



Tennessee Valley Authority, 1101 Market Street, LP 5A, Chattanooga, Tennessee 37402-2801

August 13, 2008

10 CFR 52.79

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D.C. 20555

In the Matter of)
Tennessee Valley Authority)

Docket No. 52-014 and 52-015

**BELLEVILLE COMBINED LICENSE APPLICATION – RESPONSE TO REQUEST FOR
ADDITIONAL INFORMATION – LONG-TERM ATMOSPHERIC DISPERSION ESTIMATES**

Reference: Letter from Joseph M. Sebrosky (NRC) to Andrea L. Sterdis (TVA), Request for
Additional Information Letter No. 076 Related to SRP Section 2.3.5 for the
Belleville Units 3 and 4 Combined License Application, dated July 16, 2008

This letter provides the Tennessee Valley Authority's (TVA) response to the Nuclear Regulatory
Commission's (NRC) request for additional information (RAI) items included in the reference
letter.

A response to each NRC request in the subject letter is addressed in the enclosure which also
identifies any associated changes that will be made in a future revision of the BLN application.

If you should have any questions, please contact Thomas Spink at 1101 Market Street, LP5A,
Chattanooga, Tennessee 37402-2801, by telephone at (423) 751-7062, or via email at
tespink@tva.gov.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on this 13th day of Aug, 2008.

Andrea L. Sterdis
Manager, New Nuclear Licensing and Industry Affairs
Nuclear Generation Development & Construction

Enclosure
cc: See Page 2

DOSS
NRC

Document Control Desk

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cc: (Enclosures)

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Enclosure
TVA Letter Dated: August 13, 2008
RAI Responses

Responses to NRC Request for Additional Information letter No. 076 dated July 16, 2008.
(5 pages, including this list)

Subject: Long-Term Atmospheric Dispersion Estimates for Routine Releases in the Final Safety Analysis Report

<u>RAI Number</u>	<u>Date of TVA Response</u>
02.03.05-01	This letter – see following pages
02.03.05-02	This letter – see following pages

<u>Associated Additional Attachments / Enclosures</u>	<u>Pages Included</u>
Attachment 02.03.05-02A	22 (including cover)

Enclosure
TVA Letter Dated: August 13, 2008
RAI Responses

NRC Letter Dated: July 16, 2008

NRC Review of Final Safety Analysis Report

NRC RAI NUMBER: 02.03.05-01

Please discuss how each of the four types of χ/Q values provided in FSAR Tables 2.3-323 through 2.3-329 (i.e., no decay, undepleted; no decay, depleted; 2.26 day decay, undepleted; 8.00 day decay, depleted) are used to calculate the dose rates to individuals and the population as presented in FSAR Section 11.3.3.

BLN RAI ID: 0721

BLN RESPONSE:

The guidance of Regulatory Guide 1.111 and the XOQDOQ computer code (NUREG/CR-2919) were used to determine atmospheric dispersion (χ/Q) and atmospheric deposition (D/Q) values needed for evaluation of maximum individual and population exposure to normal gaseous effluents. Consistent with Regulatory Guide 1.111 guidance for radiological impact evaluations, the removal mechanisms of radioactive decay and deposition were considered. The resulting χ/Q values address three conditions of radioactive decay and plume depletion: no decay, undepleted; 2.26 day decay, undepleted; and 8.00 day decay, depleted. These conditions, as well as the case of no decay, depleted, are provided in FSAR Tables 2.3-323 through 2.3-329.

The guidance of Regulatory Guide 1.109 and the GASPARI computer code (NUREG/CR-4653) were used to evaluate maximum individual and population exposure to normal gaseous effluents. Meteorological data can be provided to GASPARI through an alternate input file; therefore, an additional meteorological data file was generated for use with GASPARI. The file generated included three conditions of radiological decay and plume depletion. These conditions included: no decay, undepleted; 2.26 day decay, undepleted; and 8.00 day decay, depleted.

Per the GASPARI – Technical Reference and User Guide, GASPARI uses the first condition (no decay, undepleted) for tritium, ^{14}C , and other long-lived radionuclides that are nondepositing. The second condition (2.26 day decay, undepleted) is used for short-lived radioiodine for inhalation doses and for noble gases for external exposure to the plume. The third condition (8.00 day decay, depleted) is used for the radionuclides other than tritium, ^{14}C , and noble gases for evaluation of inhalation doses.

This response is PLANT-SPECIFIC.

ASSOCIATED BLN COL APPLICATION REVISIONS:

No COLA revisions have been identified associated with this response.

ATTACHMENTS:

None.

Enclosure
TVA Letter Dated: August 13, 2008
RAI Responses

NRC Letter Dated: July 16, 2008

NRC Review of Final Safety Analysis Report

NRC RAI NUMBER: 02.03.05-02

BLN FSAR Section 11.3.3.4 states that, based on site meteorological conditions, the highest rate of plume exposure and ground deposition occurs at the EAB 0.77 miles NNE of the plant. BLN FSAR Table 2.3-325 lists the no decay undepleted χ/Q value at this location as $1.40 \text{ E-}06 \text{ m/sec}^3$. However, Table 2.3-323 lists higher no decay, undepleted χ/Q values at 1.5 mi. SSE and 2 mi. S of the plant as $2.11 \text{ E-}06 \text{ m/sec}^3$ and $2.06 \text{ E-}06 \text{ m/sec}^3$, respectively. The no decay, depleted χ/Q values at these two locations shown in Table 2.3-325 are also higher than the no decay, depleted χ/Q value listed for the EAB in the NNE sector at 0.77 miles. Therefore, please justify use of the 0.77 mile NNE EAB χ/Q values to determine the highest rate of plume exposure.

BLN RAI ID: 0722

BLN RESPONSE:

Since submittal of Revision 0 of the FSAR, long term atmospheric dispersion factors and normal gaseous effluent doses have been recalculated. The new calculations were prompted by an updated land use census; however, changes other than those associated with receptor locations were also made. Affected FSAR Section 2.3 text and tables are provided as FSAR changes that will be made in a future revision of the COLA. Affected Section 11.3 revised text and tables were provided in the response to NRC RAI 11.03-01 (BLN-RAI-LTR-033 response dated August 1, 2008).

The locations of higher atmospheric dispersion (χ/Q) values beyond the EAB, noted in RAI 11.03-01, are also present in the revised atmospheric dispersion analysis. This effect results from the use of a mixed-mode release with adjustments for recirculation and effective stack height. These adjustments include XOQDOQ default open terrain correction factors and site specific terrain features, respectively. The revised atmospheric dispersion analysis showed that peak concentrations occur within three miles of the plant in the ENE, E, ESE, SE, SSE, and S sectors. The revised gaseous effluent dose analysis used the χ/Q value for the maximum peak location at 1.74 miles S of the plant, $2.8 \text{ E-}06 \text{ sec/m}^3$, to evaluate the doses due to immersion in the plume. Use of this value is consistent with the objectives of 10 CFR 50 Appendix I which require evaluation of annual external dose from gaseous effluents to any individual in an unrestricted area. It is also consistent with the guidance of Regulatory Guide 1.109, which defines the point of evaluation of external dose from gaseous effluents as the location of the highest dose offsite.

This response is PLANT-SPECIFIC.

ASSOCIATED BLN COL APPLICATION REVISIONS:

1. COLA Part 2, FSAR, Chapter 2, Section 2.0, Table 2.0-201, sheet 5 of 5, row 3, will be revised from:

Site Boundary (annual average)	$\leq 2.0 \times 10^{-5} \text{ sec/m}^3$	$0.14 \times 10^{-5} \text{ sec/m}^3$	Table 2.3.325	Yes
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To read:

Site Boundary (annual average)	$\leq 2.0 \times 10^{-5} \text{ sec/m}^3$	$0.28 \times 10^{-5} \text{ sec/m}^3$	Table 2.3.328	Yes
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2. COLA Part 2, FSAR, Chapter 2, Subsection 2.3.5.1, fourth paragraph will be revised from:

In general, in order for an elevated release to be assumed, either the release height must be at least twice the height of adjacent buildings or detailed information must be known about the wind speed at the height of the release. For this analysis, the routine releases were conservatively modeled as ground level releases.

To read:

For this analysis, the routine releases were modeled as mixed-mode releases; that is, the plume is considered as a ground level release part of the time and as an elevated release the remainder of the time.

3. COLA Part 2, FSAR, Chapter 2, Subsection 2.3.5.1, last paragraph will be revised from:

For conservative estimates of radioactive decay, an overall half-life of 2.26 days is acceptable for short-lived noble gases and a half-life of eight days for iodines released to the atmosphere.

To read:

For conservative estimates of radioactive decay, an overall half-life of 2.26 days for short-lived noble gases and a half-life of eight days for iodines released to the atmosphere are acceptable.

4. COLA Part 2, FSAR, Chapter 2, Section 2.3.5.1, last paragraph will also be revised from:

The calculation results with and without consideration of dry deposition are identified in the output as "depleted" and "undepleted." Terrain recirculation was considered consistent with Regulatory Guide 1.111.

To read:

The calculation results with and without consideration of dry deposition are identified in the output as "depleted" and "undepleted." Adjustments for recirculation and effective stack height are addressed using XOQDOQ default open terrain correction factors and site specific terrain features, respectively.

5. COLA Part 2, FSAR, Chapter 2, Subsection 2.3.5.2, will be revised from:

Estimates of χ/Q (undecayed and undepleted; depleted for radioiodines) and D/Q radioiodines and particulates is provided at each of these grid points. The results of the analysis, based on one year of data collected on site, are presented in Tables 2.3-323, 2.3-324, 2.3-325, 2.3-326, 2.3-327, 2.3-328, 2.3-329, 2.3-330, and 2.3-231.

To read:

Estimates of χ/Q and D/Q are provided at each of these grid points. The results of the analysis, based on one year of data collected on site, are presented in Tables 2.3-323, 2.3-324, 2.3-325, 2.3-326, 2.3-327, and 2.3-328.

6. COLA Part 2, FSAR, Chapter 2, Section 2.3, Tables 2.3-322 through 2.3-328 will be replaced in their entirety with the tables in Attachment 02.03.05-02A.

Enclosure
TVA Letter Dated: August 13, 2008
RAI Responses

7. COLA Part 2, FSAR, Chapter 2, Section 2.3 Tables 2.3-329, 2.3-330 and 2.3-331 will be deleted as indicated in Attachment 02.03.05-02A.

ATTACHMENTS:

Attachment 02.03.05-02A

Attachment 02.03.05-02A
TVA Letter Dated: August 13, 2008
RAI Responses

Attachment 02.03.05-02A
FSAR Section 2.3 Table Replacements
Tables 2.3-322 through 2.3-331
(22 pages)

TABLE 2.3-322
BLN OFFSITE RECEPTOR LOCATIONS ¹

	Garden	Milk Cow	Milk Goat	House	Animal for Meat
S	7900			7634	
SSW	6039			5656	
SW	1817	3907		2907	3907
WSW	1780	7409		4101	7409
W	1813	2457		2324	2457
WNW	1213	1286		1187	1286
NW	1095	1250	3809	1113	1250
NNW	1831	2186		1124	2186
N	2368	4646		1454	4646
NNE	2246	3622	4193	1908	3622
NE	6079	6914	7686	7111	6914
ENE	5600	6243		5667	6243
E	3911	3783	3785	3478	3783
ESE	4444	6103	6958	3363	6103
SE	3830	3568	7197	3120	3568
SSE				7758	

Notes:

1. Distances, in meters, from the site center to the nearest receptor of each type for a given sector.

TABLE 2.3-323 (Sheet 1 of 3)
ANNUAL AVERAGE γ/Q (sec/m³) FOR NO DECAY, UNDEPLETED
FOR EACH 22.5° SECTOR AT THE DISTANCES (MILES) SHOWN AT THE TOP

SECTOR	0.25	0.5	0.75	1	1.5	2	2.5	3	3.5	4	4.5
S	3.54E-06	1.39E-06	1.12E-06	8.46E-07	6.88E-07	2.06E-06	1.29E-06	8.88E-07	6.56E-07	5.09E-07	4.09E-07
SSW	4.82E-06	1.81E-06	1.51E-06	1.22E-06	9.04E-07	6.85E-07	5.35E-07	4.30E-07	3.56E-07	8.33E-07	7.33E-07
SW	4.86E-06	1.76E-06	1.45E-06	1.17E-06	8.63E-07	6.56E-07	5.14E-07	4.16E-07	3.45E-07	2.93E-07	2.53E-07
WSW	1.06E-06	3.93E-07	3.38E-07	2.91E-07	2.40E-07	1.95E-07	1.60E-07	1.33E-07	1.14E-07	9.87E-08	8.69E-08
W	3.26E-07	1.22E-07	1.05E-07	8.70E-08	7.18E-08	6.21E-08	5.46E-08	4.86E-08	4.37E-08	3.96E-08	3.62E-08
WNW	4.26E-07	1.64E-07	1.42E-07	1.15E-07	8.66E-08	6.80E-08	5.54E-08	4.65E-08	4.00E-08	2.86E-07	2.32E-07
NW	1.07E-06	3.94E-07	2.95E-07	2.05E-07	1.28E-07	9.21E-08	7.16E-08	5.85E-08	2.05E-07	3.58E-07	2.90E-07
NNW	1.31E-06	5.21E-07	4.16E-07	3.03E-07	2.00E-07	1.48E-07	1.17E-07	9.63E-08	3.05E-07	4.77E-07	3.86E-07
N	2.33E-06	9.03E-07	6.88E-07	4.89E-07	3.21E-07	2.40E-07	1.91E-07	1.59E-07	1.36E-07	1.19E-07	1.05E-07
NNE	5.80E-06	2.06E-06	1.45E-06	1.00E-06	6.50E-07	4.83E-07	3.83E-07	3.15E-07	2.68E-07	2.32E-07	2.05E-07
NE	4.12E-06	1.49E-06	1.08E-06	7.70E-07	5.19E-07	3.89E-07	3.07E-07	1.10E-06	1.23E-06	9.60E-07	7.75E-07
ENE	2.31E-06	8.81E-07	6.52E-07	4.59E-07	2.93E-07	1.50E-06	9.41E-07	6.53E-07	4.84E-07	3.77E-07	3.04E-07
E	1.50E-06	6.26E-07	4.85E-07	3.54E-07	6.15E-07	9.94E-07	6.20E-07	4.28E-07	3.17E-07	2.46E-07	1.98E-07
ESE	1.21E-06	5.16E-07	3.94E-07	2.74E-07	1.17E-06	6.98E-07	4.36E-07	3.02E-07	2.24E-07	1.74E-07	1.40E-07
SE	1.38E-06	5.36E-07	4.26E-07	3.16E-07	1.31E-06	7.70E-07	4.79E-07	3.31E-07	2.44E-07	1.89E-07	1.52E-07
SSE	2.25E-06	8.75E-07	6.72E-07	4.80E-07	2.11E-06	1.28E-06	8.02E-07	5.55E-07	4.11E-07	3.20E-07	2.58E-07

TABLE 2.3-323 (Sheet 2 of 3)
ANNUAL AVERAGE χ/Q (sec/m³) FOR NO DECAY, UNDEPLETED
FOR EACH 22.5° SECTOR AT THE DISTANCES (MILES) SHOWN AT THE TOP

SECTOR	5	7.5	10	15	20	25	30	35	40	45	50
S	3.38E-07	1.73E-07	1.12E-07	6.46E-08	4.39E-08	3.26E-08	2.56E-08	2.09E-08	1.76E-08	1.51E-08	1.31E-08
SSW	6.06E-07	3.10E-07	2.01E-07	1.15E-07	7.82E-08	5.80E-08	4.55E-08	3.71E-08	3.11E-08	2.66E-08	2.32E-08
SW	2.63E-07	3.86E-07	2.52E-07	1.46E-07	9.97E-08	7.44E-08	5.87E-08	4.80E-08	4.04E-08	3.48E-08	3.04E-08
WSW	7.75E-08	2.22E-07	1.46E-07	8.61E-08	5.94E-08	4.47E-08	3.55E-08	2.92E-08	2.47E-08	2.13E-08	1.87E-08
W	3.33E-08	1.35E-07	8.92E-08	5.27E-08	3.65E-08	2.75E-08	2.18E-08	1.80E-08	1.52E-08	1.32E-08	1.16E-08
WNW	1.93E-07	1.01E-07	6.68E-08	3.94E-08	2.72E-08	2.05E-08	1.63E-08	1.34E-08	1.14E-08	9.83E-09	8.63E-09
NW	2.41E-07	1.27E-07	8.37E-08	4.95E-08	3.42E-08	2.58E-08	2.05E-08	1.69E-08	1.43E-08	1.24E-08	1.09E-08
NNW	3.20E-07	1.68E-07	1.10E-07	6.48E-08	4.47E-08	3.36E-08	2.67E-08	2.19E-08	1.86E-08	1.60E-08	1.40E-08
N	9.42E-08	6.38E-08	1.73E-07	1.01E-07	6.98E-08	5.24E-08	4.16E-08	3.42E-08	2.89E-08	2.49E-08	2.18E-08
NNE	1.83E-07	1.23E-07	3.75E-07	2.21E-07	1.53E-07	1.15E-07	9.13E-08	7.52E-08	6.37E-08	5.50E-08	4.82E-08
NE	6.44E-07	3.36E-07	2.21E-07	1.29E-07	8.89E-08	6.67E-08	5.29E-08	4.35E-08	3.67E-08	3.16E-08	2.77E-08
ENE	2.52E-07	1.31E-07	8.57E-08	5.01E-08	3.44E-08	2.57E-08	2.04E-08	1.67E-08	1.41E-08	1.22E-08	1.06E-08
E	1.64E-07	8.42E-08	5.48E-08	3.17E-08	2.16E-08	1.61E-08	1.27E-08	1.04E-08	8.72E-09	7.49E-09	6.54E-09
ESE	1.16E-07	5.99E-08	3.91E-08	2.28E-08	1.56E-08	1.17E-08	9.22E-09	7.57E-09	6.38E-09	5.50E-09	4.81E-09
SE	1.25E-07	6.40E-08	4.14E-08	2.38E-08	1.61E-08	1.20E-08	9.38E-09	7.65E-09	6.42E-09	5.50E-09	4.80E-09
SSE	2.13E-07	1.10E-07	7.20E-08	4.19E-08	2.87E-08	2.14E-08	1.69E-08	1.39E-08	1.17E-08	1.01E-08	8.83E-09

2.3-323 (Sheet 3 of 3)
 ANNUAL AVERAGE χ/Q (sec/m³) FOR NO DECAY, UNDEPLETED
 FOR EACH 22.5° SECTOR AT THE SEGMENTS (MILES) SHOWN AT THE TOP

SECTOR	5-1	1-2	2-3	3-4	4-5	5-10	10-20	20-30	30-40	40-50
S	1.06E-06	1.33E-06	1.33E-06	6.66E-07	4.12E-07	1.83E-07	6.59E-08	3.28E-08	2.10E-08	1.51E-08
SSW	1.45E-06	8.77E-07	5.33E-07	5.59E-07	7.15E-07	3.27E-07	1.18E-07	5.84E-08	3.72E-08	2.67E-08
SW	1.40E-06	8.39E-07	5.12E-07	3.46E-07	2.69E-07	2.99E-07	1.49E-07	7.49E-08	4.82E-08	3.48E-08
WSW	3.29E-07	2.31E-07	1.58E-07	1.14E-07	8.69E-08	1.56E-07	8.76E-08	4.49E-08	2.93E-08	2.13E-08
W	1.01E-07	7.08E-08	5.42E-08	4.35E-08	3.61E-08	9.21E-08	5.36E-08	2.76E-08	1.80E-08	1.32E-08
WNW	1.35E-07	8.47E-08	5.52E-08	1.36E-07	2.33E-07	1.06E-07	4.01E-08	2.06E-08	1.35E-08	9.84E-09
NW	2.77E-07	1.29E-07	7.18E-08	2.21E-07	2.92E-07	1.33E-07	5.03E-08	2.60E-08	1.70E-08	1.24E-08
NNW	3.89E-07	2.00E-07	1.17E-07	3.11E-07	3.89E-07	1.76E-07	6.60E-08	3.38E-08	2.20E-08	1.60E-08
N	6.47E-07	3.22E-07	1.91E-07	1.36E-07	1.05E-07	1.19E-07	1.03E-07	5.27E-08	3.43E-08	2.49E-08
NNE	1.39E-06	6.54E-07	3.83E-07	2.68E-07	2.05E-07	2.48E-07	2.25E-07	1.16E-07	7.54E-08	5.50E-08
NE	1.03E-06	5.17E-07	6.46E-07	1.09E-06	7.81E-07	3.53E-07	1.32E-07	6.71E-08	4.36E-08	3.17E-08
ENE	6.17E-07	8.66E-07	9.75E-07	4.92E-07	3.07E-07	1.38E-07	5.10E-08	2.59E-08	1.68E-08	1.22E-08
E	4.58E-07	7.25E-07	6.43E-07	3.22E-07	1.99E-07	8.88E-08	3.23E-08	1.62E-08	1.04E-08	7.51E-09
ESE	3.68E-07	7.60E-07	4.52E-07	2.27E-07	1.41E-07	6.31E-08	2.32E-08	1.17E-08	7.59E-09	5.50E-09
SE	4.02E-07	8.50E-07	4.97E-07	2.48E-07	1.53E-07	6.76E-08	2.43E-08	1.20E-08	7.68E-09	5.51E-09
SSE	6.32E-07	1.38E-06	8.31E-07	4.18E-07	2.60E-07	1.16E-07	4.27E-08	2.16E-08	1.39E-08	1.01E-08

TABLE 2.3-324 (Sheet 1 of 3)
ANNUAL AVERAGE χ/Q (sec/m³) FOR NO DECAY, DEPLETED
FOR EACH 22.5° SECTOR AT THE DISTANCES (MILES) SHOWN AT THE TOP

SECTOR	0.25	0.5	0.75	1	1.5	2	2.5	3	3.5	4	4.5
S	3.30E-06	1.28E-06	1.04E-06	8.00E-07	6.61E-07	2.01E-06	1.23E-06	8.38E-07	6.10E-07	4.66E-07	3.70E-07
SSW	4.49E-06	1.66E-06	1.41E-06	1.16E-06	8.69E-07	6.60E-07	5.16E-07	4.15E-07	3.43E-07	8.19E-07	7.13E-07
SW	4.53E-06	1.62E-06	1.36E-06	1.11E-06	8.30E-07	6.32E-07	4.96E-07	4.01E-07	3.33E-07	2.82E-07	2.44E-07
WSW	9.82E-07	3.62E-07	3.17E-07	2.78E-07	2.32E-07	1.89E-07	1.55E-07	1.30E-07	1.11E-07	9.60E-08	8.45E-08
W	3.04E-07	1.13E-07	9.78E-08	8.29E-08	6.94E-08	6.03E-08	5.32E-08	4.74E-08	4.27E-08	3.87E-08	3.54E-08
WNW	3.97E-07	1.52E-07	1.33E-07	1.10E-07	8.34E-08	6.57E-08	5.36E-08	4.50E-08	3.87E-08	2.83E-07	2.26E-07
NW	9.96E-07	3.62E-07	2.73E-07	1.92E-07	1.21E-07	8.71E-08	6.78E-08	5.54E-08	2.02E-07	3.53E-07	2.82E-07
NNW	1.22E-06	4.81E-07	3.88E-07	2.86E-07	1.90E-07	1.41E-07	1.12E-07	9.23E-08	3.01E-07	4.70E-07	3.75E-07
N	2.17E-06	8.34E-07	6.40E-07	4.59E-07	3.04E-07	2.29E-07	1.83E-07	1.52E-07	1.30E-07	1.14E-07	1.01E-07
NNE	5.40E-06	1.89E-06	1.34E-06	9.32E-07	6.14E-07	4.59E-07	3.65E-07	3.02E-07	2.56E-07	2.23E-07	1.96E-07
NE	3.84E-06	1.37E-06	9.96E-07	7.20E-07	4.92E-07	3.71E-07	2.93E-07	1.09E-06	1.21E-06	9.30E-07	7.42E-07
ENE	2.15E-06	8.13E-07	6.05E-07	4.31E-07	2.78E-07	1.48E-06	9.09E-07	6.20E-07	4.54E-07	3.48E-07	2.78E-07
E	1.40E-06	5.82E-07	4.54E-07	3.35E-07	6.03E-07	9.69E-07	5.93E-07	4.03E-07	2.94E-07	2.25E-07	1.79E-07
ESE	1.13E-06	4.81E-07	3.69E-07	2.59E-07	1.16E-06	6.77E-07	4.15E-07	2.83E-07	2.06E-07	1.58E-07	1.26E-07
SE	1.29E-06	4.94E-07	3.97E-07	2.98E-07	1.30E-06	7.46E-07	4.56E-07	3.09E-07	2.25E-07	1.72E-07	1.36E-07
SSE	2.10E-06	8.08E-07	6.26E-07	4.52E-07	2.09E-06	1.24E-06	7.63E-07	5.20E-07	3.79E-07	2.91E-07	2.31E-07

TABLE 2.3-324 (Sheet 2 of 3)
ANNUAL AVERAGE χ/Q (sec/m³) FOR NO DECAY, DEPLETED
FOR EACH 22.5° SECTOR AT THE DISTANCES (MILES) SHOWN AT THE TOP

SECTOR	5	7.5	10	15	20	25	30	35	40	45	50
S	3.02E-07	1.48E-07	9.22E-08	4.99E-08	3.22E-08	2.30E-08	1.74E-08	1.37E-08	1.12E-08	9.33E-09	7.92E-09
SSW	5.83E-07	2.86E-07	1.79E-07	9.69E-08	6.28E-08	4.48E-08	3.40E-08	2.69E-08	2.19E-08	1.83E-08	1.56E-08
SW	2.54E-07	3.67E-07	2.31E-07	1.27E-07	8.30E-08	5.97E-08	4.56E-08	3.63E-08	2.97E-08	2.49E-08	2.13E-08
WSW	7.53E-08	2.15E-07	1.37E-07	7.63E-08	5.05E-08	3.66E-08	2.81E-08	2.25E-08	1.85E-08	1.56E-08	1.34E-08
W	3.26E-08	1.31E-07	8.38E-08	4.69E-08	3.11E-08	2.26E-08	1.74E-08	1.39E-08	1.15E-08	9.68E-09	8.31E-09
WNW	1.86E-07	9.36E-08	5.96E-08	3.32E-08	2.20E-08	1.59E-08	1.22E-08	9.77E-09	8.05E-09	6.78E-09	5.81E-09
NW	2.32E-07	1.17E-07	7.45E-08	4.16E-08	2.75E-08	1.99E-08	1.53E-08	1.23E-08	1.01E-08	8.51E-09	7.30E-09
NNW	3.08E-07	1.55E-07	9.81E-08	5.44E-08	3.59E-08	2.60E-08	1.99E-08	1.59E-08	1.31E-08	1.10E-08	9.40E-09
N	9.06E-08	6.15E-08	1.66E-07	9.25E-08	6.11E-08	4.43E-08	3.41E-08	2.72E-08	2.24E-08	1.89E-08	1.62E-08
NNE	1.76E-07	1.18E-07	3.62E-07	2.02E-07	1.34E-07	9.74E-08	7.50E-08	6.01E-08	4.96E-08	4.18E-08	3.59E-08
NE	6.09E-07	3.04E-07	1.93E-07	1.07E-07	6.99E-08	5.05E-08	3.86E-08	3.08E-08	2.53E-08	2.12E-08	1.81E-08
ENE	2.28E-07	1.13E-07	7.11E-08	3.90E-08	2.55E-08	1.83E-08	1.40E-08	1.11E-08	9.08E-09	7.61E-09	6.49E-09
E	1.46E-07	7.18E-08	4.49E-08	2.44E-08	1.58E-08	1.13E-08	8.58E-09	6.78E-09	5.53E-09	4.62E-09	3.93E-09
ESE	1.03E-07	5.08E-08	3.19E-08	1.74E-08	1.14E-08	8.14E-09	6.20E-09	4.92E-09	4.02E-09	3.36E-09	2.86E-09
SE	1.11E-07	5.42E-08	3.37E-08	1.82E-08	1.17E-08	8.32E-09	6.29E-09	4.96E-09	4.04E-09	3.36E-09	2.85E-09
SSE	1.89E-07	9.35E-08	5.87E-08	3.21E-08	2.09E-08	1.50E-08	1.14E-08	9.03E-09	7.38E-09	6.17E-09	5.26E-09

TABLE 2.3-324 (Sheet 3 of 3)
ANNUAL AVERAGE χ/Q (sec/m³) FOR NO DECAY, DEPLETED
FOR EACH 22.5° SECTOR AT THE SEGMENTS (MILES) SHOWN AT THE TOP

SECTOR	.5-1	1-2	2-3	3-4	4-5	5-10	10-20	20-30	30-40	40-50
S	9.87E-07	1.29E-06	1.28E-06	6.20E-07	3.74E-07	1.57E-07	5.14E-08	2.32E-08	1.38E-08	9.36E-09
SSW	1.36E-06	8.42E-07	5.14E-07	5.45E-07	6.96E-07	3.04E-07	9.99E-08	4.53E-08	2.70E-08	1.84E-08
SW	1.31E-06	8.04E-07	4.94E-07	3.33E-07	2.59E-07	2.82E-07	1.31E-07	6.03E-08	3.64E-08	2.50E-08
WSW	3.09E-07	2.23E-07	1.54E-07	1.11E-07	8.45E-08	1.49E-07	7.83E-08	3.69E-08	2.26E-08	1.57E-08
W	9.45E-08	6.84E-08	5.28E-08	4.25E-08	3.53E-08	8.83E-08	4.81E-08	2.28E-08	1.40E-08	9.71E-09
WNW	1.27E-07	8.15E-08	5.34E-08	1.34E-07	2.28E-07	9.90E-08	3.41E-08	1.60E-08	9.82E-09	6.79E-09
NW	2.57E-07	1.21E-07	6.80E-08	2.18E-07	2.84E-07	1.24E-07	4.26E-08	2.01E-08	1.23E-08	8.53E-09
NNW	3.64E-07	1.90E-07	1.12E-07	3.06E-07	3.78E-07	1.64E-07	5.59E-08	2.62E-08	1.60E-08	1.10E-08
N	6.03E-07	3.05E-07	1.83E-07	1.30E-07	1.01E-07	1.15E-07	9.49E-08	4.47E-08	2.74E-08	1.90E-08
NNE	1.28E-06	6.16E-07	3.65E-07	2.56E-07	1.97E-07	2.39E-07	2.07E-07	9.82E-08	6.03E-08	4.19E-08
NE	9.56E-07	4.89E-07	6.32E-07	1.07E-06	7.48E-07	3.22E-07	1.09E-07	5.09E-08	3.09E-08	2.13E-08
ENE	5.74E-07	8.44E-07	9.45E-07	4.61E-07	2.80E-07	1.20E-07	4.01E-08	1.85E-08	1.12E-08	7.63E-09
E	4.29E-07	7.06E-07	6.17E-07	2.99E-07	1.80E-07	7.64E-08	2.51E-08	1.14E-08	6.82E-09	4.63E-09
ESE	3.45E-07	7.43E-07	4.32E-07	2.10E-07	1.27E-07	5.40E-08	1.79E-08	8.22E-09	4.94E-09	3.37E-09
SE	3.75E-07	8.30E-07	4.75E-07	2.29E-07	1.37E-07	5.77E-08	1.88E-08	8.41E-09	4.99E-09	3.37E-09
SSE	5.89E-07	1.35E-06	7.94E-07	3.86E-07	2.33E-07	9.93E-08	3.30E-08	1.51E-08	9.07E-09	6.19E-09

TABLE 2.3-325 (Sheet 1 of 3)
ANNUAL AVERAGE γ/Q (sec/m³) FOR 2.26 DAY DECAY, UNDEPLETED
FOR EACH 22.5° SECTOR AT THE DISTANCES (MILES) SHOWN AT THE TOP

SECTOR	0.25	0.5	0.75	1	1.5	2	2.5	3	3.5	4	4.5
S	3.53E-06	1.38E-06	1.12E-06	8.43E-07	6.83E-07	2.01E-06	1.25E-06	8.55E-07	6.27E-07	4.83E-07	3.86E-07
SSW	4.82E-06	1.80E-06	1.51E-06	1.22E-06	8.96E-07	6.76E-07	5.26E-07	4.21E-07	3.47E-07	7.92E-07	6.91E-07
SW	4.86E-06	1.76E-06	1.45E-06	1.17E-06	8.57E-07	6.48E-07	5.06E-07	4.07E-07	3.36E-07	2.84E-07	2.44E-07
WSW	1.05E-06	3.92E-07	3.37E-07	2.90E-07	2.37E-07	1.91E-07	1.56E-07	1.30E-07	1.10E-07	9.48E-08	8.29E-08
W	3.26E-07	1.22E-07	1.04E-07	8.66E-08	7.10E-08	6.10E-08	5.32E-08	4.70E-08	4.18E-08	3.76E-08	3.41E-08
WNW	4.25E-07	1.64E-07	1.41E-07	1.15E-07	8.59E-08	6.72E-08	5.44E-08	4.54E-08	3.88E-08	2.66E-07	2.13E-07
NW	1.07E-06	3.94E-07	2.95E-07	2.05E-07	1.27E-07	9.11E-08	7.05E-08	5.72E-08	1.94E-07	3.32E-07	2.66E-07
NNW	1.31E-06	5.20E-07	4.15E-07	3.02E-07	1.99E-07	1.46E-07	1.15E-07	9.40E-08	2.89E-07	4.44E-07	3.55E-07
N	2.33E-06	9.02E-07	6.86E-07	4.87E-07	3.18E-07	2.37E-07	1.88E-07	1.55E-07	1.32E-07	1.14E-07	1.00E-07
NNE	5.79E-06	2.05E-06	1.45E-06	9.99E-07	6.46E-07	4.77E-07	3.76E-07	3.08E-07	2.60E-07	2.24E-07	1.96E-07
NE	4.12E-06	1.49E-06	1.08E-06	7.67E-07	5.15E-07	3.84E-07	3.01E-07	1.06E-06	1.17E-06	9.02E-07	7.23E-07
ENE	2.30E-06	8.80E-07	6.51E-07	4.57E-07	2.91E-07	1.46E-06	9.06E-07	6.24E-07	4.59E-07	3.55E-07	2.84E-07
E	1.49E-06	6.25E-07	4.84E-07	3.53E-07	6.08E-07	9.66E-07	5.99E-07	4.11E-07	3.02E-07	2.32E-07	1.86E-07
ESE	1.21E-06	5.15E-07	3.94E-07	2.73E-07	1.14E-06	6.78E-07	4.21E-07	2.89E-07	2.13E-07	1.64E-07	1.31E-07
SE	1.38E-06	5.35E-07	4.26E-07	3.15E-07	1.29E-06	7.53E-07	4.66E-07	3.20E-07	2.35E-07	1.81E-07	1.44E-07
SSE	2.25E-06	8.74E-07	6.71E-07	4.78E-07	2.07E-06	1.25E-06	7.73E-07	5.31E-07	3.91E-07	3.01E-07	2.41E-07

TABLE 2.3-325 (Sheet 2 of 3)
ANNUAL AVERAGE χ/Q (sec/m³) FOR 2.26 DAY DECAY, UNDEPLETED
FOR EACH 22.5° SECTOR AT THE DISTANCES (MILES) SHOWN AT THE TOP

SECTOR	5	7.5	10	15	20	25	30	35	40	45	50
S	3.17E-07	1.57E-07	9.82E-08	5.29E-08	3.36E-08	2.34E-08	1.73E-08	1.32E-08	1.05E-08	8.45E-09	6.96E-09
SSW	5.67E-07	2.81E-07	1.76E-07	9.45E-08	6.01E-08	4.18E-08	3.09E-08	2.37E-08	1.87E-08	1.52E-08	1.25E-08
SW	2.51E-07	3.46E-07	2.17E-07	1.17E-07	7.46E-08	5.19E-08	3.82E-08	2.93E-08	2.31E-08	1.86E-08	1.53E-08
WSW	7.35E-08	1.96E-07	1.24E-07	6.71E-08	4.27E-08	2.97E-08	2.18E-08	1.66E-08	1.30E-08	1.05E-08	8.54E-09
W	3.11E-08	1.17E-07	7.34E-08	3.94E-08	2.48E-08	1.70E-08	1.23E-08	9.28E-09	7.19E-09	5.69E-09	4.58E-09
WNW	1.76E-07	8.81E-08	5.55E-08	2.99E-08	1.89E-08	1.30E-08	9.48E-09	7.17E-09	5.58E-09	4.44E-09	3.59E-09
NW	2.19E-07	1.10E-07	6.93E-08	3.73E-08	2.36E-08	1.62E-08	1.18E-08	8.91E-09	6.93E-09	5.50E-09	4.45E-09
NNW	2.92E-07	1.46E-07	9.18E-08	4.93E-08	3.11E-08	2.14E-08	1.56E-08	1.18E-08	9.18E-09	7.30E-09	5.92E-09
N	8.93E-08	5.83E-08	1.45E-07	7.82E-08	4.95E-08	3.42E-08	2.50E-08	1.90E-08	1.49E-08	1.19E-08	9.68E-09
NNE	1.74E-07	1.13E-07	3.15E-07	1.70E-07	1.08E-07	7.49E-08	5.48E-08	4.17E-08	3.27E-08	2.62E-08	2.13E-08
NE	5.96E-07	2.99E-07	1.89E-07	1.03E-07	6.55E-08	4.57E-08	3.38E-08	2.59E-08	2.04E-08	1.65E-08	1.36E-08
ENE	2.34E-07	1.17E-07	7.36E-08	3.98E-08	2.54E-08	1.77E-08	1.30E-08	9.97E-09	7.86E-09	6.34E-09	5.20E-09
E	1.52E-07	7.56E-08	4.74E-08	2.55E-08	1.62E-08	1.13E-08	8.28E-09	6.34E-09	5.00E-09	4.03E-09	3.31E-09
ESE	1.08E-07	5.37E-08	3.37E-08	1.82E-08	1.16E-08	8.06E-09	5.94E-09	4.54E-09	3.58E-09	2.89E-09	2.37E-09
SE	1.18E-07	5.88E-08	3.69E-08	2.00E-08	1.28E-08	9.01E-09	6.70E-09	5.18E-09	4.13E-09	3.37E-09	2.79E-09
SSE	1.98E-07	9.85E-08	6.19E-08	3.33E-08	2.12E-08	1.47E-08	1.08E-08	8.27E-09	6.50E-09	5.23E-09	4.29E-09

TABLE 2.3-325 (Sheet 3 of 3)
ANNUAL AVERAGE χ/Q (sec/m³) FOR 2.26 DAY DECAY, UNDEPLETED
FOR EACH 22.5° SECTOR AT THE SEGMENTS (MILES) SHOWN AT THE TOP

SECTOR	5-1	1-2	2-3	3-4	4-5	5-10	10-20	20-30	30-40	40-50
S	1.05E-06	1.31E-06	1.29E-06	6.37E-07	3.89E-07	1.66E-07	5.44E-08	2.37E-08	1.33E-08	8.49E-09
SSW	1.45E-06	8.70E-07	5.24E-07	5.38E-07	6.75E-07	2.98E-07	9.73E-08	4.23E-08	2.39E-08	1.52E-08
SW	1.39E-06	8.33E-07	5.04E-07	3.37E-07	2.59E-07	2.68E-07	1.21E-07	5.25E-08	2.95E-08	1.87E-08
WSW	3.28E-07	2.29E-07	1.55E-07	1.10E-07	8.29E-08	1.37E-07	6.89E-08	3.00E-08	1.67E-08	1.05E-08
W	1.00E-07	7.00E-08	5.28E-08	4.17E-08	3.40E-08	7.84E-08	4.05E-08	1.72E-08	9.35E-09	5.72E-09
WNW	1.35E-07	8.40E-08	5.42E-08	1.27E-07	2.15E-07	9.31E-08	3.07E-08	1.32E-08	7.22E-09	4.46E-09
NW	2.77E-07	1.28E-07	7.07E-08	2.08E-07	2.68E-07	1.16E-07	3.83E-08	1.64E-08	8.98E-09	5.53E-09
NNW	3.88E-07	1.98E-07	1.15E-07	2.92E-07	3.58E-07	1.55E-07	5.07E-08	2.17E-08	1.19E-08	7.35E-09
N	6.46E-07	3.20E-07	1.88E-07	1.32E-07	1.00E-07	1.04E-07	8.04E-08	3.46E-08	1.92E-08	1.20E-08
NNE	1.38E-06	6.49E-07	3.76E-07	2.60E-07	1.96E-07	2.16E-07	1.75E-07	7.57E-08	4.20E-08	2.63E-08
NE	1.03E-06	5.13E-07	6.26E-07	1.04E-06	7.29E-07	3.16E-07	1.05E-07	4.62E-08	2.61E-08	1.66E-08
ENE	6.16E-07	8.46E-07	9.40E-07	4.67E-07	2.86E-07	1.24E-07	4.09E-08	1.79E-08	1.00E-08	6.37E-09
E	4.57E-07	7.10E-07	6.22E-07	3.06E-07	1.87E-07	8.01E-08	2.62E-08	1.14E-08	6.38E-09	4.05E-09
ESE	3.67E-07	7.44E-07	4.37E-07	2.16E-07	1.32E-07	5.68E-08	1.87E-08	8.15E-09	4.58E-09	2.90E-09
SE	4.01E-07	8.35E-07	4.84E-07	2.38E-07	1.46E-07	6.23E-08	2.06E-08	9.10E-09	5.22E-09	3.38E-09
SSE	6.30E-07	1.35E-06	8.02E-07	3.97E-07	2.43E-07	1.04E-07	3.43E-08	1.49E-08	8.32E-09	5.26E-09

TABLE 2.3-326 (Sheet 1 of 3)
ANNUAL AVERAGE χ/Q (sec/m³) FOR 8.00 DAY DECAY, DEPLETED
FOR EACH 22.5° SECTOR AT THE DISTANCES (MILES) SHOWN AT THE TOP

SECTOR	0.25	0.5	0.75	1	1.5	2	2.5	3	3.5	4	4.5
S	3.30E-06	1.28E-06	1.04E-06	7.99E-07	6.60E-07	2.00E-06	1.22E-06	8.28E-07	6.02E-07	4.59E-07	3.64E-07
SSW	4.49E-06	1.66E-06	1.41E-06	1.16E-06	8.67E-07	6.58E-07	5.13E-07	4.12E-07	3.40E-07	8.07E-07	7.01E-07
SW	4.53E-06	1.62E-06	1.36E-06	1.11E-06	8.28E-07	6.30E-07	4.93E-07	3.98E-07	3.30E-07	2.80E-07	2.41E-07
WSW	9.82E-07	3.61E-07	3.16E-07	2.78E-07	2.31E-07	1.88E-07	1.54E-07	1.29E-07	1.10E-07	9.48E-08	8.33E-08
W	3.04E-07	1.13E-07	9.77E-08	8.28E-08	6.92E-08	6.00E-08	5.28E-08	4.70E-08	4.22E-08	3.81E-08	3.48E-08
WNW	3.97E-07	1.52E-07	1.33E-07	1.10E-07	8.33E-08	6.55E-08	5.33E-08	4.47E-08	3.83E-08	2.77E-07	2.21E-07
NW	9.96E-07	3.62E-07	2.73E-07	1.91E-07	1.20E-07	8.68E-08	6.75E-08	5.51E-08	1.99E-07	3.45E-07	2.75E-07
NNW	1.22E-06	4.81E-07	3.88E-07	2.86E-07	1.90E-07	1.41E-07	1.11E-07	9.16E-08	2.97E-07	4.60E-07	3.67E-07
N	2.17E-06	8.34E-07	6.39E-07	4.59E-07	3.04E-07	2.28E-07	1.82E-07	1.51E-07	1.29E-07	1.12E-07	9.95E-08
NNE	5.40E-06	1.89E-06	1.34E-06	9.32E-07	6.12E-07	4.57E-07	3.63E-07	2.99E-07	2.54E-07	2.20E-07	1.94E-07
NE	3.84E-06	1.37E-06	9.96E-07	7.19E-07	4.91E-07	3.70E-07	2.92E-07	1.08E-06	1.19E-06	9.13E-07	7.27E-07
ENE	2.15E-06	8.13E-07	6.05E-07	4.30E-07	2.78E-07	1.46E-06	8.99E-07	6.12E-07	4.47E-07	3.42E-07	2.72E-07
E	1.40E-06	5.81E-07	4.53E-07	3.35E-07	6.01E-07	9.61E-07	5.87E-07	3.98E-07	2.90E-07	2.21E-07	1.76E-07
ESE	1.13E-06	4.80E-07	3.69E-07	2.59E-07	1.15E-06	6.71E-07	4.11E-07	2.79E-07	2.03E-07	1.56E-07	1.23E-07
SE	1.29E-06	4.94E-07	3.97E-07	2.98E-07	1.29E-06	7.42E-07	4.52E-07	3.06E-07	2.22E-07	1.70E-07	1.34E-07
SSE	2.10E-06	8.08E-07	6.25E-07	4.51E-07	2.08E-06	1.23E-06	7.55E-07	5.13E-07	3.74E-07	2.86E-07	2.27E-07

TABLE 2.3-326 (Sheet 2 of 3)
ANNUAL AVERAGE χ/Q (sec/m³) FOR 8.00 DAY DECAY, DEPLETED
FOR EACH 22.5° SECTOR AT THE DISTANCES (MILES) SHOWN AT THE TOP

SECTOR	5	7.5	10	15	20	25	30	35	40	45	50
S	2.97E-07	1.44E-07	8.87E-08	4.70E-08	2.98E-08	2.08E-08	1.54E-08	1.19E-08	9.52E-09	7.77E-09	6.47E-09
SSW	5.72E-07	2.78E-07	1.72E-07	9.14E-08	5.80E-08	4.06E-08	3.02E-08	2.34E-08	1.87E-08	1.53E-08	1.28E-08
SW	2.51E-07	3.56E-07	2.22E-07	1.19E-07	7.62E-08	5.36E-08	4.00E-08	3.11E-08	2.50E-08	2.05E-08	1.71E-08
WSW	7.41E-08	2.08E-07	1.31E-07	7.10E-08	4.58E-08	3.24E-08	2.43E-08	1.90E-08	1.53E-08	1.26E-08	1.05E-08
W	3.19E-08	1.26E-07	7.93E-08	4.31E-08	2.78E-08	1.96E-08	1.47E-08	1.14E-08	9.18E-09	7.53E-09	6.29E-09
WNW	1.81E-07	9.00E-08	5.65E-08	3.07E-08	1.97E-08	1.39E-08	1.04E-08	8.10E-09	6.50E-09	5.33E-09	4.45E-09
NW	2.26E-07	1.12E-07	7.05E-08	3.83E-08	2.47E-08	1.74E-08	1.30E-08	1.01E-08	8.12E-09	6.65E-09	5.55E-09
NNW	3.00E-07	1.49E-07	9.30E-08	5.03E-08	3.23E-08	2.27E-08	1.70E-08	1.32E-08	1.06E-08	8.65E-09	7.21E-09
N	8.91E-08	5.98E-08	1.58E-07	8.58E-08	5.52E-08	3.90E-08	2.93E-08	2.28E-08	1.83E-08	1.51E-08	1.26E-08
NNE	1.73E-07	1.15E-07	3.44E-07	1.87E-07	1.21E-07	8.57E-08	6.44E-08	5.03E-08	4.05E-08	3.33E-08	2.79E-08
NE	5.96E-07	2.94E-07	1.84E-07	9.95E-08	6.39E-08	4.51E-08	3.37E-08	2.63E-08	2.11E-08	1.73E-08	1.45E-08
ENE	2.23E-07	1.09E-07	6.80E-08	3.65E-08	2.33E-08	1.64E-08	1.22E-08	9.47E-09	7.58E-09	6.21E-09	5.17E-09
E	1.43E-07	6.96E-08	4.31E-08	2.29E-08	1.45E-08	1.02E-08	7.54E-09	5.83E-09	4.66E-09	3.80E-09	3.17E-09
ESE	1.01E-07	4.92E-08	3.06E-08	1.63E-08	1.04E-08	7.29E-09	5.42E-09	4.21E-09	3.36E-09	2.75E-09	2.29E-09
SE	1.09E-07	5.29E-08	3.26E-08	1.73E-08	1.09E-08	7.64E-09	5.68E-09	4.40E-09	3.52E-09	2.88E-09	2.40E-09
SSE	1.85E-07	9.05E-08	5.62E-08	3.00E-08	1.91E-08	1.34E-08	9.93E-09	7.70E-09	6.15E-09	5.03E-09	4.19E-09

TABLE 2.3-326 (Sheet 3 of 3)
ANNUAL AVERAGE χ/Q (sec/m³) FOR 8.00 DAY DECAY, DEPLETED
FOR EACH 22.5° SECTOR AT THE SEGMENTS (MILES) SHOWN AT THE TOP

SECTOR	.5-1	1-2	2-3	3-4	4-5	5-10	10-20	20-30	30-40	40-50
S	9.86E-07	1.29E-06	1.27E-06	6.12E-07	3.67E-07	1.53E-07	4.86E-08	2.10E-08	1.20E-08	7.81E-09
SSW	1.36E-06	8.40E-07	5.11E-07	5.39E-07	6.84E-07	2.96E-07	9.44E-08	4.11E-08	2.36E-08	1.54E-08
SW	1.30E-06	8.02E-07	4.92E-07	3.30E-07	2.56E-07	2.73E-07	1.23E-07	5.42E-08	3.13E-08	2.06E-08
WSW	3.09E-07	2.22E-07	1.53E-07	1.09E-07	8.33E-08	1.44E-07	7.30E-08	3.27E-08	1.91E-08	1.26E-08
W	9.44E-08	6.81E-08	5.24E-08	4.20E-08	3.47E-08	8.43E-08	4.43E-08	1.98E-08	1.15E-08	7.56E-09
WNW	1.27E-07	8.13E-08	5.31E-08	1.31E-07	2.23E-07	9.54E-08	3.15E-08	1.41E-08	8.15E-09	5.35E-09
NW	2.57E-07	1.21E-07	6.77E-08	2.14E-07	2.78E-07	1.19E-07	3.94E-08	1.76E-08	1.02E-08	6.68E-09
NNW	3.63E-07	1.89E-07	1.11E-07	3.00E-07	3.70E-07	1.58E-07	5.18E-08	2.30E-08	1.33E-08	8.69E-09
N	6.02E-07	3.05E-07	1.82E-07	1.29E-07	9.95E-08	1.10E-07	8.83E-08	3.95E-08	2.30E-08	1.51E-08
NNE	1.28E-06	6.14E-07	3.63E-07	2.54E-07	1.94E-07	2.30E-07	1.93E-07	8.66E-08	5.06E-08	3.34E-08
NE	9.56E-07	4.88E-07	6.27E-07	1.05E-06	7.34E-07	3.12E-07	1.03E-07	4.56E-08	2.64E-08	1.74E-08
ENE	5.73E-07	8.38E-07	9.35E-07	4.54E-07	2.75E-07	1.16E-07	3.76E-08	1.66E-08	9.53E-09	6.23E-09
E	4.29E-07	7.02E-07	6.11E-07	2.95E-07	1.77E-07	7.42E-08	2.37E-08	1.03E-08	5.87E-09	3.82E-09
ESE	3.45E-07	7.39E-07	4.28E-07	2.07E-07	1.25E-07	5.24E-08	1.69E-08	7.37E-09	4.23E-09	2.76E-09
SE	3.74E-07	8.26E-07	4.71E-07	2.26E-07	1.36E-07	5.64E-08	1.79E-08	7.74E-09	4.43E-09	2.89E-09
SSE	5.89E-07	1.34E-06	7.86E-07	3.80E-07	2.29E-07	9.63E-08	3.10E-08	1.35E-08	7.75E-09	5.05E-09

TABLE 2.3-327 (Sheet 1 of 3)
ANNUAL AVERAGE D/Q (m²)
FOR EACH 22.5° SECTOR AT THE DISTANCES (MILES) SHOWN AT THE TOP

SECTOR	0.25	0.5	0.75	1	1.5	2	2.5	3	3.5	4	4.5
S	3.73E-08	1.66E-08	1.07E-08	6.10E-09	2.83E-09	3.44E-09	2.03E-09	1.33E-09	9.33E-10	6.92E-10	5.33E-10
SSW	3.50E-08	1.59E-08	1.06E-08	6.27E-09	2.82E-09	1.59E-09	1.01E-09	7.03E-10	5.14E-10	9.80E-10	8.66E-10
SW	3.50E-08	1.56E-08	1.04E-08	6.09E-09	2.72E-09	1.52E-09	9.65E-10	6.66E-10	4.86E-10	3.69E-10	2.89E-10
WSW	7.02E-09	3.24E-09	2.23E-09	1.36E-09	6.29E-10	3.60E-10	2.33E-10	1.62E-10	1.19E-10	9.11E-11	7.15E-11
W	2.36E-09	1.12E-09	7.77E-10	4.70E-10	2.15E-10	1.22E-10	7.79E-11	5.40E-11	3.96E-11	3.01E-11	2.36E-11
WNW	3.58E-09	1.68E-09	1.15E-09	6.88E-10	3.13E-10	1.78E-10	1.14E-10	7.92E-11	5.80E-11	1.49E-10	1.15E-10
NW	1.10E-08	4.51E-09	2.77E-09	1.53E-09	6.43E-10	3.48E-10	2.17E-10	1.47E-10	1.33E-10	2.15E-10	1.65E-10
NNW	1.36E-08	6.09E-09	3.83E-09	2.14E-09	9.14E-10	4.98E-10	3.12E-10	2.13E-10	1.94E-10	3.18E-10	2.45E-10
N	2.46E-08	1.09E-08	6.77E-09	3.72E-09	1.56E-09	8.36E-10	5.18E-10	3.52E-10	2.54E-10	1.92E-10	1.50E-10
NNE	5.51E-08	2.24E-08	1.32E-08	6.97E-09	2.82E-09	1.49E-09	9.15E-10	6.17E-10	4.44E-10	3.34E-10	2.60E-10
NE	4.23E-08	1.73E-08	1.03E-08	5.49E-09	2.25E-09	1.19E-09	7.36E-10	6.12E-10	1.08E-09	8.03E-10	6.19E-10
ENE	2.81E-08	1.16E-08	6.90E-09	3.70E-09	1.52E-09	1.98E-09	1.17E-09	7.64E-10	5.38E-10	3.98E-10	3.07E-10
E	1.93E-08	8.64E-09	5.21E-09	2.85E-09	1.55E-09	1.53E-09	8.98E-10	5.88E-10	4.14E-10	3.07E-10	2.36E-10
ESE	1.65E-08	7.46E-09	4.52E-09	2.47E-09	2.25E-09	1.15E-09	6.77E-10	4.43E-10	3.12E-10	2.31E-10	1.78E-10
SE	1.44E-08	6.27E-09	4.04E-09	2.31E-09	2.49E-09	1.30E-09	7.65E-10	5.01E-10	3.53E-10	2.61E-10	2.01E-10
SSE	2.79E-08	1.21E-08	7.55E-09	4.20E-09	3.75E-09	1.96E-09	1.16E-09	7.57E-10	5.32E-10	3.95E-10	3.04E-10

TABLE 2.3-327 (Sheet 2 of 3)
ANNUAL AVERAGE D/Q (m⁻²)
FOR EACH 22.5° SECTOR AT THE DISTANCES (MILES) SHOWN AT THE TOP

SECTOR	5	7.5	10	15	20	25	30	35	40	45	50
S	4.24E-10	1.88E-10	1.14E-10	5.76E-11	3.49E-11	2.34E-11	1.68E-11	1.26E-11	9.78E-12	7.81E-12	6.38E-12
SSW	6.89E-10	3.06E-10	1.85E-10	9.37E-11	5.67E-11	3.80E-11	2.72E-11	2.05E-11	1.59E-11	1.27E-11	1.04E-11
SW	2.46E-10	3.19E-10	1.93E-10	9.77E-11	5.91E-11	3.96E-11	2.84E-11	2.13E-11	1.66E-11	1.32E-11	1.08E-11
WSW	5.74E-11	1.06E-10	6.43E-11	3.25E-11	1.97E-11	1.32E-11	9.44E-12	7.09E-12	5.51E-12	4.40E-12	3.60E-12
W	1.90E-11	4.31E-11	2.61E-11	1.32E-11	7.98E-12	5.35E-12	3.83E-12	2.88E-12	2.24E-12	1.79E-12	1.46E-12
WNW	9.13E-11	4.06E-11	2.46E-11	1.24E-11	7.52E-12	5.04E-12	3.61E-12	2.71E-12	2.11E-12	1.69E-12	1.38E-12
NW	1.31E-10	5.84E-11	3.54E-11	1.79E-11	1.08E-11	7.25E-12	5.20E-12	3.90E-12	3.04E-12	2.42E-12	1.98E-12
NNW	1.95E-10	8.65E-11	5.24E-11	2.65E-11	1.60E-11	1.08E-11	7.70E-12	5.78E-12	4.50E-12	3.59E-12	2.93E-12
N	1.20E-10	5.46E-11	9.38E-11	4.74E-11	2.87E-11	1.92E-11	1.38E-11	1.04E-11	8.05E-12	6.43E-12	5.25E-12
NNE	2.08E-10	9.42E-11	1.95E-10	9.84E-11	5.95E-11	3.99E-11	2.86E-11	2.15E-11	1.67E-11	1.33E-11	1.09E-11
NE	4.92E-10	2.18E-10	1.32E-10	6.69E-11	4.05E-11	2.71E-11	1.95E-11	1.46E-11	1.14E-11	9.07E-12	7.40E-12
ENE	2.44E-10	1.08E-10	6.56E-11	3.32E-11	2.01E-11	1.35E-11	9.65E-12	7.24E-12	5.63E-12	4.50E-12	3.67E-12
E	1.88E-10	8.34E-11	5.05E-11	2.55E-11	1.55E-11	1.04E-11	7.42E-12	5.57E-12	4.33E-12	3.46E-12	2.83E-12
ESE	1.42E-10	6.28E-11	3.81E-11	1.92E-11	1.16E-11	7.81E-12	5.60E-12	4.20E-12	3.27E-12	2.61E-12	2.13E-12
SE	1.60E-10	7.10E-11	4.30E-11	2.18E-11	1.32E-11	8.83E-12	6.33E-12	4.75E-12	3.69E-12	2.95E-12	2.41E-12
SSE	2.42E-10	1.07E-10	6.50E-11	3.29E-11	1.99E-11	1.33E-11	9.55E-12	7.17E-12	5.58E-12	4.46E-12	3.64E-12

TABLE 2.3-327 (Sheet 3 of 3)
ANNUAL AVERAGE D/Q (m⁻²)
FOR EACH 22.5° SECTOR AT THE SEGMENTS (MILES) SHOWN AT THE TOP

SECTOR	.5-1	1-2	2-3	3-4	4-5	5-10	10-20	20-30	30-40	40-50
S	9.97E-09	3.83E-09	2.12E-09	9.54E-10	5.40E-10	2.08E-10	6.00E-11	2.38E-11	1.27E-11	7.86E-12
SSW	9.87E-09	3.04E-09	1.04E-09	7.45E-10	8.34E-10	3.37E-10	9.76E-11	3.87E-11	2.07E-11	1.28E-11
SW	9.64E-09	2.93E-09	9.92E-10	4.93E-10	2.97E-10	2.47E-10	1.02E-10	4.03E-11	2.15E-11	1.33E-11
WSW	2.07E-09	6.72E-10	2.39E-10	1.21E-10	7.21E-11	7.67E-11	3.38E-11	1.34E-11	7.16E-12	4.43E-12
W	7.16E-10	2.30E-10	8.00E-11	4.01E-11	2.38E-11	3.02E-11	1.37E-11	5.44E-12	2.91E-12	1.80E-12
WNW	1.06E-09	3.36E-10	1.17E-10	9.88E-11	1.16E-10	4.48E-11	1.30E-11	5.13E-12	2.74E-12	1.70E-12
NW	2.61E-09	7.09E-10	2.24E-10	1.68E-10	1.67E-10	6.44E-11	1.86E-11	7.38E-12	3.94E-12	2.44E-12
NNW	3.58E-09	1.00E-09	3.22E-10	2.47E-10	2.48E-10	9.54E-11	2.76E-11	1.09E-11	5.84E-12	3.62E-12
N	6.33E-09	1.72E-09	5.36E-10	2.58E-10	1.51E-10	8.66E-11	4.94E-11	1.96E-11	1.05E-11	6.47E-12
NNE	1.25E-08	3.15E-09	9.50E-10	4.51E-10	2.63E-10	1.64E-10	1.03E-10	4.06E-11	2.17E-11	1.34E-11
NE	9.71E-09	2.50E-09	8.08E-10	8.42E-10	6.26E-10	2.41E-10	6.97E-11	2.76E-11	1.48E-11	9.13E-12
ENE	6.53E-09	2.21E-09	1.22E-09	5.49E-10	3.11E-10	1.20E-10	3.46E-11	1.37E-11	7.32E-12	4.53E-12
E	4.92E-09	1.83E-09	9.41E-10	4.23E-10	2.39E-10	9.19E-11	2.66E-11	1.05E-11	5.63E-12	3.48E-12
ESE	4.26E-09	1.81E-09	7.09E-10	3.19E-10	1.80E-10	6.93E-11	2.01E-11	7.95E-12	4.24E-12	2.63E-12
SE	3.76E-09	1.92E-09	8.02E-10	3.60E-10	2.04E-10	7.83E-11	2.27E-11	8.98E-12	4.80E-12	2.97E-12
SSE	7.06E-09	3.06E-09	1.21E-09	5.44E-10	3.08E-10	1.18E-10	3.42E-11	1.36E-11	7.25E-12	4.49E-12

TABLE 2.3-328 (Sheet 1 of 2)
 χ/Q AND D/Q VALUES FOR NO DECAY, DECAY, DEPLETED AND UNDEPLETED, AT EACH RECEPTOR LOCATION

Receptor	Sector	Distance		X/Q	X/Q	X/Q	D/Q
		(miles)	(meters)	(sec/m ³) No Decay Undepleted	(sec/m ³) 2.26 Day Decay Undepleted	(sec/m ³) 8.00 Day Decay Depleted	
EAB	S	0.71	1145	1.10E-06	1.10E-06	1.10E-06	1.10E-08
EAB	SSW	1.03	1660	1.20E-06	1.20E-06	1.10E-06	5.90E-09
EAB	SW	0.78	1249	1.40E-06	1.40E-06	1.30E-06	9.80E-09
EAB	WSW	0.73	1177	3.40E-07	3.40E-07	3.10E-07	2.30E-09
EAB	W	0.59	949	1.10E-07	1.10E-07	1.00E-07	9.60E-10
EAB	WNW	0.53	855	1.60E-07	1.60E-07	1.40E-07	1.60E-09
EAB	NW	0.53	855	3.70E-07	3.70E-07	3.40E-07	4.20E-09
EAB	NNW	0.54	866	4.90E-07	4.90E-07	4.50E-07	5.60E-09
EAB	N	0.58	935	7.90E-07	7.90E-07	7.30E-07	9.10E-09
EAB	NNE	0.77	1244	1.40E-06	1.40E-06	1.30E-06	1.20E-08
EAB	NE	1.1	1769	7.00E-07	7.00E-07	6.60E-07	4.50E-09
EAB	ENE	0.78	1250	6.30E-07	6.20E-07	5.80E-07	6.40E-09
EAB	E	0.59	947	5.50E-07	5.50E-07	5.10E-07	7.10E-09
EAB	ESE	0.58	927	4.60E-07	4.60E-07	4.30E-07	6.30E-09
EAB	SE	0.58	927	4.80E-07	4.80E-07	4.40E-07	5.40E-09
EAB	SSE	0.58	932	7.70E-07	7.70E-07	7.10E-07	1.00E-08
GARDEN	S	4.91	7900	3.50E-07	3.30E-07	3.10E-07	4.40E-10
GARDEN	SSW	3.75	6039	4.00E-07	3.90E-07	3.80E-07	4.80E-10
GARDEN	SW	1.13	1817	1.10E-06	1.10E-06	1.00E-06	4.80E-09
GARDEN	WSW	1.11	1780	2.80E-07	2.80E-07	2.70E-07	1.10E-09
GARDEN	W	1.13	1813	8.20E-08	8.20E-08	7.80E-08	3.70E-10
GARDEN	WNW	0.75	1213	1.40E-07	1.40E-07	1.30E-07	1.10E-09
GARDEN	NW	0.68	1095	3.10E-07	3.10E-07	2.90E-07	3.10E-09
GARDEN	NNW	1.14	1831	2.70E-07	2.60E-07	2.50E-07	1.60E-09
GARDEN	N	1.47	2368	3.30E-07	3.20E-07	3.10E-07	1.60E-09
GARDEN	NNE	1.4	2246	7.00E-07	7.00E-07	6.60E-07	3.30E-09
GARDEN	NE	3.78	6079	1.10E-06	1.00E-06	1.00E-06	9.10E-10
GARDEN	ENE	3.48	5600	4.90E-07	4.60E-07	4.50E-07	5.40E-10
GARDEN	E	2.43	3911	6.60E-07	6.40E-07	6.20E-07	9.60E-10
GARDEN	ESE	2.76	4444	3.60E-07	3.40E-07	3.30E-07	5.40E-10
GARDEN	SE	2.38	3830	5.30E-07	5.20E-07	5.00E-07	8.60E-10
COW	SW	2.43	3907	5.30E-07	5.20E-07	5.10E-07	1.00E-09
COW	WSW	4.6	7409	8.50E-08	8.10E-08	8.10E-08	6.80E-11
COW	W	1.53	2457	7.10E-08	7.00E-08	6.90E-08	2.10E-10
COW	WNW	0.8	1286	1.40E-07	1.30E-07	1.30E-07	1.00E-09
COW	NW	0.78	1250	2.80E-07	2.80E-07	2.60E-07	2.60E-09
COW	NNW	1.36	2186	2.20E-07	2.20E-07	2.10E-07	1.10E-09
COW	N	2.89	4646	1.70E-07	1.60E-07	1.60E-07	3.80E-10

Attachment 02.03.05-02A
TVA Letter Dated: August 13, 2008
RAI Responses

Receptor	Sector	Distance		X/Q	X/Q	X/Q	D/Q
		(miles)	(meters)	(sec/m ³) No Decay Undepleted	(sec/m ³) 2.26 Day Decay Undepleted	(sec/m ³) 8.00 Day Decay Depleted	
COW	NNE	2.25	3622	4.30E-07	4.20E-07	4.00E-07	1.20E-09
COW	NE	4.3	6914	8.40E-07	7.90E-07	8.00E-07	6.90E-10
COW	ENE	3.88	6243	4.00E-07	3.80E-07	3.60E-07	4.30E-10
COW	E	2.35	3783	7.00E-07	6.80E-07	6.70E-07	1.00E-09
COW	ESE	3.79	6103	1.90E-07	1.80E-07	1.70E-07	2.60E-10
COW	SE	2.22	3568	6.20E-07	6.00E-07	5.90E-07	1.00E-09
GOAT	NW	2.37	3809	7.60E-08	7.50E-08	7.20E-08	2.40E-10
GOAT	NNE	2.61	4193	3.70E-07	3.60E-07	3.50E-07	8.40E-10
GOAT	NE	4.78	7686	7.00E-07	6.50E-07	6.50E-07	5.40E-10
GOAT	E	2.35	3785	7.00E-07	6.80E-07	6.70E-07	1.00E-09
GOAT	ESE	4.32	6958	1.50E-07	1.40E-07	1.30E-07	1.90E-10
GOAT	SE	4.47	7197	1.50E-07	1.50E-07	1.40E-07	2.00E-10
HOUSE	S	4.74	7634	3.70E-07	3.50E-07	3.30E-07	4.70E-10
HOUSE	SSW	3.51	5656	3.50E-07	3.40E-07	3.40E-07	5.10E-10
HOUSE	SW	1.81	2907	7.30E-07	7.20E-07	7.00E-07	1.90E-09
HOUSE	WSW	2.55	4101	1.60E-07	1.50E-07	1.50E-07	2.20E-10
HOUSE	W	1.44	2324	7.30E-08	7.20E-08	7.00E-08	2.30E-10
HOUSE	WNW	0.74	1187	1.40E-07	1.40E-07	1.30E-07	1.20E-09
HOUSE	NW	0.69	1113	3.10E-07	3.10E-07	2.80E-07	3.10E-09
HOUSE	NNW	0.7	1124	4.30E-07	4.20E-07	4.00E-07	4.20E-09
HOUSE	N	0.9	1454	5.50E-07	5.50E-07	5.10E-07	4.60E-09
HOUSE	NNE	1.19	1908	8.30E-07	8.30E-07	7.80E-07	4.80E-09
HOUSE	NE	4.42	7111	8.00E-07	7.50E-07	7.50E-07	6.40E-10
HOUSE	ENE	3.52	5667	4.80E-07	4.50E-07	4.40E-07	5.30E-10
HOUSE	E	2.16	3478	8.40E-07	8.20E-07	8.10E-07	1.30E-09
HOUSE	ESE	2.09	3363	6.40E-07	6.20E-07	6.10E-07	1.00E-09
HOUSE	SE	1.94	3120	8.20E-07	8.10E-07	8.00E-07	1.40E-09
HOUSE	SSE	4.82	7758	2.30E-07	2.10E-07	2.00E-07	2.60E-10

TABLE 2.3-329

DELETED

TABLE 2.3-330

DELETED

TABLE 2.3-331

DELETED