEIGHT: 10 Meters       DT
 TYPE OF RELEASE: Ground Level Release           DELTA-T HEIGHTS: from 10m to 60m
 SOURCE OF DATA: Data from onsite met tower
 COMMENTS: NONE
 PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145
0PARAMETER VALUES FOR THE CHI/Q CALCULATIONS FOR THE ALL SECTOR.
 STABILITY WINDSPEED FREQUENCY DISTANCE TERRAIN HT EFF PLUME HT  SIGMA-Y SIGMA-Z MEANDER-SY  ** CHI/Q VALUES (SEC/CUBIC METER)
   CLASS   METER/SEC  PERCENT   METERS    METERS      METERS      METERS  METERS   METERS        MEANDER   BLDG WAKE        USED
          AT  10.0 METERS                                                                              CA=1006.SQ.METERS

    A         0.1       0.00     4820.        0.          0.       775.2  1000.0    775.2      4.116E-06   4.115E-06   4.115E-06
    A         1.5       1.19     4820.        0.          0.       775.2  1000.0    775.2      2.744E-07   2.743E-07   2.743E-07
    A         3.0       8.30     4820.        0.          0.       775.2  1000.0    775.2      1.372E-07   1.372E-07   1.372E-07
    A         5.0       5.74     4820.        0.          0.       775.2  1000.0    775.2      8.233E-08   8.230E-08   8.230E-08
    A         7.5       0.81     4820.        0.          0.       775.2  1000.0    775.2      5.489E-08   5.486E-08   5.486E-08
    A        10.0       0.08     4820.        0.          0.       775.2  1000.0    775.2      4.116E-08   4.115E-08   4.115E-08

    B         0.1       0.00     4820.        0.          0.       583.0   610.6    583.0      8.964E-06   8.956E-06   8.956E-06
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B	1.5	0.29	4820.	0.	0.	583.0	610.6	583.0	5.976E-07	5.971E-07	5.971E-07
B	3.0	1.09	4820.	0.	0.	583.0	610.6	583.0	2.988E-07	2.985E-07	2.985E-07
B	5.0	1.37	4820.	0.	0.	583.0	610.6	583.0	1.793E-07	1.791E-07	1.791E-07
B	7.5	0.33	4820.	0.	0.	583.0	610.6	583.0	1.195E-07	1.194E-07	1.194E-07
B	10.0	0.04	4820.	0.	0.	583.0	610.6	583.0	8.964E-08	8.956E-08	8.956E-08
C	0.1	0.00	4820.	0.	0.	442.7	256.1	442.7	2.815E-05	2.807E-05	2.807E-05
C	1.5	0.32	4820.	0.	0.	442.7	256.1	442.7	1.877E-06	1.871E-06	1.871E-06
C	3.0	1.38	4820.	0.	0.	442.7	256.1	442.7	9.384E-07	9.357E-07	9.357E-07
C	5.0	1.68	4820.	0.	0.	442.7	256.1	442.7	5.630E-07	5.614E-07	5.614E-07
C	7.5	0.65	4820.	0.	0.	442.7	256.1	442.7	3.753E-07	3.743E-07	3.743E-07
C	10.0	0.03	4820.	0.	0.	442.7	256.1	442.7	2.815E-07	2.807E-07	2.807E-07
D	0.1	0.12	4820.	0.	0.	311.7	87.2	311.7	1.174E-04	1.160E-04	1.160E-04
D	1.5	2.69	4820.	0.	0.	311.7	87.2	311.7	7.827E-06	7.736E-06	7.736E-06
D	3.0	9.80	4820.	0.	0.	311.7	87.2	311.7	3.914E-06	3.868E-06	3.868E-06
D	5.0	15.75	4820.	0.	0.	311.7	87.2	311.7	2.348E-06	2.321E-06	2.321E-06
D	7.5	9.02	4820.	0.	0.	311.7	87.2	311.7	1.565E-06	1.547E-06	1.547E-06
D	10.0	1.39	4820.	0.	0.	311.7	87.2	311.7	1.174E-06	1.160E-06	1.160E-06
D	15.0	0.10	4820.	0.	0.	311.7	87.2	311.7	7.827E-07	7.736E-07	7.736E-07
E	0.1	0.10	4820.	0.	0.	221.7	55.4	221.7	2.605E-04	2.539E-04	2.539E-04
E	1.5	3.33	4820.	0.	0.	221.7	55.4	221.7	1.737E-05	1.693E-05	1.693E-05
E	3.0	10.54	4820.	0.	0.	221.7	55.4	221.7	8.683E-06	8.463E-06	8.463E-06
E	5.0	6.69	4820.	0.	0.	221.7	55.4	221.7	5.210E-06	5.078E-06	5.078E-06
E	7.5	1.55	4820.	0.	0.	221.7	55.4	221.7	3.473E-06	3.385E-06	3.385E-06
E	10.0	0.18	4820.	0.	0.	221.7	55.4	221.7	2.605E-06	2.539E-06	2.539E-06
E	14.9	0.01	4820.	0.	0.	221.7	55.4	221.7	1.737E-06	1.693E-06	1.693E-06
F	0.1	0.04	4820.	0.	0.	153.0	34.5	153.0	6.066E-04	5.719E-04	5.719E-04
F	1.5	2.01	4820.	0.	0.	153.0	34.5	153.0	4.044E-05	3.813E-05	3.813E-05
F	3.0	4.96	4820.	0.	0.	153.0	34.5	153.0	2.022E-05	1.906E-05	1.906E-05
F	5.0	0.89	4820.	0.	0.	153.0	34.5	153.0	1.213E-05	1.144E-05	1.144E-05
F	7.5	0.03	4820.	0.	0.	153.0	34.5	153.0	8.088E-06	7.625E-06	7.625E-06
F	10.0	0.01	4820.	0.	0.	153.0	34.5	153.0	6.066E-06	5.719E-06	5.719E-06
G	0.1	0.01	4820.	0.	0.	105.6	21.4	105.6	1.413E-03	1.238E-03	1.238E-03
G	1.5	1.24	4820.	0.	0.	105.6	21.4	105.6	9.418E-05	8.251E-05	8.251E-05
G	3.0	5.75	4820.	0.	0.	105.6	21.4	105.6	4.709E-05	4.126E-05	4.126E-05
G	5.0	0.50	4820.	0.	0.	105.6	21.4	105.6	2.825E-05	2.475E-05	2.475E-05

1USNRC COMPUTER CODE-PAVAN, VERSION 2.0 RUN DATE: Wed Apr 14 10:41:55 2004

/PLANT NAME: Palisades METEOROLOGICAL INSTRUMENTATION
DATA PERIOD: 1999-2003 WIND SENSORS HEIGHT: 10 Meters DT
TYPE OF RELEASE: Ground Level Release DELTA-T HEIGHTS: from 10m to 60m
SOURCE OF DATA: Data from onsite met tower
COMMENTS: NONE

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 PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145
0LOW POPULATION ZONE CALCULATIONS:
 DIRECTION-INDEPENDENT (S.R.P 2.3.4) MODEL.
 MINIMUM BOUNDARY DISTANCE = 4820.0 METERS.
 BUILDING WAKE CREDIT ALLOWED:   C=  0.5     A=  2011.     D=   58.5
 CORRECTION FACTORS USED IN THE ANNUAL AVERAGE CALCULATIONS.
0BELOW ARE PRINTED THE ORDERED VALUES OF CHI/Q AND THE FREQUENCY WITH WHICH THAT VALUE IS REACHED OR EXCEEDED.
 THE TOP NUMBER IS THE CHI/Q.  THE MIDDLE NUMBER IS THE FREQUENCY NORMALIZED TO THIS SECTOR.
 THE THIRD NUMBER IS THE FREQUENCY WITH RESPECT TO ALL TIME.
0   1.238E-03   5.719E-04   2.539E-04   1.160E-04   8.251E-05   4.126E-05   3.813E-05   2.807E-05   2.475E-05   1.906E-05
        0.011       0.051       0.154       0.276       1.520       7.274       9.286       9.290       9.786      14.751
      0.01148     0.05052     0.15385     0.27555     1.52009     7.27440     9.28588     9.29047     9.78645    14.75086
0   1.693E-05   1.144E-05   8.956E-06   8.463E-06   7.736E-06   7.625E-06   5.719E-06   5.078E-06   4.115E-06   3.868E-06
       18.078      18.969      18.971      29.506      32.197      32.227      32.237      38.923      38.928      48.726
     18.07807    18.96900    18.97130    29.50632    32.19748    32.22733    32.23651    38.92308    38.92767    48.72560
0   3.385E-06   2.539E-06   2.321E-06   1.871E-06   1.693E-06   1.547E-06   1.160E-06   9.357E-07   7.736E-07   5.971E-07
       50.280      50.457      66.207      66.524      66.533      75.550      76.941      78.321      78.420      78.707
     50.28014    50.45694    66.20666    66.52354    66.53272    75.54994    76.94144    78.32146    78.42020    78.70723
0   5.614E-07   3.743E-07   2.985E-07   2.807E-07   2.743E-07   1.791E-07   1.372E-07   1.194E-07   8.956E-08   8.230E-08
       80.388      81.038      82.129      82.156      83.346      84.716      93.013      93.341      93.378      99.114
     80.38805    81.03788    82.12858    82.15614    83.34557    84.71641    93.01262    93.34098    93.37772    99.11366
0   5.486E-08   4.115E-08
       99.920     100.000
     99.91963   100.00000
0          X/Q PERCENTILES
 (BASED ON THE UPPER ENVELOPE OF THE
 ORDERED X/Q-FREQUENCY VALUES, AND AS
 PLOTTED ON A LOG-NORMAL GRAPH.)
0 PERCENT OF TIME CHI/Q IS EQUALED OR EXCEEDED
        CHI/Q      WITH RESPECT TO     WHEN THE WIND BLOWS
 SEC/CUBIC METER  THE TOTAL TIME      INTO THIS SECTOR ONLY

                                                                HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 2)=   9.282
     1.673E-04              1.000              1.000
     8.675E-05              3.000              3.000
     6.126E-05              5.000              5.000
     3.529E-05             10.000             10.000
     2.241E-05             15.000             15.000
     1.562E-05             20.000             20.000
     1.146E-05             25.000             25.000
     8.681E-06             30.000             30.000
     6.963E-06             35.000             35.000
     5.812E-06             40.000             40.000
     4.881E-06             45.000             45.000
     4.111E-06             50.000             50.000
     3.463E-06             55.000             55.000
     2.908E-06             60.000             60.000
```

```
     2.427E-06             65.000             65.000
     2.007E-06             70.000             70.000
     1.634E-06             75.000             75.000
     1.300E-06             80.000             80.000
     9.954E-07             85.000             85.000
     7.116E-07             90.000             90.000
0    6.126E-05              5.0                5.00
1USNRC COMPUTER CODE-PAVAN, VERSION 2.0          RUN DATE: Wed Apr 14 10:41:55 2004

/PLANT NAME: Palisades                           METEOROLOGICAL INSTRUMENTATION
 DATA PERIOD:  1999-2003                         WIND SENSORS HEIGHT: 10 Meters       DT
 TYPE OF RELEASE: Ground Level Release           DELTA-T HEIGHTS: from 10m to 60m
 SOURCE OF DATA: Data from onsite met tower
 COMMENTS: NONE
 PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145
0LOW POPULATION ZONE CALCULATIONS:
0FIVE PERCENT OVERALL SITE LIMIT
 BUILDING WAKE CREDIT ALLOWED:   C=  0.5     A=  2011.     D=   58.5
 CORRECTION FACTORS USED IN THE ANNUAL AVERAGE CALCULATIONS.
0BELOW ARE PRINTED THE ORDERED VALUES OF CHI/Q AND THE FREQUENCY WITH WHICH THAT VALUE IS REACHED OR EXCEEDED.
 THE TOP NUMBER IS THE CHI/Q.  THE MIDDLE NUMBER IS THE FREQUENCY NORMALIZED TO THIS SECTOR.
 THE THIRD NUMBER IS THE FREQUENCY WITH RESPECT TO ALL TIME.
0   7.107E-04   3.809E-04   1.867E-04   9.804E-05   4.738E-05   3.318E-05   2.807E-05   2.539E-05   2.475E-05   1.581E-05
        0.011       0.051       0.154       0.276       1.520       7.274       7.279       9.290       9.786      14.751
      0.01148     0.05052     0.15385     0.27555     1.52009     7.27440     7.27899     9.29047     9.78645    14.75086
0   1.245E-05   1.144E-05   8.956E-06   7.625E-06   7.239E-06   6.536E-06   5.719E-06   5.006E-06   4.115E-06   3.529E-06
       18.078      18.969      18.971      19.001      29.536      32.227      32.237      38.923      38.928      48.726
     18.07807    18.96901    18.97131    19.00116    29.53617    32.22733    32.23652    38.92308    38.92768    48.72562
0   3.385E-06   2.539E-06   2.292E-06   1.871E-06   1.693E-06   1.547E-06   1.160E-06   9.357E-07   7.736E-07   5.971E-07
       50.280      50.457      66.207      66.524      66.533      75.550      76.941      78.321      78.420      78.707
      50.28015    50.45696    66.20667    66.52356    66.53275    75.54997    76.94147    78.32150    78.42024    78.70727
0   5.614E-07   3.743E-07   2.985E-07   2.807E-07   2.743E-07   1.791E-07   1.372E-07   1.194E-07   8.956E-08   8.230E-08
       80.388      81.038      82.129      82.156      83.346      84.716      93.013      93.341      93.378      99.114
      80.38811    81.03795    82.12865    82.15621    83.34563    84.71647    93.01267    93.34104    93.37778    99.11373
0   5.486E-08   4.115E-08
       99.920     100.000
      99.91970   100.00008
0          X/Q PERCENTILES
 (BASED ON THE UPPER ENVELOPE OF THE
 ORDERED X/Q-FREQUENCY VALUES, AND AS
 PLOTTED ON A LOG-NORMAL GRAPH.)
0 PERCENT OF TIME CHI/Q IS EQUALED OR EXCEEDED
        CHI/Q      WITH RESPECT TO     WHEN THE WIND BLOWS
 SEC/CUBIC METER  THE TOTAL TIME      INTO THIS SECTOR ONLY

0                                                    ERROR IN NORMAL TRANSFORMATION FOR A( 42)= 100.00008
                                                      HANDCHECK GRAPH:  SLOPE LT -1.0 FOR LOW PERCENTAGES.  XSAVE( 2)=   7.271
```

```
     1.099E-04             1.000             1.000
     5.955E-05             3.000             3.000
     4.304E-05             5.000             5.000
     2.486E-05            10.000            10.000
     1.655E-05            15.000            15.000
     1.198E-05            20.000            20.000
     9.081E-06            25.000            25.000
     7.123E-06            30.000            30.000
     6.024E-06            35.000            35.000
     5.139E-06            40.000            40.000
     4.408E-06            45.000            45.000
     3.790E-06            50.000            50.000
     3.259E-06            55.000            55.000
     2.795E-06            60.000            60.000
     2.384E-06            65.000            65.000
     1.983E-06            70.000            70.000
     1.616E-06            75.000            75.000
     1.286E-06            80.000            80.000
     9.859E-07            85.000            85.000
     7.057E-07            90.000            90.000
0    4.304E-05             5.0               5.00
1USNRC COMPUTER CODE-PAVAN, VERSION 2.0          RUN DATE: Wed Apr 14 10:41:55 2004

/PLANT NAME: Palisades                           METEOROLOGICAL INSTRUMENTATION
 DATA PERIOD:  1999-2003                         WIND SENSORS HEIGHT: 10 Meters       DT
 TYPE OF RELEASE: Ground Level Release           DELTA-T HEIGHTS: from 10m to 60m
 SOURCE OF DATA: Data from onsite met tower
 COMMENTS: NONE
 PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145
0                                  RELATIVE CONCENTRATION (X/Q) VALUES (SEC/CUBIC METER)
                                                    VERSUS                                  HOURS PER YEAR MAX
                                                AVERAGING TIME                                   0-2 HR X/Q IS
 DOWNWIND DISTANCE                                                                               EXCEEDED  DOWNWIND
 SECTOR   (METERS)        0-2 HOURS      0-8 HOURS     8-24 HOURS       1-4 DAYS      4-30 DAYS ANNUAL AVERAGE IN SECTOR    SECTOR
      S     4820.          1.68E-05       8.22E-06       5.75E-06       2.65E-06       8.68E-07       2.22E-07       5.8         S
    SSW     4820.          1.57E-05       7.42E-06       5.10E-06       2.26E-06       7.06E-07       1.69E-07     217.8       SSW
     SW     4820.          1.92E-05       8.90E-06       6.06E-06       2.63E-06       7.93E-07       1.83E-07       6.3        SW
    WSW     4820.          2.56E-05       1.14E-05       7.59E-06       3.14E-06       8.88E-07       1.89E-07       9.7       WSW
      W     4820.          3.22E-05       1.41E-05       9.36E-06       3.83E-06       1.06E-06       2.21E-07      12.5         W
    WNW     4820.          3.95E-05       1.72E-05       1.14E-05       4.62E-06       1.27E-06       2.61E-07      16.7       WNW
     NW     4820.          5.37E-05       2.36E-05       1.56E-05       6.41E-06       1.78E-06       3.72E-07      28.9        NW
    NNW     4820.          6.66E-05       3.03E-05       2.04E-05       8.67E-06       2.54E-06       5.65E-07      43.7       NNW
      N     4820.          6.37E-05       2.87E-05       1.93E-05       8.13E-06       2.35E-06       5.15E-07      40.5         N
    NNE     4820.          3.12E-05       1.40E-05       9.42E-06       3.97E-06       1.14E-06       2.50E-07      12.6       NNE
     NE     4820.          1.40E-05       7.01E-06       4.96E-06       2.35E-06       8.02E-07       2.15E-07       4.1        NE
    ENE     4820.          1.05E-05       5.31E-06       3.79E-06       1.81E-06       6.31E-07       1.73E-07       3.0       ENE
      E     4820.          9.52E-06       4.83E-06       3.44E-06       1.65E-06       5.72E-07       1.57E-07       2.6         E
```

ESE	4820.	1.00E-05	5.11E-06	3.65E-06	1.75E-06	6.13E-07	1.69E-07	2.6	ESE
SE	4820.	1.16E-05	6.03E-06	4.34E-06	2.13E-06	7.62E-07	2.18E-07	4.1	SE
SSE	4820.	1.46E-05	7.53E-06	5.41E-06	2.64E-06	9.45E-07	2.68E-07	5.4	SSE
MAX X/Q		6.66E-05				TOTAL HOURS AROUND SITE:		416.5	
SRP 2.3.4	4820.	6.13E-05	2.82E-05	1.92E-05	8.27E-06	2.47E-06	5.65E-07		
SITE LIMIT		4.30E-05	2.10E-05	1.47E-05	6.76E-06	2.21E-06	5.65E-07		

00.5 PERCENT X/Q TO AN INDIVIDUAL IS LIMITING.
0**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.

ATTACHMENT C

CD Electronic File Listing

```
 Volume in drive E has no label
 Volume Serial Number is 123E-11D9
 Directory of E:\Projects\Joe\Palisades CR Habitability\XQ\PalCDAttC

.              <DIR>        09-14-04  2:13p .
..             <DIR>        09-14-04  2:13p ..
PAL03    RSF           398  06-24-04 11:48a PAL03.RSF
PAL01    LOG         4,837  06-24-04 11:47a pal01.log
PAL01    RSF           398  06-24-04 11:47a PAL01.RSF
PAL02    CFD        11,168  06-24-04 11:47a pal02.cfd
PAL02    LOG         4,837  06-24-04 11:47a pal02.log
PAL02    RSF           398  06-24-04 11:47a PAL02.RSF
PAL03    CFD        11,168  06-24-04 11:48a pal03.cfd
PAL03    LOG         4,837  06-24-04 11:48a pal03.log
PAL01    CFD        11,168  06-24-04 11:47a pal01.cfd
PAL19    CFD        11,168  09-08-04  4:20p pal19.cfd
PAL04    LOG         4,837  06-24-04 11:52a pal04.log
PAL04    RSF           398  06-24-04 11:52a PAL04.RSF
PAL05    CFD        11,168  06-24-04 11:52a pal05.cfd
PAL05    LOG         4,837  06-24-04 11:52a pal05.log
PAL05    RSF           398  06-24-04 11:52a PAL05.RSF
PAL06    CFD        11,168  06-24-04 11:53a pal06.cfd
PAL06    LOG         4,837  06-24-04 11:53a pal06.log
PAL06    RSF           398  06-24-04 11:53a PAL06.RSF
PAL07    CFD        11,168  06-24-04 11:54a pal07.cfd
PAL07    LOG         4,837  06-24-04 11:54a pal07.log
PAL07    RSF           398  06-24-04 11:54a PAL07.RSF
PAL08    CFD        11,168  06-24-04 11:54a pal08.cfd
PAL08    LOG         4,837  06-24-04 11:54a pal08.log
PAL08    RSF           398  06-24-04 11:54a PAL08.RSF
PAL09    CFD        11,168  06-24-04 11:55a pal09.cfd
PAL09    LOG         4,837  06-24-04 11:55a pal09.log
PAL09    RSF           398  06-24-04 11:55a PAL09.RSF
PAL10    CFD        11,168  06-29-04 12:23p pal10.cfd
PAL10    LOG         4,837  06-29-04 12:23p pal10.log
PAL10    RSF           398  06-29-04 12:23p PAL10.RSF
PAL10QA  CFD        11,168  06-30-04  1:19p pal10qa.cfd
PAL10QA  LOG         4,997  06-30-04  1:19p pal10qa.log
PAL10QA  QAO     4,922,141  06-30-04  1:19p pal10qa.qao
PAL10QA  RSF           398  06-30-04  1:18p PAL10QA.RSF
PAL11    CFD        11,168  06-29-04 12:24p pal11.cfd
PAL11    LOG         4,837  06-29-04 12:24p pal11.log
PAL11    RSF           398  06-29-04 12:24p PAL11.RSF
PAL12    CFD        11,168  06-29-04 12:25p pal12.cfd
PAL12    LOG         4,837  06-29-04 12:25p pal12.log
PAL12    RSF           398  06-29-04 12:25p PAL12.RSF
PAL13    CFD        11,168  06-29-04 12:26p pal13.cfd
PAL13    LOG         4,837  06-29-04 12:26p pal13.log
PAL13    RSF           398  06-29-04 12:26p PAL13.RSF
PAL14    CFD        11,168  06-29-04 12:27p pal14.cfd
PAL14    LOG         4,837  06-29-04 12:27p pal14.log
PAL14    RSF           398  06-29-04 12:27p PAL14.RSF
PAL15    CFD        11,168  06-29-04 12:28p pal15.cfd
PAL15    LOG         4,837  06-29-04 12:28p pal15.log
```

```
PAL15    RSF           398  06-29-04 12:28p PAL15.RSF
PAL16    CFD        11,168  06-28-04  6:13p pal16.cfd
PAL16    LOG         4,837  06-28-04  6:13p pal16.log
PAL16    RSF           398  06-28-04  6:13p PAL16.RSF
PAL17    CFD        11,168  06-28-04  6:14p pal17.cfd
PAL17    LOG         4,837  06-28-04  6:14p pal17.log
PAL17    RSF           398  06-28-04  6:14p PAL17.RSF
PAL18    CFD        11,168  06-09-04  3:23p pal18.cfd
PAL18    LOG         4,837  06-09-04  3:23p pal18.log
PAL18    RSF           398  06-09-04  3:23p PAL18.RSF
PAL04    CFD        11,168  06-24-04 11:52a pal04.cfd
PAL19    LOG         4,837  09-08-04  4:20p pal19.log
PAL19    RSF           398  09-08-04  4:20p PAL19.RSF
PAL20    CFD        11,168  09-08-04  4:21p pal20.cfd
PAL20    LOG         4,837  09-08-04  4:21p pal20.log
PAL20    RSF           398  09-08-04  4:21p PAL20.RSF
PAL21    CFD        11,168  09-08-04  4:22p pal21.cfd
PAL21    LOG         4,837  09-08-04  4:22p pal21.log
PAL21    RSF           398  09-08-04  4:22p PAL21.RSF
PAL22    CFD        11,168  09-08-04  4:23p pal22.cfd
PAL22    LOG         4,837  09-08-04  4:23p pal22.log
PAL22    RSF           398  09-08-04  4:23p PAL22.RSF
PAL23    CFD        11,168  09-08-04  4:24p pal23.cfd
PAL23    LOG         4,837  09-08-04  4:24p pal23.log
PAL23    RSF           398  09-08-04  4:24p PAL23.RSF
PAL24    CFD        11,168  09-08-04  4:25p pal24.cfd
PAL24    LOG         4,837  09-08-04  4:25p pal24.log
PAL24    RSF           398  09-08-04  4:25p PAL24.RSF
PAL9903  MET     1,621,486  04-01-04  6:37p pal9903.met
PALSIN~1 DAT         4,373  04-14-04 10:41a palsinput.dat
PALS01             378,375  04-14-04 10:41a pals01
PALMET~1 XLS     8,274,432  04-14-04  4:21p palmetdata.xls
ARCON9~1 TXT       324,195  03-03-04  3:44p ARCON96 2003.txt
PALISA~1 ZIP       428,930  03-03-04  4:44p Palisades ARCON96.zip
ARCON9~2 TXT       324,091  03-03-04  3:43p ARCON96 2002.txt
ARCON9~3 TXT       324,153  03-03-04  3:42p ARCON96 2001.txt
ARCON9~4 TXT       325,082  03-03-04  3:41p ARCON96 2000.txt
ARCON9~5 TXT       324,193  03-03-04  3:36p ARCON96 1999.txt
METTOW~1 PDF       155,729  02-13-04 12:53p MET tower data.pdf
JFD9903  XLS       122,368  03-19-04 10:02a jfd9903.xls
JFD9903  TXT        16,720  03-17-04  6:12p jfd9903.txt
ARCON9~6 TXT     1,621,706  03-18-04  5:12p ARCON969903.txt
PAL_DOSE ZIP        66,229  02-12-04  2:39p PAL_DOSE.ZIP
PAL2003  INP         4,478  02-12-04  1:22p PAL2003.INP
PAL9903  INP         4,478  02-12-04  1:06p PAL9903.INP
PALXQD~1 DOC       209,408  02-12-04 10:02a PALXQDQ2003.DOC
PALXQD~2 DOC       204,800  02-12-04  9:52a PALXQDQ9903.DOC
FILELIST                 0  09-14-04  2:41p filelist
        96 file(s)     20,067,602 bytes
         2 dir(s)       15,419.94 MB free
```

ATTACHMENT D

ARCON96 Cases Input Reference Compilation

References [7], [12], [13], [14] and [15]

Email from Gary Pratt (Palisades) to Joe Sinodis (NAI), "X/Q Input Data," with attachment, June 23, 2004

Subject: X/Q Input Data
Date: Wed, 23 Jun 2004 17:57:36 -0400
From: "Pratt, Gary F." <GARY.PRATT@nmcco.com>
To: "Joe Sinodis (E-mail)" <joe.sinodis@numerical.com>
CC: "Jim Harrell (E-mail)" <Jim.Harrell@numerical.com>, "Brogan, Brian A." <BRIAN.BROGAN@nmcco.com>, "Voskuil, Jeffrey L." <JEFFREY.VOSKUIL@nmcco.com>

Joe

The attached file contains revised data for closest containment release point and new data for SIRW Tank and Stack Vent release points. Your comment on the containment-emergency inlet was included. Data that has changed since my last letter are high lighted in the table on page 1. Data for the three release points has been reviewed by Jeff.

If you have any questions, please call me.

Gary

<<XQ Input Tech Review.doc>>

Atmospheric Dispersion Factors

Input	*Units*	Value or Range	*Ref.*	*Notes*
Release height	m	See release/receptor combination table below		Release heights may be taken as actual elevations less the grade elevation.
Horizontal distance from source to intake	m	See release/receptor combination table below		Horizontal distances will likely be calculated as straight line distances based on trigonometric layout of release and receptor points in relation to the N-S and E-W plant axes. For some scenarios, this may conservatively result in the distance line passing through an intervening structure.
Direction from intake to source (w/r/t true north)	deg	See release/receptor combination table below		Angles will be calculated based on trigonometric layout of release and receptor points in relation to the N-S and E-W axes. Direction values will be corrected for plant N offset from true N if necessary. Direction is as if you were standing at the receptor and facing the release point.

Release/Receptor Combination Table

Release Point	Receptor Point	Release Height (ft)	Release Height (m)	Receptor Height (ft)	Receptor Height (m)	Distance (ft)	Distance (m)	Direction with respect to true North	Reference
Closest Containment Point	Normal Control Room Intake "A"		22.53		22.53		24.20	168.2	See below
Closest Containment Point	Normal Control Room Intake "B"		22.53		22.53		21.49	174.2	See below
Closest Containment Point	Emergency Control Room Intake		14.94		14.94		95.05	202.2	See below
SIRW Tank Vent	Normal Control Room Intake "A"		24.51		22.53		10.56	156.6	See below
SIRW Tank Vent	Normal Control Room Intake "B"		24.51		22.53		7.71	184.3	See below
SIRW Tank Vent	Emergency Control Room Intake		24.51		14.94		81.19	213.9	See below
Stack Vent	Normal Control Room Intake "A"		58.52		22.53		22.27	168.5	See below
Stack Vent	Normal Control Room Intake "B"		58.52		22.53		19.83	181.0	See below
Stack Vent	Emergency Control Room Intake		58.52		14.94		97.45	209.1	See below

Containment Surface Area Source – Emergency Intake

Receptor Data:

Containment Radius:

R_{cont} =
+58’0” (Drawing C-127 Containment inside radius)
+3’6” (Drawing C-127 Containment wall thickness)
=61’6” = 18.7452 m

Location of Emergency Intake:

X (West):
+26’0” (Drawing M-990 Cont CL to G)
-16’0” (Drawing M-990 G to F6)
-13’9 1/2” (Drawing M-990 F6 to F4)
-20’2 1/2” (Drawing M-990 F4 to F)
-38’6” (Drawing M-990 F to C)
+75’2” (Drawing M-990 C to F7)
-9’2” (Drawing M-990 F7 to inlet CL)
=3’6” = 1.067 m

Y (North)
Y =
+ 2’ 4” (Drawing M-990 Intake to Service Building Wall)
+ 144’ 0” (Drawing M-990 '41' to '33.3,' 6 spaces @ 24' = 144')
+ 15’ 6” (Drawing M-990 '33.3' to '33.2')
+ 10’ 0” (Drawing M-990 '33.2' to '33.1')
+ 2’ 6” (Drawing M-990 '33.1' to '33')
+ 17’ 9” (Drawing M-990 '33' to '32')
+ 16’ 9” (Drawing M-990 '32' to '311')
+ 2’ 6” (Drawing M-990 '311' to '31')
+ 26’ 0” (Drawing M-990 '31' to '28')
- 1’ 0” (Drawing C-50 '28' to '29')
+ 50’ 0” (Drawing C-51 '29' to '21')
+ 87’ 0” (Drawing C-51 '21' to Containment Centerline)
= 373’ 4” = 113.792 m

$\text{Distance} = [X^2 + Y^2]^{1/2} - R_{cont} = [1.067^2 + 113.782^2]^{1/2} - 18.7452 = 95.05$ m

Intake Elevation Above Grade =

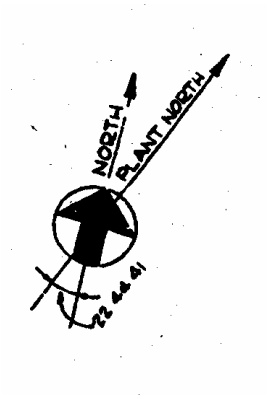
+ 641’ 0.0625” (Drawing M-990 Section "A-A" 14" Pipe Centerline)
- 2’ 0” (Drawing M-990 Elbow to intake distance)
- 590’ 0” (Grade Elevation)
= 49’1/16” = 14.9367875 m

NOTE: elbow center to face distance of about 21” not included reducing the elevation differences

Intake Height: 14.94 m

Receptor to Source Direction:

True North and Plant North are different by: 22°44'41" (Drawing C-2)



α = atan[X/Y] = atan[-1.067 /114.4016] = -0.534° Relative to Plant North
α = -0.534+ 22.75 = 22.216° Relative to True North

Direction to Source = 22.2° +180° = 202.2° Relative to True North

Source Data

Release Height: Assume Containment release elevation is the elevation as the receptor elevation

Release Height = 14.94 m

Containment Surface (Area Source) – Normal Intake Train 'A and B'

Receptor Data:

Location of Normal Intake Train "A":
X (West) =
+ 43' 0" (Drawing C-51 'J' to 'G')
+ 26' 6" (Drawing C-51 'G' to Containment Centerline)
+ 12' 0" (Drawing M-119 Sh. 3 'J' to West side of intake "A")
- 1' 6" (Drawing M-119 Sh. 3 half of intake width (36"))
= 80'0" = 24.384 m

Y (North) =
- 1'0" (Drawing C-50 '28' to '29')
30' 0" (Drawing C-51 '29' to '21')
87' 0" (Drawing C-51 '21' to Containment Centerline)
= 116'0" = 35.357 m

NOTE: Release has to circumvent the SIRWT before if reaches the intake. This will add distance from the containment. However, it is not yet taken into account. NEI 99-03 Appendix D states "For ground releases, it may be appropriate to consider flow around an intervening building if the building is sufficiently tall that it is unrealistic to expect flow from the release point to go over the building." However, the following equation assumes that the release path goes straight through the SIRWT.

Distance = $[X^2+ Y^2]^{1/2}$ - R_{cont} = $[24.384^2 + 35.357^2]^{1/2}$ - 18.7452 = 24.20 m

Intake Elevation Above Grade =

+ 663' 11" (Drawing M-119 Sh. 4 center normal intake duct)
- 590' 0" (Grade Elevation)
= 73'11" = 22.5298 m

Intake Height: 22.53 m

Receptor to Source Direction:

True North and Plant North are different by: 22°44'41" (Drawing C-2)

α = 360 - arctan[X/Y] = 360 - arctan[24.384/35.357] = 325.408° Relative Plant North
α = 325.408° + 22.75 = 348.16° Relative True North

Direction to Source = 348.2° - 180° = 168.2°

Source Data

Release Height: Assume Containment release elevation is the elevation as the receptor elevation

Release Height = 22.53 m

Location of Normal Intake Train "B":
X (West) =
+80'0" Location of Normal Intake Train "A"
- 17'0" (Drawing M-119 Sh. 3 Intake "A" to "B")
= 63'0" = 19.2024 m

Y (North) = (see above)

= 116'0" = 35.357 m

Distance = $[X^2+ Y^2]^{1/2}$ - R_{cont} = $[19.2024^2 + 35.357^2]^{1/2}$ - 18.7452 = 21.49 m

Intake Train "B" Elevation Above Grade is the same as Train "A"

Intake Height: 22.53 m

Receptor to Source Direction:

True North and Plant North are different by: 22°44'41" (Drawing C-2)

α = 360 - arctan[X/Y] = 360 - arctan[19.2024/35.357] = 331.494° Relative Plant North

α = 331.494° + 22.75 = 354.24° Relative True North

Direction to Source = 354.2° - 180° = 174.2°

SIRWT Vent – Emergency Intake

Receptor Data:

Location of Emergency Intake relative to the SIRWT Vent:

X (East) =
+ 28’ 6” (Drawing C-38: SIRWT centerline to 'G')
+ 26’ 6” (Drawing C-51: 'G' to Containment Centerline)
- 3’ 6” Location of Emergency intake to Containment Centerline
= 51’ 6” = 15.697 m

Y (North) =
+ 373’ 4” Location of Emergency intake to Containment Centerline
-25’ 0” (Drawing C-38 SIRWT Centerline to ‘21’)
-87’ 0” (Drawing C-51 '21' to Containment Centerline)
= 261’4” = 79.654 m

Distance = $[X^2+ Y^2]^{1/2}$ = $[15.697^2 + 79.654^2]^{1/2}$ = 81.19 m

Intake Height: 14.94 m

Receptor to Source Direction:

True North and Plant North are different by: 22.75° (Drawing C-2)
α = arctan[X/Y] = arctan[15.697/79.654] = 11.148° Relative Plant North
α = 11.148° + 22.75 = 33.90° Relative True North

Direction to Source = 33.90° +180° = 213.9

Source Data

Release Type: Ground

Release Elevation Above Grade =
+ 644’ (Drawing C-38 Roof under the SIRWT)
+ 24’ (Drawing C-38 SIRWT Height)
+ 1’ 11” (Drawing 950X13*C18 Sh 67 roof slope * SIRWT OD/2)
+0’ 6” (Drawing 950X13*C18 Sh 55 roof vent height)
– 590’ (Grade Elevation)
= 80’ 5” = 24.511 m

Release Height = 24.51 m

SIRWT Vent – Normal Intake Train 'A' and 'B'

Receptor Data:

Location of Normal Intake Train 'A' relative to the SIRWT Vent:

X (West) =
+ 41' 0" (Drawing C-38: SIRWT Centerline to 'M')
- 26' 6" (Drawing M-119 Sh. 3: 'M' to 'J')
+ 12' 0" (Drawing M-119 Sh. 3: 'J' to West side of intake duct 'A')
- 1' 6" = (Drawing M-119 Sh. 3: 36"/2 half the width of intake duct)
= 25' = 7.62 m

Y (North) =
-25' 0" (Drawing C-38 SIWRT Centerline to '21')
+50' 0" (Drawing C-51'21' to '29')
-1' 0" (Drawing C-50 '29' to '28' see Drawing M119 Sh4)
= 24' 0" = 7.315 m

Distance = $[X^2+ Y^2]^{1/2}$ = $[7.62^2 + 7.315^2]^{1/2}$ = 10.56 m

Intake Height: 22.53 m

Source to Receptor Direction:

α = 360 - arctan[X/Y] = 360 - arctan[7.62/7.315] = 313.83° Relative Plant North
α = 313.83° + 22.75 = 365.58° Relative True North

Direction to Source = 365.58° -180° = 156.6°

Source Data

Release Type: Ground

Release Elevation Above Grade =
+ 644' (Drawing C-38 Roof under the SIRWT)
+ 24' (Drawing C-38 SIRWT Height)
+ 1' 11" (Drawing 950X13*C18 Sh 67 roof slope * SIRWT OD/2)
+0' 6" (Drawing 950X13*C18 Sh 55 roof vent height)
– 590' (Grade Elevation)
= 80' 5" = 24.511 m

Release Height = 24.51 m

Location of Normal Intake Train "B" relative to the SIRWT Vent:

X (West) =
+ 25' 0" Location of Train "A" relative to the SIRWT

- 17’ 0” (Drawing M-119 Sh. 3: Intake “A” to “B”)
= 8’ = 2.438 m

Y (North) = Same as Train “A”

= 24’ 0” = 7.315 m

Distance = $[X^2+ Y^2]^{1/2}$ = $[2.438^2 + 7.315^2]^{1/2}$ = 7.71 m

Intake Height: 22.53 m

Source to Receptor Direction:

α = 360 - arctan[X/Y] = 360 - arctan[2.438/7.315] = 341.56° Relative Plant North
α = 341.56° - 360° + 22.75° = 4.31° Relative True North

Direction to Source = 4.3° + 180° = 184.3°

Stack Release – Emergency Intake

Receptor Data:

Location of Emergency Intake relative to the Stack

X (East) =
-3’ 6” Location of Emergency Intake to Containment Centerline
+ 39’ 8” (Drawing C-141: Distance between stack base and Containment centerline)
- 0’ 9 1/16” (Drawing C-141: Distance between stack top stack base)
= 36’ 8 15/16” = 10.793 m

Y (North) =
+ 373’ 4” Location of Emergency Intake to Containment Centerline
- 61’ 3” (Drawing C-141 Stack Base to Containment Centerline)
+ 5’ 8 1/8” (Drawing C-141: Stack top to Stack base distance)
= 317’ 9 1/8” = 96.853 m

Distance = $[X^2+ Y^2]^{1/2} = [10.793^2 + 96.853^2]^{1/2} =$ 97.45 m

Intake Height: 14.94 m

Source to Receptor Direction:
$\alpha = \text{atan}[X/Y] = \text{atan}[10.793/96.853] = 6.359°$ Relative to Plant North
$\alpha = 6.359 + 22.75 = 29.11°$ Relative to True North

Direction to Source = 29.11 + 180 = 209.1°

Source Data

Release Type: Ground

Above Grade Elevation =
+ 782’ 0” (Drawing C-141 Stack Height)
- 590’ 0” (Grade Elevation)
= 192’ 0” = 58.5216 m

Release Height = 58.52 m

Stack Release – Normal Intake Train ‘A’ and ‘B’

Receptor Data:

Location of Normal Intake ‘A’ relative to the Stack

X (West) =
+80’ 0” Location of Normal Intake ‘A’ to Containment Centerline
- 39’ 8” (Drawing C-141: Distance from Stack Bottom CL to Containment CL)
+ 0’ 9 1/16” (Drawing C-141: Distance from Stack Bottom CL to Stack Top CL)
= 41’ 1 1/16” = 12.524 m

Y (North) =
+116’ 0” Location of Normal Intake ‘A’ to Containment Centerline
- 61’ 3” (Drawing C-141: Stack Bottom CL to Containment CL)
+ 5’ 8 1/8” (Drawing C-141: Stack Top CL to Stack Bottom CL)
= 60’ 5 1/8” = 18.418 m

Distance = $[X^2+ Y^2]^{1/2} = [12.524^2 + 18.418^2]^{1/2} =$ 22.27 m

Intake Height: 22.53 m

Source to Receptor Direction: 325.785
$\alpha = 360 - \arctan[X/Y] = 360 - \arctan[12.524/18.418] = 325.785°$ Relative Plant North
$\alpha = 325.785° - 360 + 22.75 = -11.465 + 360 = 348.535°$ Relative True North

Direction to Source = 348.535° - 180 = 168.5

Source Data

Release Height = 58.5216 m

Location of Normal Intake Train ‘B’ relative to the Stack:

X (West) =
+ 41’ 1 1/16” Location of Normal Intake Train “A” relative to the Stack
- 17’ 0” (Drawing M-119 Sh. 3: Intake “A” to “B”)
= 24’ 1 1/16’ = 7.342 m

Y (North) = Same as Train “A”

= 60’ 5 1/8” = 18.418 m

Distance = $[X^2+ Y^2]^{1/2} = [7.342^2 + 18.418^2]^{1/2} =$ 19.83 m

Intake Height: 22.53 m

Source to Receptor Direction:

$\alpha = 360 - \arctan[X/Y] = 360 - \arctan[7.342/18.418] = 338..266°$ Relative Plant North
$\alpha = 358.520° - 360° + 22.75° = 1.02°$ Relative True North

Direction to Source = 1.02° + 180° = 181.0°

Email from Gary Pratt (Palisades) to Joe Sinodis (NAI), "RE: Remaining X/Qs," with attachment, June 29, 2004

Subject: RE: Remaining X/Qs
Date: Tue, 29 Jun 2004 07:42:54 -0400
From: "Pratt, Gary F." <GARY.PRATT@nmcco.com>
To: "Joe Sinodis" <joe.sinodis@numerical.com>, "Voskuil, Jeffrey L." <JEFFREY.VOSKUIL@nmcco.com>
CC: "Brogan, Brian A." <BRIAN.BROGAN@nmcco.com>, <Jim.Harrell@numerical.com>

Joe

Attached WORD file contains the X/Q input data for the SSRVs and the ADVs. The input data has been reviewed by Jeff and can be used by NAI for the Palisades dose analysis.

Gary

-----Original Message-----
From: Joe Sinodis [mailto:joe.sinodis@numerical.com]
Sent: Thursday, June 24, 2004 11:01 AM
To: Pratt, Gary F.; Voskuil, Jeffrey L.
Cc: Brogan, Brian A.; Jim.Harrell@numerical.com
Subject: Remaining X/Qs

Thanks for sending the approved X/Qs for the LOCA event. We are using them to support the presentation that Jim is preparing.

However, we need the remaining approved X/Q inputs so that we can approve the X/Q calculation. Like the source term calculation, the X/Q calculation needs to be approved before any event calculation can be approved. The following is a list of the other release points for which the input information needs to be approved.

Closest ADV
Closest SSRV
Containment Equipment Door
Extended SIRWT release location *see note below

* I spent an hour or so yesterday pulling the distances and directions off of drawings and ran some preliminary cases to investigate the X/Qs that would result from moving the SIRWT release location (e.g. attaching a hose to the vent and running it away from the intakes). I looked at two cases that would give much more favorable results for SIRWT releases. One is running the hose from the SIRWT vent to the S end of the turbine building (line 1 on dwg. C-46) lined up with the 'B' normal intake. The other location is the SE corner of the auxiliary building (intersection of lines 21 and A on dwg. C-51). The hose end is assumed to be dropped to a height of about 10' above grade for these cases.

The ADV and SSRV cases will be needed in the CRE event calculation which is scheduled to be approved along with the LOCA calculation. For now

approval of the draft distances and direction previously sent is all that's needed for these release points for the X/Q calculation. Any reduction credit for plume rise is taken into account in the individual event calculations, not the X/Q calculation. The release rates from the ADVs and SSRVs may only be needed if secondary release results need to be improved. The release rates tie to the cooldown rate being assumed (and the NRC will ask about consideration of the cooldown rate in determination of the exit velocity).

I have developed draft handwritten inputs for the containment equipment door release. They are what I faxed to Gary on Monday June 21. They provide better results than simply the closest containment point, and may need to be used if the diffuse release from containment is not implemented. As such, it would be prudent to go ahead and have them approved so the cases may be run in the X/Q calculation.

I can provide the hand-written distance and direction determinations for the potential SIRWT locations if you desire for them to be used in the project. Of course they would need to be approved along with the others to go in the X/Q calculation.

Please let me know if you have any questions and how you wish to proceed.

Thanks,
Joe

--
Joe Sinodis
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Cary, NC 27511

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Release/Receptor Combination Table

Release Point	Receptor Point	Release Height (ft)	Release Height (m)	Receptor Height (ft)	Receptor Height (m)	Distance (ft)	Distance (m)	Direction with respect to true North	Reference
SSRV (East Bank)	Normal Control Room Intake "A"		17.37		22.53		17.65	186.7	See below
SSRV (West Bank)	Normal Control Room Intake "B"		17.37		22.53		16.96	203.8	See below
SSRV (East Bank)	Emergency Control Room Intake		17.37		14.94		96.78	212.5	See below
ADV	Normal Control Room Intake "A"		17.37		22.53		20.08	191.9	See below
ADV	Normal Control Room Intake "B"		17.37		22.53		19.78	206.9	See below
ADV	Emergency Control Room Intake		17.37		14.94		100.39	214.0	See below

SSRV Release – Emergency Intake

Receptor Data:

Location of Emergency Intake relative to the SSRV

X (East) =

-3’ 6”	(Drawing M-40: Distance SSRV (East Bank) to J)
-3’ 6”	(Drawing M-40)
-5’ 6”	(Drawing M-40)
-26’ 6”	(Drawing C-51: J to M)
96’ 0”	(Drawing C-51: M to Containment Centerline)
57’ 0”	SSRV (East Bank) to Containment Centerline
-3’ 6”	Location Containment Centerline to Emergency Intake

= 53’ 6” = 16.307 m

Y (North) =

7’ 7 11/16”	(Drawing M-40: SSRV to 20)
20’ 0”	(Drawing M-40) 20-22
-88’ 0”	(Drawing M-29: 22 to Containment Centerline)
-60’ 4 5/16”	SSRV to Containment Centerline
+ 373’ 4”	Location of Containment Centerline to Emergency Intake

= 312’ 11/16” = 95.394 m

Distance = $[X^2+ Y^2]^{1/2} = [16.307^{\ 2} + 95.394^{\ 2}]^{1/2} =$ 96.78 m

Intake Height: 14.94 m

Source to Receptor Direction:
α = atan[X/Y] = atan[16.307/95.394] = 9.701° Relative to Plant North
α = 9.701° + 22.75° = 32.45° Relative to True North

Direction to Source = 32.45° + 180° = 212.5°

Source Data

Release Type:

Above Grade Elevation =

+ 639’ 0”	(Drawing M-40 Roof Elevation)
+ 8’ 0”	(Drawing M-40 Stack Height)
- 590’ 0”	(Grade Elevation)

= 57’ 0” = 17.37 m

Release Height = 17.37 m

Secondary Safety Relief Valve Discharge Stack Velocity (TBD Later)

1000 psia	FSAR Table 4-5, Rev 21 Design Pressure

550 °F	FSAR Table 4-5, Rev 21 Design Temperature
486,600 lb/hr	FSAR Table 4-5, Rev 21 Capacity, Minimum per valve
1000 psia	FSAR Table 4-5, Rev 21 Set Pressure-lowst nominal value
± 3%	FSAR Table 4-5, Rev 21 Set Point Tolerance – as found
12”	Drawing M-79 Discharge Stack Diameter (NEW)

SSRV Release – Normal Intake Train 'A' and 'B'

Receptor Data:

Location of Normal Intake 'A' relative to the SSRV

X (East) =
+80' 0" Location of Normal Intake 'A' to Containment Centerline
- 57' 0" SSRV (East Bank) to Containment Centerline
= 16' 0" = 4.877 m

Y (North) =
+116' 0" Location of Normal Intake 'A' to Containment Centerline
- 60' 4 5/16" Location SSRV to Containment Centerline
= 55' 7 11/16" = 16.959 m

Distance = $[X^2+ Y^2]^{1/2} = [4.877^2 + 16.959^2]^{1/2} =$ 17.65 m

Intake Height: 22.53 m

Source to Receptor Direction:
$\alpha = 360 - \arctan[X/Y] = 360 - \arctan[4.877/16.959] = 343.96°$ Relative Plant North
$\alpha = 343.96° - 360° + 22.75° = 6.71°$ Relative True North

Direction to Source = 6.71° + 180° = 186.7°

Source Data

Release Height = 17.37 m

Location of Normal Intake Train 'B' relative to the SSRV:

X (East) =
-80' 0" Location of Normal Intake Train "A" relative to Containment Centerline
+17' 0" (Drawing M-119 Sh. 3: Intake "A" to "B")
+57' Location of SSRV (East Bank) to Containment Centerline
+ 7' East Bank to West Bank (M-65 R13)
= 1 0" = 0.3084m

Y (North) = Same as Train "A"

= 55' 7 11/16" = 16.959 m

Distance = $[X^2+ Y^2]^{1/2} = [.3084^2 + 16.959]^{1/2} =$ 16.96 m

Intake Height: 22.53 m

Source to Receptor Direction:

α = arctan[X/Y] = arctan[.3084/16.96] = 1.042° Relative Plant North
α = 1.042°+ 22.75° = 23.79° Relative True North

Direction to Source = 23.79° + 180° = 203.8°

ADV Release – Emergency Intake

Receptor Data:

Location of Emergency Intake relative to the ADV

X (East) =

57’ 0”	SSRV (East Bank) to Containment Centerline
10’ 8”	(Drawing M-42 Section MM scaled distance ADV to SSRV (East Bank)
-3’ 6”	Location Containment Centerline to Emergency Intake
= 64’ 2” = 19.558 m	

Y (North) =

-60’ 4 5/16”	SSRV to Containment Centerline
+10’ 1”	(Drawing M-40 scaled distance ADV to SSRV)
+ 373’ 4”	Location of Containment Centerline to Emergency Intake
= 323’ 11/16” = 98.468 m	

Distance = $[X^2+ Y^2]^{1/2} = [19.558^{\ 2} + 98.468^2]^{1/2} =$ 100.39 m

Intake Height: 14.94 m

Source to Receptor Direction:
α = atan[X/Y] = atan[19.558/98.468] = 11.234° Relative to Plant North
α = 11.234° + 22.75° = 33.98° Relative to True North

Direction to Source = 33.98° + 180° = 214.0°

Source Data

Release Type:

Above Grade Elevation =

+ 639’ 0”	(Drawing M-40 Roof Elevation)
+ 8’ 0”	(Drawing M-40 Stack Height)
- 590’ 0”	(Grade Elevation)
= 57’ 0” = 17.37 m	

Release Height = 17.37 m

Atmospheric Dump Valve Discharge Stack Velocity (TBD Later)

1000 psia	FSAR Table 4-5, Rev 21 Design Pressure
550 °F	FSAR Table 4-5, Rev 21 Design Temperature
486,600 lb/hr	FSAR Table 4-5, Rev 21 Capacity, Minimum per valve
1000 psia	FSAR Table 4-5, Rev 21 Set Pressure-lowst nominal value
± 3%	FSAR Table 4-5, Rev 21 Set Point Tolerance – as found

12”	Drawing M-79 Discharge Stack Diameter (NEW)

ADV Release – Normal Intake Train 'A' and 'B'

Receptor Data:

Location of Normal Intake 'A' relative to the ADV

X (West) =
+ 80' 0" Location of Normal Intake 'A' to Containment Centerline
- 57' 0" Containment Centerline to SSRV (East Bank)
-10' 8" (Drawing M-42 Section MM scaled distance SSRV (East Bank) to ADV
= 12' 4" = 3.759 m

Y (North) =
+10' 1" (Drawing M-40 scaled distance ADV to SSRV)
- 60' 4 5/16" Location SSRV to Containment Centerline
+116 0" Location of Containment Centerline to Normal Intake 'A'
= 64 8 11/16" = 19.728 m

Distance = $[X^2+ Y^2]^{1/2} = [3.759^2 + 19.728^2]^{1/2} =$ 20.08 m

Intake Height: 22.53 m

Source to Receptor Direction:
$\alpha = 360 - \arctan[X/Y] = 360 - \arctan[3.759/19.728] = 349.13°$ Relative Plant North
$\alpha = 349.13° - 360° + 22.75° = 11.88°$ Relative True North

Direction to Source = 11.88° + 180° = 191.9°

Source Data

Release Height = 17.37 m

Location of Normal Intake Train 'B' relative to the ADV:

X (East) =
- 12' 4" Location of Normal Intake Train "A" relative to ADV
+ 17' 0" (Drawing M-119 Sh. 3: Intake "A" to "B")
= 4' 8" = 1.422 m

Y (North) = Same as Train "A"

= 64 8 11/16" = 19.728 m

Distance = $[X^2 + Y^2]^{1/2}$ = $[1.422^2 + 19.728^2]^{1/2}$ = 19.78m

Intake Height: 22.53 m

Source to Receptor Direction:

α = arctan[X/Y] = arctan[1.422/19.728] = 4.123° Relative Plant North
α = 4.123°+ 22.75° = 26.87° Relative True North

Direction to Source = 26.87° + 180° = 206.9°

Email from Gary Pratt (Palisades) to Joe Sinodis (NAI), "Re: Fax," with attachment, June 28, 2004

Subject: RE: fax
Date: Mon, 28 Jun 2004 13:24:38 -0400
From: "Pratt, Gary F." <GARY.PRATT@nmcco.com>
To: "Joe Sinodis" <joe.sinodis@numerical.com>
CC: "Voskuil, Jeffrey L." <JEFFREY.VOSKUIL@nmcco.com>, "Brogan, Brian A." <BRIAN.BROGAN@nmcco.com>

Joe

The distance from Containment Centerline was changed from 117' to 116' (see 6/23 email).

distance to "A" = 26.84' (see attached PDF file)
"B" = 23.06'

Gary

-----Original Message-----
From: Joe Sinodis [mailto:joe.sinodis@numerical.com]
Sent: Monday, June 21, 2004 11:43 AM
To: Pratt, Gary F.
Cc: Voskuil, Jeffrey L.; Brogan, Brian A.; Jim.Harrell@numerical.com
Subject: fax

Gary,

I just sent you a fax with X/Q input information for a release from the containment equipment hatch for the LOCA event to be included in the approved X/Q inputs.

Joe

--
Joe Sinodis
Numerical Applications, Inc.
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JUN-21-2004 10:26A FROM: TO:12697642060 P:2/2
X/O from Equipment Hatch 6/17/04

Dwg. M-140 Rev. 7 Other dims from approved cont. rel. pt. docs.
Assume release pt. is center of equipment door opening

Rel. el. = 657'
Rel. ht. = 657' − 590' = 67' × 0.3048 m/Ft = 20.42 m

r = 61.5

Penetration is @ Az. = 349° on containment surface.
(x, y) of rel. pt. if (0, 0) is cont. center pt.

$x = r \sin\beta = 61.5 \sin 11°$
$x = 11.735'$

$y = r \cos\beta = 61.5 \cos 11°$
$y = 60.370'$

β = 360 − 349° = 11

Emergency Intake
(x, y) = (3.5', 373'-4")

$d = \sqrt{312.963^2 + 8.235^2}$
$d = 313.071 \text{ Ft} \times \frac{0.3048 \text{ m}}{\text{Ft}}$
$d = 95.42 \text{ m}$

3.5', 373'-4"
373'-4" − 60.370' = 312.963
11.735', 60.370'
11.735 − 3.5 = 8.235'

$\alpha = \tan^{-1} \frac{312.963}{8.235}$
$\alpha = 88.493°$

$\phi = 90 - 88.493 = 1.507$
+22.75
+180
204.3

Dir. = 270 − 88.493 = 181.507° w/rt to N
DIR = 181.507° + 22.75° = 204°

Normal Intake "A"
(x, y) = 80', 117'

$d = \sqrt{68.265^2 + 56.63^2}$ 55.63
$d = 88.636' \times 0.3048 \frac{\text{m}}{\text{Ft}}$
$d = 27.03 \text{ m}$
26.84

(80, 117)
68.265' = 80 − 11.735
56.63
(11.735, 60.370)

$\alpha = \tan^{-1} \frac{56.63}{68.265} = 39.677°$
Dir. = 90 + α = 129.677° w/rt to N
DIR = 129.677° + 22.75 = 152° (151.9)

Normal Intake "B"
(x, y) = 63', 117'
116'
51.265
63 − 11.735
56.63

$d = \sqrt{51.265^2 + 56.63^2}$
$d = 76.388' \times 0.3048$
$d = 23.28 \text{ m}$
23.06

$\alpha = \tan^{-1} \frac{56.63}{51.265} = 47.847$
Dir. = 90 + α = 137.847°
DIR = 137.847° + 22.75 = 160.60
DIR = 161
161.1

Email from Gary Pratt (Palisades) to Jim Harrell (NAI), "ARCON96 data," with attachment, March 3, 2004

Subject: ARCON96 data
Date: Wed, 3 Mar 2004 16:21:54 -0500
From: Pratt, Gary F. <GARY.PRATT@nmcco.com>
To: Jim Harrell (E-mail) <Jim.Harrell@numerical.com>

Jim

The attached file contains the five years of Palisades metrological data in ARCON96 input format. I have not completed my review of conversion of the data file we received from Dennis F. Kahlbaum, Senior Meteorologist, AIR, Inc to the ARCON96 required input format. I have performed sufficient reviews to believe that the conversion was done correctly. Let me know if ARCON96 has any problems reading these files.

Gary

<<Palisades ARCON96.zip>>

The .zip file attachment includes a .txt file for each year from 1999 to 2003 of the hourly meteorological data. These are too large to present in hard copy format in this calculation. The files are provided on the compact disk that accompanies this calculation, and are listed in Attachment C.

Email from Gary Pratt (Palisades) to Joe Sinodis (NAI), "MSLB X/Q Data," with attachment, September 14, 2004

Subject: MSLB X/Q Data
Date: Tue, 14 Sep 2004 08:18:19 -0400
From: Pratt, Gary F. <GARY.PRATT@nmcco.com>
To: Joe Sinodis (E-mail) <joe.sinodis@numerical.com>
CC: Voskuil, Jeffrey L. <JEFFREY.VOSKUIL@nmcco.com>

Joe

I have completed my review of the X/Q input data for MSLB outside of the Containment that you sent to me on September 9, 2004 as shown in the attached PDF file. The current Palisades drawings were used and the calculations are consistent with previous X/Q input data developed and reviewed here at Palisades.

Gary

<<MSLB XQ data.pdf>>

SEP-9-2004 11:08A FROM: [redacted] TO:12697642428 P:2/4 9/8/04

Emergency Ensuite
X = 3'-6" W ✓
Y = 373'-4" N ✓
El. = 49'-½" above grade ✓

Normal Ensuite A
X = 80' W ✓
Y = 116' N ✓
El. = 73'-11" above grade ✓

Normal Ensuite B
X = 63' W ✓
Y = 116' N ✓
El. = 73'-11" above grade ✓

from [redacted] Att. 2

*-all in relation to containment centerlines

NE roof vent
[redacted] Dwg. M-113 R11
$4\frac{19}{32}$" = 35' ~ Line M ~ turbine ℄ ✓
vent is $\frac{18}{32}$" E of line 5
$\frac{18"}{32} * \frac{35'}{4\frac{19}{32}"} = 4.565'$ E of line 5 ✓
X = 96' + 22' + 22' - 4.565
(4 to (M) Dwg. C-50R20) ((M) to (5) Dwg. C-47R9) ((5) to vent)
X = 135.435' ✓

Dwg. M-113 R11 & C-50R20 ✓
$2\frac{14}{32}$" [redacted] = 20' ~ line 22 ~ 20
vent is $1\frac{14}{32}$" S of line 22 Dwg. M-113 ✓
$1\frac{14}{32}" * \frac{20'}{2\frac{14}{32}"} = 11.795'$ S of line 22 ✓
Y = 87' + 1' - 11.795
(4 to (22) Dwg. C-50R20) ((22) to vent)
Y = 76.205 ✓

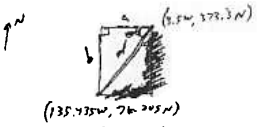
NW roof vent
vent is $\frac{20}{32}$" W of line 5
$\frac{20"}{32} * \frac{35'}{4\frac{19}{32}"} = 5.072$ W of line 5 ✓
X = 96' + 22' + 22' + 5.072
X = 145.072 ✓

vent is $\frac{21}{32}$" S of line 22 ✓
$\frac{21"}{32} * \frac{20'}{2\frac{14}{32}"} = 5.385'$ S of line 22 ✓
Y = 87' + 1' - 5.385'
Y = 82.615' ✓

El. = 680' --> Dwg. M-15 R9 gives the structure map el. = 682'-9" - based on the dwg. the ceiling is taken to be 680' ✓
Rel. Lt. = 680' - 590' (plant grade) = 90' * 0.3048 m/ft = 27.432 m
Rel. Lt. = 27.43 m ✓

SEP-9-2004 11:09A FROM: TO:12697642428 P:3/4

NE vent to Em. Intake



$a = 135.435' - 3.5'$ ✓ $b = 373.333' - 76.205$ ✓

$a = 131.935$ ✓ $b = 297.128'$ ✓

$d = \sqrt{a^2 + b^2} = \sqrt{131.935^2 + 297.128^2}$

$d = 325.103' * \frac{0.3048\,m}{ft}$

$dist = 99.09\,m$ ✓

plant N ~ 22.75° ↳ from Att. D

$\alpha = \tan^{-1}\frac{b}{a} = \tan^{-1}\frac{297.85}{131.935}$

$\alpha = 66.057°$ ✓

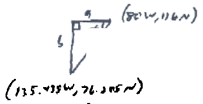
$Dir = 270 - \alpha = 270 - 66.057$

$Dir = 203.943°$ w/r/t plant N ✓

$DIR = 203.943 + 22.75 = 226.693°$

$DIR = 227°$ ✓

NE vent to Intake A



$a = 135.435' - 80'$ ✓ $b = 116' - 76.205'$ ✓

$a = 55.435'$ ✓ $b = 39.795'$ ✓

$d = \sqrt{a^2 + b^2} = \sqrt{55.435^2 + 39.795^2}$

$d = 68.246' * \frac{0.3048\,m}{ft}$

$dist = 20.79\,m$ (20.80)

$\alpha = \tan^{-1}\frac{39.795}{55.435} = 35.673°$ ✓

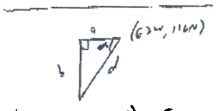
$Dir = 270 - \alpha = 270 - 35.673$

$Dir = 234.327$ w/r/t plant N ✓

$DIR = 234.327 + 22.75 = 257.077°$

$DIR = 257°$ ✓

NE vent to Intake B



$a = 135.435' - 63'$ $b = 116' - 76.205$

$a = 72.435$ ✓ $b = 39.795'$ ✓

$d = \sqrt{72.435^2 + 39.795^2}$

$d = 82.647' * \frac{0.3048\,m}{ft}$

$dist = 25.19\,m$ ✓

$\alpha = \cos^{-1}\frac{39.795}{72.435} = 28.784°$ ✓

$Dir = 270 - 28.784° = 241.216$ w/r/t plant N

$DIR = 241.216 + 22.75 = 263.966°$

$DIR = 264°$ ✓

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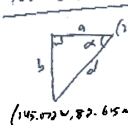
NW vent to Fire. Intake



(145.072W, 82.615N)

a = 145.072' - 7.5' ✓ b = 373.333' - 82.615' ✓

a = 141.572' ✓ b = 290.718' ✓

$d = \sqrt{141.572^2 + 290.718^2}$

$d = 323.352' * \frac{0.3048m}{ft}$

dist = 98.55m ✓

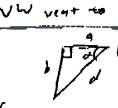
$\alpha = \tan^{-1} \frac{290.718}{141.572} = 64.035°$ ✓

Dir = 270 - 64.035 = 205.965° w/r/t plant N

DIR = 205.965 + 22.75 = 228.715° ✓

DIR = 229° ✓

NW vent to Intake A



(145.072W, 82.615N)

a = 145.072' - 80' ✓ b = 116' - 82.615' ✓

a = 65.072' ✓ b = 33.385' ✓

$d = \sqrt{65.072^2 + 33.385^2}$

$d = 73.136' * \frac{0.3048m}{ft}$

dist = 22.29m ✓

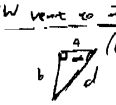
$\alpha = \tan^{-1} \frac{33.385}{65.072} = 27.160$ ✓

Dir = 270 - 27.160 = 242.840 w/r/t plant N

DIR = 242.840 + 22.75 = 265.590° ✓

DIR = 266 ✓

NW vent to Intake B



(145.072W, 82.615N)

a = 145.072' - 63' ✓ b = 116' - 82.615' ✓

a = 82.072' ✓ b = 33.385'

$d = \sqrt{82.072^2 + 33.385^2}$

$d = 88.602' * \frac{0.3048m}{ft}$

dist = 27.00m ✓

$\alpha = \tan^{-1} \frac{33.385}{82.072} = 22.135°$ ✓

Dir = 270 - 22.135 = 247.865° w/r/t plant N

DIR = 247.865 + 22.75 = 270.615° ✓

DIR = 271° ✓

Reviewed by
Tony Pratt
NYC - Palisades
9/14/04