

January 15, 2010



Ross Altobelli, Town Planner
Town Hall
55 Main Street
Westford, MA 01886

RE: Peer Review Memo on December 28 Newport Materials Risk Assessment

Dear Ross:

Woodard & Curran (W&C) has completed a peer review of the revised "Quantitative Assessment of Potential Health Risks Due to Operation of the Proposed Newport Materials Asphalt Plant Westford, Massachusetts" dated December 28, 2009 (hereinafter "Final Risk Assessment Report") prepared by Cambridge Environmental, Inc. (CE). CE was retained by Newport Materials LLC (Newport) to conduct a health risk assessment to evaluate the potential human health risks associated with the emissions from the proposed asphalt plant to be located at 20 Commerce Way in Westford. This report addressed many of the review comments made by W&C in an October 26, 2009 memorandum. The major changes made in the Final Risk Assessment Report included: incorporating additional emission sources, calculating risks at the point of maximum impact for the evaluated Hazardous Air Pollutants (HAPs), and adding several additional compounds to the evaluation. However, the risk assessment only includes HAPs for which the US Environmental Protection Agency (EPA) Office of Air Quality Planning and Standards (OAQPS) has published toxicity values. Massachusetts Department of Environmental Protection (MassDEP) has published toxicity values for additional compounds that may be emitted by the proposed facility. W&C believes that these compounds should be included in the assessment so that the results are comprehensive with respect to evaluating potential risks to human health. As described in more detail below, W&C performed a brief analysis that included these additional chemicals and results remain generally consistent with those presented by CE in the risk assessment report. In addition, W&C performed a comparison of the estimated annual concentrations to MassDEP Ambient Air Limits (AALs), also presented below.

Summary of Revisions and Findings

Based on our review, W&C concludes that it is likely, as stated in the Final Risk Assessment Report, that background sources of many of the pollutants evaluated will remain more significant relative to those generated from the proposed asphalt plant, the nearby Fletcher Quarry, and the associated vehicle emissions. Below, W&C notes the key revisions to the modeling and risk assessment portions of the Final Risk Assessment Report; in addition, minor comments were incorporated into to the report.

Several of the W&C review comments that CE included in this final document pertain to the air dispersion modeling. Major air modeling changes include the following:

- Decrease of the dust control efficiency for unpaved roads from 95% to 90%;
- Centering of the MOBILE6 runs on the proposed Newport facility;
- Evaluation of NO₂ emissions and comparison to the proposed EPA 1-hr NO₂ rule and evaluation of acute respiratory irritation effects;
- Reporting of concentrations for the point of maximum impact; and,
- Inclusion of diesel particulate matter (DPM) and fugitive PM₁₀/PM_{2.5} emissions from the Fletcher Quarry and associated vehicular activity.



Major revisions to the risk assessment portion of the final report include:

- Assessment of the combined exposure from all sources related to the proposed asphalt plant, Fletcher Quarry, nearby Wood Chipping Operations, a nearby Concrete Plant, and associated vehicular traffic at the point of maximum exposure;
- Calculation of total risks for non-carcinogenic and carcinogenic compounds and comparison to standard USEPA risk management criteria¹;
- Addition of beryllium, hexavalent chromium, carbon disulfide, chloroethane, chloromethane, cumene, methylene chloride, styrene, dibenz(a,h)anthracene, tetrachloroethene, and phenol (however carcinogenic effects were not calculated for methylene chloride and tetrachloroethene);
- More complete evaluation of acute effects; and
- Cumulative analysis of particulate matter.

For the conservative assessment of risk, W&C remains concerned that some contaminants are not included due to CE's reliance on EPA's OAQPS toxicity values and therefore may not be comprehensive with respect to evaluation of potential risks to human health. To address this concern, W&C recalculated risks including additional contaminants with MassDEP toxicity values. Our calculations show risks slightly greater than those presented by CE: however, they do not exceed EPA or MassDEP guidelines. Therefore, W&C concludes that the small incremental risk from the proposed Newport Materials asphalt plant should not adversely affect public health.

General Comments on the Final Risk Assessment Report

W&C recognizes that substantial revisions have been made in the Final Risk Assessment Report based on suggestions made in our peer review memorandum dated October 26, 2009 and CE's response to our comments dated November 16, 2009. Our remaining concern regards the reliance on OAQPS toxicity values and excluding contaminants that have toxicity values published by MassDEP. Although it is acknowledged that it is standard practice for evaluation of HAPs within the USEPA framework to rely on OAQPS toxicity values, additional sources for toxicity information can be consulted and utilized. Therefore, W&C chose to recalculate risks including 17 additional compounds (16 polycyclic aromatic hydrocarbons [PAHs] and total chromium) that have MassDEP toxicity values. All remaining variables (concentrations and exposure assumptions) are the same as those used by CE. Table 1, "Risk Calculations Using OAQPS and MassDEP Hierarchy", presents the inputs for these calculations: pollutant, maximum concentration, toxicity values and their source (OAQPS or MassDEP), and the hazard quotient (HQ) and/or excess lifetime cancer risk (ELCR). In comparing our results to those from CE, the inclusion of the PAHs only slightly increases the cumulative carcinogenic risk. The cumulative noncarcinogenic risk (Hazard Index) does not increase. The following table compares both W&C's total risk estimates and CE's risk estimates for the proposed facility to the USEPA risk management criteria.

	NONCARCINOGENIC HAZARD QUOTIENT	EXCESS LIFETIME CANCER RISK
Woodard & Curran	0.08	5.8 x 10 ⁻⁷
Cambridge Environmental	0.08	4.8 x 10 ⁻⁷
USEPA Risk Management Criteria	1	1 x 10 ⁻⁶
Are criteria exceeded?	No	No

¹ As per numerous USEPA risk assessment guidance documents (see, for example, Risk Assessment Guidance for Superfund (RAGs), USEPA, 1989) and associated references, it is standard practice to compare (chronic) total non-cancer hazard quotients/indices (HQs or HIs) to a non-cancer limit of 1.0, and total excess lifetime cancer risks (ELCR) to a cancer risk limit of 1 X 10⁻⁶ or one excess cancer per million people exposed to proposed facility HAPs. Although in certain USEPA regulatory programs, such as CERCLA, it is permissible to compare ELCRs to a cancer risk range of 1 X 10⁻⁶ to 1 X 10⁻⁴, for ease of comparison, the more stringent end of the range, 1 X 10⁻⁶, is cited herein.



Our more conservative approach confirms CE's conclusion that incremental public health risks from the proposed facility are extremely low. The modeling upon which these conclusions relied included emissions from not only the operation of the proposed asphalt plant, but also include the following additional sources: Fletcher Quarry, nearby Wood Chipping Operations, a nearby Concrete Plant and vehicular traffic associated with plant, quarry and wood chipping operations. Accordingly, reference to "proposed facility" includes emissions associated with the additional sources noted above. The W&C results show that the incremental risks posed by the proposed facility are more than ten times below the USEPA risk management criteria. Therefore, it is concluded that the incremental risk from the proposed facility (excluding "background" sources) does not pose a significant risk to public health.

For further confirmation of CE's conclusion that public health risks from the proposed facility are extremely low, W&C compared the modeled maximum annual concentrations to MassDEP's Allowable Ambient Limits (AALs), which are health-based and therefore protective of public health. These comparisons are presented on Table 2, "Comparison of Maximum Annual Concentrations to Allowable Ambient Limits" (AALs). As this table shows, none of the modeled maximum annual concentrations exceeds AALs. In addition, Table 3 compares the modeled maximum annual concentrations for HAPs to the average annual background concentrations in Westford, Middlesex County and Massachusetts. This comparison further supports the conclusion, as stated in the Final Risk Assessment Report, that background sources of many of the pollutants evaluated will remain more significant relative to those generated from the proposed asphalt plant, the nearby Concrete Plant and Fletcher Quarry, the occasional Wood Chipping operations, and the associated vehicle emissions. Furthermore, review of the three sets of background concentrations presented on Table 3 reveals that there is a high degree of consistency between these data sets and that background concentrations in Westford are thus comparable to those in other locations throughout Massachusetts as well as Middlesex County.

Specific Comments on the Final Risk Assessment Report

Our comments are grouped into three topics: 1) Emission Factors, 2) Exposure Point Concentrations, and 3) Risk Assessment issues. Only technical comments are presented below; minor points (e.g., clarifications) are not included.

Topic 1: Emission Factors/Air Modeling

W&C's comment to revise dust control efficiency from unpaved roads from 95% to 90% was incorporated. CE included eleven additional compounds: beryllium, hexavalent chromium, carbon disulfide, chloroethane, chloromethane, cumene, methylene chloride, styrene, dibenz(a,h)anthracene, tetrachloroethene, and phenol.

W&C's comment to model idling truck emission rates using short-term emission rates for comparison to short term acute RfCs was incorporated. W&C's comment to center the MOBILE6 modeling analysis on the Newport facility site was incorporated.

The AERMOD modeling was conducted assuming that some of the sources operate for only selected hours of the week. Please indicate which sources were assumed to operate for selected time periods and justify these operating limits in the final report.

In TRC's Technical Memorandum (dated September 14, 2009) modeling of stationary on-site emission sources was conducted in order to compare the predicted impacts to the MassDEP's 24-hr Threshold Effects Exposure Limits (TELEs). In particular, attention has been focused on the predicted formaldehyde concentrations ($0.2676 \mu\text{g}/\text{m}^3$) that were close to the 24-hr TELE standard of $0.33 \mu\text{g}/\text{m}^3$. Although the MassDEP typically does not require that mobile sources or additional off-site sources be included in TELE compliance modeling for minor sources, it would be valid to include those additional sources in the risk assessment for comparison to the 24-hr formaldehyde TELE. Please explain this omission.



Topic 2: Exposure Point Concentrations

CE accepted many of our recommendations. Specifically, they modeled the combined impacts from all sources in the area and presented concentrations at the point of maximum impact; included vehicles from both the quarry and the proposed facility when modeling DPM; revised their assessment of acute respiratory effects; included a comparison of NO₂ concentrations to the proposed revision to EPA's National Ambient Air Quality Standard; and revised the PM₁₀/PM_{2.5} modeling and clearly summarized results.

Specific Comments

- 2-1. Table 1 in the report has incorrect concentrations for toluene, methylene chloride, styrene, and tetrachloroethylene. It appears to be due to toluene being out of alphabetical order.
- 2-3. The report states that "impacts from the facility" include impacts from the Newport facility modeled simultaneously with the adjacent quarry, wood-chipping operations, and concrete patch plant. This statement is accurate for a majority of the pollutants examined; however, not all the examined pollutants were modeled for all sources. This may be the result of a lack of available emission factors for some of the sources examined. Please clarify that "impacts from the facility" does not indicate that all examined pollutants were modeled for all sources.
- 2-4. Please indicate why the 1-hour maximum impacts from the proposed facility for DPM and formaldehyde, as indicated in Table 5, have decreased from the original draft risk assessment document. As additional sources have been included in the air dispersion modeling, these concentrations would be expected to increase, not decrease.
- 2-5. Please change the time-frame indicated in the report for the NO₂ background concentrations from "2006 and 2007" to "2005 and 2006" to agree with the actual background data presented in the modeling files.
- 2-6. Please provide justification as to why the 1-hr NO₂ concentrations, determined utilizing the Plume Volume Molar Ratio Method (PVMRM) option in AERMOD, were calculated using an NO₂/NO_x equilibrium value of 0.75, instead of the default value of 0.9.
- 2-7. The 1-hour maximum impact for formaldehyde in Table 5 is reported as 1.2 µg/m³. Please change this value to 1.28 µg/m³, to agree with the results in the AERMOD modeling files.
- 2-8. Please add a column to Table 6, indicating the rank of each modeled pollutant concentration for each averaging period (e.g., high-6th-high, high-8th-high, maximum).

Topic 3: Risk Assessment

The Final Risk Assessment Report incorporated many of our suggestions. Total (summed) risks for all sources at the point of maximum exposure are evaluated, thus the risks represent a maximally exposed individual. The PM₁₀ and PM_{2.5} presentation of predicted concentrations and comparison to EPA standards was revised.

Specific Comments

- 3-1. W&C agrees that the use of the California Office of Environmental Health Assessment value for acrolein is appropriate in this assessment; the justification for its use should be in a footnote.
- 3-2. The acute RfC for SO₂ has been reduced from 520 µg/m³ to 262 µg/m³; a fuller explanation of this revision would be helpful.



W&C hopes that the review of the Final Risk Assessment Report is useful to the Westford Planning Board and looks forward to presenting a summary of this review at the public meeting scheduled for February 1, 2010. Please feel free to contact Kelley Begin (978-557-8150) or Lisa Campe (781-251-0200) if you have questions regarding this review.

Sincerely,

WOODARD & CURRAN INC.

A handwritten signature in blue ink, appearing to read "Lisa J. Campe".

Lisa Campe, MPH, LSP
Vice President

A handwritten signature in blue ink, appearing to read "Kelley Begin".

Kelley Begin, P.E.
Project Manager

KB/cc
222567.01
Enclosure(s)

cc: Members of the Town of Westford Planning Board

Table 1
Risk Calculations using OAQPS/MassDEP Hierarchy

Chemical of Potential Concern (COPC)	Maximum Annual Concentrations ($\mu\text{g}/\text{m}^3$)	Chronic RfC ($\mu\text{g}/\text{m}^3$)	Source	Unit Risk Factor ($\text{m}^3/\mu\text{g}$)	Source	Maximum Location Hazard Index (HI)	Maximum Location ELCR
Benzene	1.28E-03	3.0E+01	OAQPS	7.8E-06	OAQPS	4.3E-05	4.3E-09
Bromomethane	6.58E-05	5.0E+00	OAQPS			1.3E-05	
Carbon Disulfide	9.50E-05	7.0E+02	OAQPS			1.4E-07	
Chloroethane	4.46E-06	1.0E+04	OAQPS			4.5E-10	
Chloromethane	1.13E-04	9.0E+01	OAQPS			1.3E-06	
Cumene	7.25E-04	4.0E+02	OAQPS			1.8E-06	
Ethylbenzene	1.90E-03	1.0E+03	OAQPS			1.9E-06	
Formaldehyde	6.31E-03	9.8E+00	OAQPS	5.5E-09	OAQPS	6.4E-04	1.5E-11
Hexane	1.34E-03	7.0E+02	OAQPS			1.9E-06	
Isooctane (2,2,4-trimethylpentane)	4.73E-05						
Methyl chloroform (1,1,1-Trichloroethane)	5.21E-05	1.0E+03	OAQPS			5.2E-08	
Methylene Chloride	2.12E-07	1.0E+03	OAQPS	4.7E-07	OAQPS	2.1E-10	4.3E-14
Styrene	5.08E-05	1.0E+03	OAQPS	5.7E-07	MassDEP	5.1E-08	1.2E-11
Tetrachloroethene	5.08E-05	2.7E+02	OAQPS	5.9E-06	OAQPS	1.9E-07	1.3E-10
Toluene	2.11E-03	5.0E+03	OAQPS			4.2E-07	
Xylene	3.39E-03	1.0E+02	OAQPS			3.4E-05	
2-Methylnaphthalene	3.87E-04	5.0E+01	MassDEP			7.7E-06	
Acenaphthene	5.96E-05	5.0E+01	MassDEP			1.2E-06	
Acenaphthylene	9.59E-05	5.0E+01	MassDEP			1.9E-06	
Anthracene	1.76E-05	5.0E+01	MassDEP			3.5E-07	
Benzo(a)anthracene	3.22E-06	5.0E+01	MassDEP	1.1E-04	OAQPS	6.4E-08	1.5E-10
Benzo(a)pyrene	3.03E-07	5.0E+01	MassDEP	1.1E-03	OAQPS	6.1E-09	1.4E-10
Benzo(b)fluoranthene	4.97E-06	5.0E+01	MassDEP	1.1E-04	OAQPS	9.9E-08	2.3E-10
Benzo(e)pyrene	1.15E-06						
Benzo(g,h,i)perylene	2.54E-07	5.0E+01	MassDEP			5.1E-09	
Benzo(k)fluoranthene	2.93E-07	5.0E+01	MassDEP	1.1E-04	OAQPS	5.9E-09	1.4E-11
Chrysene	1.62E-05	5.0E+01	MassDEP	1.1E-05	OAQPS	3.2E-07	7.6E-11
Dibenz(a,h)anthracene	4.86E-08	5.0E+01	MassDEP	1.2E-03	OAQPS	9.7E-10	2.5E-11
Fluoranthene	1.01E-05	5.0E+01	MassDEP			2.0E-07	
Fluorene	1.16E-04	5.0E+01	MassDEP			2.3E-06	
Indeno(1,2,3-cd)pyrene	6.24E-08	5.0E+01	MassDEP	1.1E-04	OAQPS	1.2E-09	2.9E-12
Naphthalene	8.67E-04	3.0E+00	OAQPS	3.4E-05	OAQPS	2.9E-04	1.3E-08
Perylene	3.27E-06						
Phenanthrene	3.13E-04	5.0E+01	MassDEP			6.3E-06	
Phenol	1.55E-04	2.0E+02	OAQPS			7.8E-07	
Pyrene	2.66E-05	5.0E+01	MassDEP			5.3E-07	
Total PCDD/PCDF (treated as 2378TCDD)	9.34E-09	4.0E-05	OAQPS	3.3E+01	OAQPS	2.3E-04	1.3E-07
Arsenic	1.46E-04	3.0E-02	OAQPS	4.3E-03	OAQPS	4.9E-03	2.7E-07
Beryllium	3.10E-05	2.0E-02	OAQPS	2.4E-03	OAQPS	1.6E-03	3.2E-08
Cadmium	2.15E-05	2.0E-02	OAQPS	1.8E-03	OAQPS	1.1E-03	1.7E-08
Chromium	4.34E-04	1.0E-01	MassDEP			4.3E-03	
Cobalt	3.00E-08	1.0E-01	OAQPS			3.0E-07	
Hexavalent chromium	4.89E-07	1.0E-01	OAQPS	1.2E-02	OAQPS	4.9E-06	2.5E-09
Lead	2.19E-04	1.5E+00	OAQPS			1.5E-04	
Manganese	2.15E-03	5.0E-02	OAQPS			4.3E-02	
Mercury	6.34E-05	3.0E-01	OAQPS			2.1E-04	
Nickel	5.25E-04	9.0E-02	OAQPS	4.8E-04	MassDEP	5.8E-03	1.1E-07
Phosphorus	1.26E-03	7.0E-02	OAQPS			1.8E-02	
Selenium	1.14E-04	2.0E+01	OAQPS			5.7E-06	
Diesel Particulate Matter (DPM)	1.70E-02	5.0E+00	OAQPS			3.4E-03	
1,3 Butadiene	4.13E-04	2.0E+00	OAQPS	3.0E-05	OAQPS	2.1E-04	5.3E-09
Acetaldehyde	1.90E-03	9.0E+00	OAQPS	2.2E-06	OAQPS	2.1E-04	1.8E-09
Acrolein	2.28E-04	3.5E-01	OEHA			6.5E-04	
TOTAL						8.0E-02	5.8E-07

Notes and Abbreviations:

- Maximum annual concentrations are AP42 data modeled by TRC.
 - Excess lifetime cancer risk (ELCR) was adjusted for exposure duration over a lifetime (30 years) = 0.4286
- OAQPS = United States Environmental Protection Agency (USEPA) Office of Air Quality Planning and Standards. Prioritized Chronic Dose-Response Values for Screening Risk Assessments, Table 1. June 2007. Available at <http://www.epa.gov/airtoxics/toxsource/chronicpriority.html>, accessed January 12, 2010.
- MassDEP = Massachusetts Department of Environmental Protection. MCP Numerical Standards Development Spreadsheets, MCP Toxicity.xls. December 2009. Available at <http://www.mass.gov/dep/service/compliance/riskasmt.htm>, accessed January 12, 2010.
- OEHA = California Office of Environmental Health Hazard Assessment Draft Chronic Reference Exposure Level (REL) for Acrolein. Acrolein Reference Exposure Levels DRAFT. December 2008. Available at http://www.oehha.ca.gov/air/toxic_contaminants/pdf_zip/acrolein_112508.pdf, accessed January 13, 2010.

Table 2
Comparison of Maximum Annual Concentrations to MassDEP
Allowable Ambient Limits (AALs)

Chemical of Potential Concern (COPC)	Maximum Annual Concentrations ($\mu\text{g}/\text{m}^3$)	AAL ($\mu\text{g}/\text{m}^3$)
Benzene	1.28E-03	1.20E-01
Bromomethane	6.58E-05	2.64E+00
Carbon Disulfide	9.50E-05	1.00E-01
Chloroethane	4.46E-06	3.59E+02
Chloromethane	1.13E-04	
Cumene	7.25E-04	
Ethylbenzene	1.90E-03	3.00E+02
Formaldehyde	6.31E-03	8.00E-02
Hexane	1.34E-03	4.76E+01
Isooctane (2,2,4-trimethylpentane)	4.73E-05	
Methyl chloroform (1,1,1-Trichloroethane)	5.21E-05	1.04E+03
Methylene Chloride	2.12E-07	2.40E-01
Styrene	5.08E-05	2.00E+00
Tetrachloroethene	5.08E-05	2.00E-02
Toluene	2.11E-03	2.00E+01
Xylene	3.39E-03	1.18E+01
2-Methylnaphthalene	3.87E-04	1.43E+01
Acenaphthene	5.96E-05	
Acenaphthylene	9.59E-05	
Anthracene	1.76E-05	
Benzo(a)anthracene	3.22E-06	
Benzo(a)pyrene	3.03E-07	
Benzo(b)fluoranthene	4.97E-06	
Benzo(e)pyrene	1.15E-06	
Benzo(g,h,i)perylene	2.54E-07	
Benzo(k)fluoranthene	2.93E-07	
Chrysene	1.62E-05	
Dibenz(a,h)anthracene	4.86E-08	
Fluoranthene	1.01E-05	
Fluorene	1.16E-04	
Indeno(1,2,3-cd)pyrene	6.24E-08	
Naphthalene	8.67E-04	1.43E+01
Perylene	3.27E-06	
Phenanthrene	3.13E-04	
Phenol	1.55E-04	5.23E+01
Pyrene	2.66E-05	
Total PCDD/PCDF (treated as 2378TCDD)	9.34E-09	
Arsenic	1.46E-04	2.00E-04
Beryllium	3.10E-05	4.00E-04
Cadmium	2.15E-05	1.00E-03
Chromium	4.34E-04	6.80E-01
Cobalt	3.00E-08	
Hexavalent chromium	4.89E-07	1.00E-04
Lead	2.19E-04	7.00E-02
Manganese	2.15E-03	
Mercury	6.34E-05	1.00E-02
Nickel	5.25E-04	1.80E-01
Phosphorus	1.26E-03	
Selenium	1.14E-04	5.40E-01
Diesel Particulate Matter (DPM)	1.70E-02	
1,3 Butadiene	4.13E-04	3.00E-03
Acetaldehyde	1.90E-03	5.00E-01
Acrolein	2.28E-04	

Notes and Abbreviations:

1. Maximum annual concentrations are AP42 data modeled by TRC.
2. Allowable Ambient Limits (AALs) obtained from Massachusetts Department of Environmental Protection (MassDEP) Revised Air Guidelines Memorandum, December 6, 1995. Available at <http://www.mass.gov/dep/air/aallist.pdf>.

Table 3
Comparison of Maximum Annual Concentrations to Background Concentrations
in Westford, Middlesex County, and Massachusetts

Chemical of Potential Concern (COPC)	Maximum Annual Concentrations ($\mu\text{g}/\text{m}^3$)	Westford NATA 2002 Annual Concentrations ($\mu\text{g}/\text{m}^3$)	Middlesex County NATA 2002 Annual Concentrations ($\mu\text{g}/\text{m}^3$)	Massachusetts NATA 2002 Annual Concentrations ($\mu\text{g}/\text{m}^3$)
Benzene	1.28E-03	1.64E+00	1.87E+00	1.46E+00
Bromomethane	6.58E-05	3.50E-02	3.50E-02	3.50E-02
Carbon Disulfide	9.50E-05	1.37E-03	2.78E-03	2.45E-03
Chloroethane	4.46E-06	3.52E-03	7.39E-03	6.59E-03
Chloromethane	1.13E-04	1.21E+00	1.21E+00	1.21E+00
Cumene	7.25E-04	5.72E-04	1.23E-03	1.12E-03
Ethylbenzene	1.90E-03	2.76E-01	3.62E-01	2.97E-01
Formaldehyde	6.31E-03	2.43E+00	2.53E+00	1.97E+00
Hexane	1.34E-03	2.20E-01	2.89E-01	2.42E-01
Isooctane (2,2,4-trimethylpentane)	4.73E-05	7.75E-01	9.32E-01	7.94E-01
Methyl chloroform (1,1,1-Trichloroethane)	5.21E-05	2.54E-01	2.85E-01	2.66E-01
Methylene Chloride	2.12E-07	4.07E-01	4.99E-01	3.73E-01
Styrene	5.08E-05	2.38E-02	3.39E-02	3.16E-02
Tetrachloroethene	5.08E-05	2.13E-01	2.36E-01	1.44E-01
Toluene	2.11E-03	3.50E+00	4.18E+00	3.23E+00
Xylene	3.39E-03	1.24E+00	1.69E+00	1.43E+00
2-Methylnaphthalene	3.87E-04			
Acenaphthene	5.96E-05			
Acenaphthylene	9.59E-05			
Anthracene	1.76E-05			
Benzo(a)anthracene	3.22E-06			
Benzo(a)pyrene	3.03E-07			
Benzo(b)fluoranthene	4.97E-06			
Benzo(e)pyrene	1.15E-06			
Benzo(g,h,i)perylene	2.54E-07			
Benzo(k)fluoranthene	2.93E-07			
Chrysene	1.62E-05			
Dibenz(a,h)anthracene	4.86E-08			
Fluoranthene	1.01E-05			
Fluorene	1.16E-04			
Indeno(1,2,3-cd)pyrene	6.24E-08			
Naphthalene	8.67E-04	1.72E-02	6.24E-02	5.79E-02
Perylene	3.27E-06			
Phenanthrene	3.13E-04			
Phenol	1.55E-04	5.46E-02	5.36E-02	5.65E-02
Pyrene	2.66E-05			
Total PCDD/PCDF (treated as 2378TCDD)	9.34E-09			
Arsenic	1.46E-04	7.47E-04	8.08E-04	5.56E-04
Beryllium	3.10E-05	8.79E-05	1.22E-04	9.09E-05
Cadmium	2.15E-05	8.66E-05	1.21E-04	1.18E-04
Chromium	4.34E-04	6.68E-04	7.50E-04	5.75E-04
Cobalt	3.00E-08	9.66E-06	3.01E-05	1.83E-05
Hexavalent chromium	4.89E-07			
Lead	2.19E-04	3.07E-03	2.75E-03	2.26E-03
Manganese	2.15E-03	1.16E-03	1.22E-03	8.71E-04
Mercury	6.34E-05	7.24E-05	1.43E-04	1.17E-04
Nickel	5.25E-04	2.39E-04	3.90E-03	2.61E-03
Phosphorus	1.26E-03	5.72E-06	1.08E-05	1.06E-05
Selenium	1.14E-04	1.97E-04	3.66E-04	3.20E-04
Diesel Particulate Matter (DPM)	1.70E-02	7.61E-01	9.01E-01	8.48E-01
1,3 Butadiene	4.13E-04	1.13E-01	1.35E-01	1.03E-01
Acetaldehyde	1.90E-03	2.13E+00	2.19E+00	1.73E+00
Acrolein	2.28E-04	9.84E-02	1.10E-01	9.27E-02

Notes and Abbreviations:

1. Maximum annual concentrations are AP42 data modeled by TRC.
2. Background concentrations are EPA's estimated average concentrations for Westford, Middlesex County, and Massachusetts.