

APPENDIX II
CALCULATIONS

Chester Water Authority
Reference doses and carcinogenic potency slope factors.

Contaminant	Oral RfD mg/kg/d	Inhaled RfD mg/kg/d	Oral Slope Factor kg•d/mg	Inhaled Slope Factor kg•d/mg
TETRACHLOROETHENE	1.00E-02		5.20E-02	2.03E-03
TOTAL TRIHALOMETHANES	1.00E-02		6.10E-03	8.05E-02
CARBON TETRACHLORIDE	7.00E-04	5.71E-04	1.30E-01	5.25E-02
FLUORIDE	6.00E-02			
NITRITE	1.00E-01			

Note: The toxicity criteria for chloroform were used to estimate risk from trihalomethanes

Chester Water Authority
Adult resident drinking water ingestion.

Concentration	mg/L	CW
Ingestion rate	L/d	2 IR
Exposure frequency	dy	350 EF
Exposure duration	y	24 ED
Body weight	kg	70 BW
Averaging time carc.	d	25550 AT
Averaging time ncarc.	d	8760 AT

Intake (mg/kg-day) =

$$\frac{CW \times IR \times EF \times ED}{BW \times AT}$$

Contaminant	RME Conc. mg/L	Lifetime Average Daily Dose mg/kg/d	Chronic Daily Dose mg/kg/d	Lifetime Cancer Risk	Systemic Hazard Quotient
TETRACHLOROETHENE	--	--	--	--	--
TOTAL TRIHALOMETHANES	5.60E-02	2.19E-05	1.53E-03	1.34E-07	1.53E-01
CARBON TETRACHLORIDE	--	--	--	--	--
FLUORIDE	--	--	--	--	--
NITRITE	8.80E-01	3.44E-04	2.41E-02	--	2.41E-01
TOTAL RISK FROM ALL SOURCES (1989-ED = 1 YEAR)				1.34E-07	3.95E-01
TETRACHLOROETHENE	--	--	--	--	--
TOTAL TRIHALOMETHANES	7.20E-02	2.82E-05	1.97E-03	1.72E-07	1.97E-01
CARBON TETRACHLORIDE	8.00E-04	3.13E-07	2.19E-05	4.07E-08	3.13E-02
FLUORIDE	--	--	--	--	--
NITRITE	--	--	--	--	--
TOTAL RISK FROM ALL SOURCES (1990-ED = 1 YEAR)				2.13E-07	2.29E-01
TETRACHLOROETHENE	--	--	--	--	--
TOTAL TRIHALOMETHANES	7.80E-02	3.05E-05	2.14E-03	1.86E-07	2.14E-01
CARBON TETRACHLORIDE	--	--	--	--	--
FLUORIDE	9.20E-01	3.60E-04	2.52E-02	--	4.20E-01
NITRITE	--	--	--	--	--
TOTAL RISK FROM ALL SOURCES (1991-ED = 1 YEAR)				1.86E-07	6.34E-01
TOTAL RISK WITHOUT FLUORIDE				1.86E-07	2.14E-01
TETRACHLOROETHENE	--	--	--	--	--
TOTAL TRIHALOMETHANES	8.30E-02	3.25E-05	2.27E-03	1.96E-07	2.27E-01
CARBON TETRACHLORIDE	--	--	--	--	--
FLUORIDE	--	--	--	--	--
NITRITE	--	--	--	--	--
TOTAL RISK FROM ALL SOURCES (1992-ED = 1 YEAR)				1.96E-07	2.27E-01
TETRACHLOROETHENE	1.00E-03	3.91E-07	2.74E-05	2.04E-08	2.74E-03
TOTAL TRIHALOMETHANES	6.60E-02	2.58E-05	1.81E-03	1.58E-07	1.81E-01
CARBON TETRACHLORIDE	--	--	--	--	--
FLUORIDE	1.00E+00	3.91E-04	2.74E-02	--	4.57E-01
NITRITE	2.01E-01	7.87E-05	5.51E-03	--	5.51E-02
TOTAL RISK FROM ALL SOURCES (1993-ED = 1 YEAR)				1.78E-07	6.95E-01
TOTAL RISK WITHOUT FLUORIDE				1.78E-07	2.39E-01
TETRACHLOROETHENE	1.00E-03	9.39E-06	2.74E-05	4.88E-07	2.74E-03
TOTAL TRIHALOMETHANES	6.60E-02	6.20E-04	1.81E-03	3.78E-06	1.81E-01
CARBON TETRACHLORIDE	--	--	--	--	--
FLUORIDE	1.00E+00	9.39E-03	2.74E-02	--	4.57E-01
NITRITE	2.01E-01	1.89E-03	5.51E-03	--	5.51E-02
TOTAL RISK FROM ALL SOURCES (1993-ED = 30 YEARS)				4.27E-06	6.95E-01
TOTAL RISK WITHOUT FLUORIDE				4.27E-06	2.39E-01

Chester Water Authority
Child resident drinking water ingestion.

Concentration	mg/L	CW
Ingestion rate	L/d	1 IR
Exposure frequency	d/y	350 EF
Exposure duration	y	6 ED
Body weight	kg	15 BW
Averaging time carc.	d	25550 AT
Averaging time ncarc.	d	2190 AT

$$\text{Intake (mg/kg-day)} = \frac{\text{CW} \times \text{IR} \times \text{EF} \times \text{ED}}{\text{BW} \times \text{AT}}$$

Contaminant	RME Conc. mg/L	Lifetime Average Daily Dose mg/kg/d	Chronic Daily Dose mg/kg/d	Lifetime Cancer Risk	Systemic Hazard Quotient
TETRACHLOROETHENE	--	--	--	--	--
TOTAL TRIHALOMETHANES	5.60E-02	5.11E-05	3.58E-03	3.12E-07	3.58E-01
CARBON TETRACHLORIDE	--	--	--	--	--
FLUORIDE	--	--	--	--	--
NITRITE	8.80E-01	8.04E-04	5.63E-02	--	5.63E-01
TOTAL RISK FROM ALL SOURCES (1989-ED=1 YEAR)				3.12E-07	9.21E-01
TETRACHLOROETHENE	--	--	--	--	--
TOTAL TRIHALOMETHANES	7.20E-02	6.58E-05	4.60E-03	4.01E-07	4.60E-01
CARBON TETRACHLORIDE	8.00E-04	7.31E-07	5.11E-05	9.50E-08	7.31E-02
FLUORIDE	--	--	--	--	--
NITRITE	--	--	--	--	--
TOTAL RISK FROM ALL SOURCES (1990-ED=1 YEAR)				4.96E-07	5.33E-01
TETRACHLOROETHENE	--	--	--	--	--
TOTAL TRIHALOMETHANES	7.80E-02	7.12E-05	4.99E-03	4.35E-07	4.99E-01
CARBON TETRACHLORIDE	--	--	--	--	--
FLUORIDE	9.20E-01	8.40E-04	5.88E-02	--	9.80E-01
NITRITE	--	--	--	--	--
TOTAL RISK FROM ALL SOURCES (1991-ED=1 YEAR)				4.35E-07	1.48E+00
TOTAL RISK WITHOUT FLUORIDE				4.35E-07	4.99E-01
TETRACHLOROETHENE	--	--	--	--	--
TOTAL TRIHALOMETHANES	8.30E-02	7.58E-05	5.31E-03	4.62E-07	5.31E-01
CARBON TETRACHLORIDE	--	--	--	--	--
FLUORIDE	--	--	--	--	--
NITRITE	--	--	--	--	--
TOTAL RISK FROM ALL SOURCES (1992-ED=1 YEAR)				4.62E-07	5.31E-01
TETRACHLOROETHENE	1.00E-03	9.13E-07	6.39E-05	4.75E-08	6.39E-03
TOTAL TRIHALOMETHANES	6.60E-02	6.03E-05	4.22E-03	3.68E-07	4.22E-01
CARBON TETRACHLORIDE	--	--	--	--	--
FLUORIDE	1.00E+00	9.13E-04	6.39E-02	--	1.07E+00
NITRITE	2.01E-01	1.84E-04	1.28E-02	--	1.28E-01
TOTAL RISK FROM ALL SOURCES (1993-ED=1 YEAR)				4.15E-07	1.82E+00
TOTAL RISK WITHOUT FLUORIDE				4.15E-07	5.57E-01
TETRACHLOROETHENE	1.00E-03	5.48E-06	6.39E-05	2.85E-07	6.39E-03
TOTAL TRIHALOMETHANES	6.60E-02	3.62E-04	4.22E-03	2.21E-06	4.22E-01
CARBON TETRACHLORIDE	--	--	--	--	--
FLUORIDE	1.00E+00	5.48E-03	6.39E-02	--	1.07E+00
NITRITE	2.01E-01	1.10E-03	1.28E-02	--	1.28E-01
TOTAL RISK FROM ALL SOURCES (1993-ED=30 YEARS)				2.49E-08	1.62E+00
TOTAL RISK WITHOUT FLUORIDE				2.49E-08	5.57E-01

L-phase i.e. CO2	cm/h	20
G-phase i.e. H2O	cm/h	3000
Water visc. at 20C	cp	1.002
Water visc. at 48C	cp	0.596
Shower temp	K	318
Droplet diameter	mm	1
Drop time	s	2
Shower flow rate	L/min	20
Shower stall volume	m3	2.90E+00
Shower duration	mh	1.20E+01
Air exchange rate	mh-1	0.0166667 (RANGE: .5 TO 1.5 PER HOUR)

Contaminant	RME Conc. mg/L	Mol. Wt. g/mol	Henry's Constant atm-m ³ /mol	K _{OW} c/w/h	K _{OC} c/w/h	Overall Trans. Coef. KL c/w/h	Trans. Coef. K _{OL} c/w/h	Conc. in H ₂ O mg/L	VOC Gen. Rate g/m ³ -min	Air Conc. in Shower mg/m ³	Avg. Air Conc. in Shower mg/m ³
TETRACHLOROETHENE		1.88E+02	2.58E-02	1.03E+01	8.88E+02	1.02E+01	1.37E+01	--	--	--	--
TOTAL TRIHALOMETHANES	5.80E-02	1.18E+02	2.81E-03	1.22E+01	1.17E+03	1.12E+01	1.50E+01	2.20E-02	1.52E-01	1.85E+00	8.52E-01
CARBON TETRACHLORIDE		1.54E+02	2.41E-02	1.07E+01	1.03E+03	1.08E+01	1.42E+01	--	--	--	--
FLUORIDE											
NITRITE	6.80E-01										
1989-ED= 1 YEAR											
TETRACHLOROETHENE		1.88E+02	2.58E-02	1.03E+01	8.88E+02	1.02E+01	1.37E+01	--	--	--	--
TOTAL TRIHALOMETHANES	7.20E-02	1.18E+02	2.81E-03	1.22E+01	1.17E+03	1.12E+01	1.50E+01	2.83E-02	1.85E-01	2.12E+00	1.10E+00
CARBON TETRACHLORIDE	8.00E-04	1.54E+02	2.41E-02	1.07E+01	1.03E+03	1.08E+01	1.42E+01	3.01E-04	2.08E-03	2.28E-02	1.17E-02
FLUORIDE											
NITRITE											
1990-ED= 1 YEAR											
TETRACHLOROETHENE		1.88E+02	2.58E-02	1.03E+01	8.88E+02	1.02E+01	1.37E+01	--	--	--	--
TOTAL TRIHALOMETHANES	7.80E-02	1.18E+02	2.81E-03	1.22E+01	1.17E+03	1.12E+01	1.50E+01	3.08E-02	2.11E-01	2.30E+00	1.18E+00
CARBON TETRACHLORIDE		1.54E+02	2.41E-02	1.07E+01	1.03E+03	1.08E+01	1.42E+01	--	--	--	--
FLUORIDE	9.20E-01										
NITRITE											
1991-ED=1 YEAR											
TETRACHLOROETHENE		1.88E+02	2.58E-02	1.03E+01	8.88E+02	1.02E+01	1.37E+01	--	--	--	--
TOTAL TRIHALOMETHANES	8.20E-02	1.18E+02	2.81E-03	1.22E+01	1.17E+03	1.12E+01	1.50E+01	3.28E-02	2.25E-01	2.44E+00	1.26E+00
CARBON TETRACHLORIDE		1.54E+02	2.41E-02	1.07E+01	1.03E+03	1.08E+01	1.42E+01	--	--	--	--
FLUORIDE											
NITRITE											
1992-ED= 1 YEAR											
TETRACHLOROETHENE	1.00E-03	1.88E+02	2.58E-02	1.03E+01	8.88E+02	1.02E+01	1.37E+01	3.88E-04	2.52E-03	2.74E-02	1.42E-02
TOTAL TRIHALOMETHANES	8.80E-02	1.18E+02	2.81E-03	1.22E+01	1.17E+03	1.12E+01	1.50E+01	2.58E-02	1.78E-01	1.84E+00	1.00E+00
CARBON TETRACHLORIDE		1.54E+02	2.41E-02	1.07E+01	1.03E+03	1.08E+01	1.42E+01	--	--	--	--
FLUORIDE	1.00E+00										
NITRITE	2.01E-01										
1993-ED= 1 YEAR											
TETRACHLOROETHENE	1.00E-03	1.88E+02	2.58E-02	1.03E+01	8.88E+02	1.02E+01	1.37E+01	3.88E-04	2.52E-03	2.74E-02	1.42E-02
TOTAL TRIHALOMETHANES	8.80E-02	1.18E+02	2.81E-03	1.22E+01	1.17E+03	1.12E+01	1.50E+01	2.58E-02	1.78E-01	1.84E+00	1.00E+00
CARBON TETRACHLORIDE		1.54E+02	2.41E-02	1.07E+01	1.03E+03	1.08E+01	1.42E+01	--	--	--	--
FLUORIDE	1.00E+00										
NITRITE	2.01E-01										
1993-ED= 30 YEAR											

Chester Water Authority
Adult resident showering inhalation.

Concentration	mg/m3	CA
Inhalation rate	m3/min	0.0138889 IR
Exposure frequency	d/y	350 EF
Exposure duration	y	24 ED
Body weight	kg	70 BW
Averaging time carc.	d	25550 AT
Averaging time ncarc.	d	8760 AT
Shower duration	min/d	12 ET

$$\text{Intake (mg/kg-day)} = \frac{\text{CA} \times \text{IR} \times \text{ET} \times \text{EF} \times \text{ED}}{\text{BW} \times \text{AT}}$$

Contaminant	RME Conc. mg/m3	Lifetime Average Daily Dose mg/kg/d	Chronic Daily Dose mg/kg/d	Lifetime Cancer Risk	Systemic Hazard Quotient
TETRACHLOROETHENE	--	--	--	--	--
TOTAL TRIHALOMETHANES	8.52E-01	2.78E-05	1.95E-03	2.24E-06	--
CARBON TETRACHLORIDE	--	--	--	--	--
FLUORIDE	NA	--	--	--	--
NITRITE	NA	--	--	--	--
TOTAL RISK FROM ALL SOURCES (1989-ED=1 YEAR)				2.24E-06	--
TETRACHLOROETHENE	--	--	--	--	--
TOTAL TRIHALOMETHANES	1.10E+00	3.57E-05	2.50E-03	2.88E-06	--
CARBON TETRACHLORIDE	1.17E-02	3.81E-07	2.66E-05	2.00E-08	4.67E-02
FLUORIDE	NA	--	--	--	--
NITRITE	NA	--	--	--	--
TOTAL RISK FROM ALL SOURCES (1990-ED=1 YEAR)				2.90E-06	4.67E-02
TETRACHLOROETHENE	--	--	--	--	--
TOTAL TRIHALOMETHANES	1.19E+00	3.87E-05	2.71E-03	3.12E-06	--
CARBON TETRACHLORIDE	--	--	--	--	--
FLUORIDE	NA	--	--	--	--
NITRITE	NA	--	--	--	--
TOTAL RISK FROM ALL SOURCES (1991-ED=1 YEAR)				3.12E-06	--
TETRACHLOROETHENE	--	--	--	--	--
TOTAL TRIHALOMETHANES	1.26E+00	4.12E-05	2.88E-03	3.32E-06	--
CARBON TETRACHLORIDE	--	--	--	--	--
FLUORIDE	NA	--	--	--	--
NITRITE	NA	--	--	--	--
TOTAL RISK FROM ALL SOURCES (1992-ED=1 YEAR)				3.32E-06	--
TETRACHLOROETHENE	1.42E-02	4.62E-07	3.24E-05	9.38E-10	--
TOTAL TRIHALOMETHANES	1.00E+00	3.28E-05	2.29E-03	2.64E-06	--
CARBON TETRACHLORIDE	--	--	--	--	--
FLUORIDE	NA	--	--	--	--
NITRITE	NA	--	--	--	--
TOTAL RISK FROM ALL SOURCES (1993-ED=1 YEAR)				2.64E-06	--
TETRACHLOROETHENE	1.42E-02	1.11E-05	3.24E-05	2.25E-08	--
TOTAL TRIHALOMETHANES	1.00E+00	7.86E-04	2.29E-03	6.33E-05	--
CARBON TETRACHLORIDE	--	--	--	--	--
FLUORIDE	NA	--	--	--	--
NITRITE	NA	--	--	--	--
TOTAL RISK FROM ALL SOURCES (1993-ED=30 YEARS)				6.33E-05	--

NA--Not Applicable

Chester Water Authority
Child resident drinking water dermal contact.

Concentration	mg/L	CW
Surface area	cm ²	7200 SA
Exposure frequency	d/y	350 EF
Exposure duration	y	6 ED
Body weight	kg	15 BW
Averaging time carc.	d	25550 AT
Averaging time ncarc.	d	2190 AT
Bath duration	h/d	0.33 ET
Conversion Factor	l/cm ³	1.00E-03 CF
Dermal Permeability Constant (chemical specific)	cm ² /hr	PC

$$\text{Absorbed Dose (mg/kg-day)} = \frac{\text{CW} \times \text{SA} \times \text{PC} \times \text{ET} \times \text{EF} \times \text{ED} \times \text{CF}}{\text{BW} \times \text{AT}}$$

Contaminant	RME Conc. mg/L	Lifetime Average Daily Dose mg/kg/d	Chronic Daily Dose mg/kg/d	Lifetime Cancer Risk	Systemic Hazard Quotient	Dermal Permeab. Coeff. cm/hr
TETRACHLOROETHENE	---	---	---	---	---	4.00E-01
TOTAL TRIHALOMETHANES	5.60E-02	1.22E-05	8.51E-04	7.41E-08	8.51E-02	1.00E-01
CARBON TETRACHLORIDE	---	---	---	---	---	2.20E-02
FLUORIDE	NA	---	---	---	---	---
NITRITE	NA	---	---	---	---	---
TOTAL RISK FROM ALL SOURCES (1989-ED = 1 YEAR)				7.41E-08	8.51E-02	---
TETRACHLOROETHENE	---	---	---	---	---	4.00E-01
TOTAL TRIHALOMETHANES	7.20E-02	1.56E-05	1.09E-03	9.53E-08	1.09E-01	1.00E-01
CARBON TETRACHLORIDE	8.00E-04	3.82E-08	2.67E-06	4.96E-09	3.82E-03	2.20E-02
FLUORIDE	NA	---	---	---	---	---
NITRITE	NA	---	---	---	---	---
TOTAL RISK FROM ALL SOURCES (1990-ED = 1 YEAR)				1.00E-07	1.13E-01	---
TETRACHLOROETHENE	---	---	---	---	---	4.00E-01
TOTAL TRIHALOMETHANES	7.80E-02	1.69E-05	1.18E-03	1.03E-07	1.18E-01	1.00E-01
CARBON TETRACHLORIDE	---	---	---	---	---	2.20E-02
FLUORIDE	NA	---	---	---	---	---
NITRITE	NA	---	---	---	---	---
TOTAL RISK FROM ALL SOURCES (1991-ED = 1 YEAR)				1.03E-07	1.18E-01	---
TETRACHLOROETHENE	---	---	---	---	---	4.00E-01
TOTAL TRIHALOMETHANES	8.30E-02	1.80E-05	1.26E-03	1.10E-07	1.26E-01	1.00E-01
CARBON TETRACHLORIDE	---	---	---	---	---	2.20E-02
FLUORIDE	NA	---	---	---	---	---
NITRITE	NA	---	---	---	---	---
TOTAL RISK FROM ALL SOURCES (1992-ED = 1 YEAR)				1.10E-07	1.26E-01	---
TETRACHLOROETHENE	1.00E-03	8.68E-07	6.08E-05	4.51E-08	6.08E-03	4.00E-01
TOTAL TRIHALOMETHANES	6.60E-02	1.43E-05	1.00E-03	8.74E-08	1.00E-01	1.00E-01
CARBON TETRACHLORIDE	---	---	---	---	---	2.20E-02
FLUORIDE	NA	---	---	---	---	---
NITRITE	NA	---	---	---	---	---
TOTAL RISK FROM ALL SOURCES (1993-ED = 1 YEAR)				1.32E-07	1.06E-01	---
TETRACHLOROETHENE	1.00E-03	5.21E-06	6.08E-05	2.71E-07	6.08E-03	4.00E-01
TOTAL TRIHALOMETHANES	6.60E-02	8.59E-05	1.00E-03	5.24E-07	1.00E-01	1.00E-01
CARBON TETRACHLORIDE	---	---	---	---	---	2.20E-02
FLUORIDE	NA	---	---	---	---	---
NITRITE	NA	---	---	---	---	---
TOTAL RISK FROM ALL SOURCES (1994-ED = 30 YEARS)				7.95E-07	1.06E-01	---

NA-Not Applicable

Philadelphia Suburban Water Company
Reference doses and carcinogenic potency slope factors.

Contaminant	Oral RfD mg/kg/d	Inhaled RfD mg/kg/d	Oral Slope Factor kg•d/mg	Inhaled Slope Factor kg•d/mg
TOTAL TRIHALOMETHANES	1.00E-02		6.10E-03	8.05E-02

Note: The toxicity criteria for chloroform were used to estimate risk from trihalomethanes

Philadelphia Suburban Water Company
Adult resident drinking water ingestion.

Concentration	mg/L	CW
Ingestion rate	L/d	2 IR
Exposure frequency	d/y	350 EF
Exposure duration	y	24 ED
Body weight	kg	70 BW
Averaging time carc.	d	25550 AT
Averaging time ncarc.	d	8760 AT

Intake (mg/kg-day) =

$$\frac{CW \times IR \times EF \times ED}{BW \times AT}$$

Contaminant	RME Conc. mg/L	Lifetime Average Daily Dose mg/kg/d	Chronic Daily Dose mg/kg/d	Lifetime Cancer Risk	Systemic Hazard Quotient
TOTAL TRIHALOMETHANES	4.75E-02	1.86E-05	1.30E-03	1.13E-07	1.30E-01
TOTAL RISK FROM ALL SOURCES (1989-ED= 1 YEAR)				1.13E-07	1.30E-01
TOTAL TRIHALOMETHANES	6.31E-02	2.47E-05	1.73E-03	1.51E-07	1.73E-01
TOTAL RISK FROM ALL SOURCES (1990-ED= 1 YEAR)				1.51E-07	1.73E-01
TOTAL TRIHALOMETHANES	4.07E-02	1.59E-05	1.12E-03	9.72E-08	1.12E-01
TOTAL RISK FROM ALL SOURCES (1991-ED= 1 YEAR)				9.72E-08	1.12E-01
TOTAL TRIHALOMETHANES	3.64E-02	1.42E-05	9.97E-04	8.69E-08	9.97E-02
TOTAL RISK FROM ALL SOURCES (1992-ED= 1 YEAR)				8.69E-08	9.97E-02
TOTAL TRIHALOMETHANES	9.80E-02	3.84E-05	2.68E-03	2.34E-07	2.68E-01
TOTAL RISK FROM ALL SOURCES (1993-ED= 1 YEAR)				2.34E-07	2.68E-01
TOTAL TRIHALOMETHANES	9.80E-02	9.21E-04	2.68E-03	5.62E-06	2.68E-01
TOTAL RISK FROM ALL SOURCES (1993-ED= 30 YEARS)				5.62E-06	2.68E-01

Philadelphia Suburban Water Company
Child resident drinking water ingestion.

Concentration	mg/L	CW
Ingestion rate	L/d	1 IR
Exposure frequency	d/y	350 EF
Exposure duration	y	6 ED
Body weight	kg	15 BW
Averaging time carc.	d	25550 AT
Averaging time ncarc.	d	2190 AT

$$\text{Intake (mg/kg-day)} = \frac{\text{CW} \times \text{IR} \times \text{EF} \times \text{ED}}{\text{BW} \times \text{AT}}$$

Contaminant	RME Conc. mg/L	Lifetime Average Daily Dose mg/kg/d	Chronic Daily Dose mg/kg/d	Lifetime Cancer Risk	Systemic Hazard Quotient
TOTAL TRIHALOMETHANES	4.75E-02	4.34E-05	3.04E-03	2.65E-07	3.04E-01
TOTAL RISK FROM ALL SOURCES (1989-ED= 1 YEAR)				2.65E-07	3.04E-01
TOTAL TRIHALOMETHANES	6.31E-02	5.76E-05	4.03E-03	3.52E-07	4.03E-01
TOTAL RISK FROM ALL SOURCES (1990-ED= 1 YEAR)				3.52E-07	4.03E-01
TOTAL TRIHALOMETHANES	4.07E-02	3.72E-05	2.60E-03	2.27E-07	2.60E-01
TOTAL RISK FROM ALL SOURCES (1991-ED= 1 YEAR)				2.27E-07	2.60E-01
TOTAL TRIHALOMETHANES	3.64E-02	3.32E-05	2.33E-03	2.03E-07	2.33E-01
TOTAL RISK FROM ALL SOURCES (1992-ED= 1 YEAR)				2.03E-07	2.33E-01
TOTAL TRIHALOMETHANES	9.80E-02	8.95E-05	6.26E-03	5.46E-07	6.26E-01
TOTAL RISK FROM ALL SOURCES (1993-ED= 1 YEAR)				5.46E-07	6.26E-01
TOTAL TRIHALOMETHANES	9.80E-02	5.37E-04	6.26E-03	3.28E-06	6.26E-01
TOTAL RISK FROM ALL SOURCES (1993-ED= 30 YEARS)				3.28E-06	6.26E-01

Philadelphia Suburban Water Company
Adult residents showering exposure concentrations.

L-phase L.C. CO ₂	cm/h	20
G-phase L.C. H ₂ O	cm/h	3000
Water Visc. at 20C	cp	1.002
Water Visc. at 45C	cp	0.566
Shower temp	K	318
Droplet diameter	mm	1
Drop time	s	2
Shower flow rate	L/min	20
Shower stall volume	m ³	2.80E+00
Shower duration	min	1.20E+01
Air exchange rate	min ⁻¹	0.0188867 RANGE: .5 TO 1.5 PER HOUR

Constituent	RME Conc. mg/L	Mol. Wt. g/mol	Henry's Constant atm-m ³ /mol	K _D cm/h	K _G cm/h	Overall Trans. Coeff. K _L cm/h	Temp-adj. Trans. Coeff. K _{OL} cm/h	Conc. leaving H ₂ O C _{OW} mg/L	VOC Gas-Phase Rate \$ mg/m ³ -s	Air Conc. at Shower Exit mg/m ³	Avg. Air Conc. in Shower mg/m ³
TOTAL TRIHALOMETHANES 1989-ED-1 YEAR	4.75E-02	1.19E+02	2.87E-03	1.22E+01	1.17E+03	1.12E+01	1.50E+01	1.87E-02	1.28E-01	1.40E+00	7.24E-01
TOTAL TRIHALOMETHANES 1990-ED-1 YEAR	6.31E-02	1.19E+02	2.87E-03	1.22E+01	1.17E+03	1.12E+01	1.50E+01	2.48E-02	1.71E-01	1.88E+00	9.81E-01
TOTAL TRIHALOMETHANES 1991-ED-1 YEAR	4.07E-02	1.19E+02	2.87E-03	1.22E+01	1.17E+03	1.12E+01	1.50E+01	1.80E-02	1.10E-01	1.20E+00	6.20E-01
TOTAL TRIHALOMETHANES 1989-ED-1 YEAR	3.84E-02	1.19E+02	2.87E-03	1.22E+01	1.17E+03	1.12E+01	1.50E+01	1.43E-02	9.87E-02	1.07E+00	5.55E-01
TOTAL TRIHALOMETHANES 1989-ED-1 YEAR	8.80E-02	8.30E+01	8.18E-02	1.87E+01	1.80E+03	1.87E+01	2.23E+01	5.14E-02	3.55E-01	3.88E+00	1.99E+01
TOTAL TRIHALOMETHANES 1989-ED-20 YEARS	8.80E-02	1.19E+02	2.87E-03	1.22E+01	1.17E+03	1.12E+01	1.50E+01	3.85E-02	2.68E-01	2.89E+00	1.48E+00

Philadelphia Suburban Water Company
Adult resident showering inhalation.

Concentration	mg/m3	CA
Inhalation rate	m3/min	0.0138889 IR
Exposure frequency	d/y	350 EF
Exposure duration	y	6 ED
Body weight	kg	70 BW
Averaging time carc.	d	25550 AT
Averaging time ncarc.	d	2190 AT
Shower duration	min/d	12 ET

$$\text{Intake (mg/kg-day)} = \frac{\text{CA} \times \text{IR} \times \text{ET} \times \text{EF} \times \text{ED}}{\text{BW} \times \text{AT}}$$

Contaminant	RME Conc. mg/m3	Lifetime Average Daily Dose mg/kg/d	Chronic Daily Dose mg/kg/d	Lifetime Cancer Risk	Systemic Hazard Quotient
TOTAL TRIHALOMETHANES	7.24E-01	2.36E-05	1.65E-03	1.90E-06	--
TOTAL RISK FROM ALL SOURCES (1989-ED= 1 YEAR)				1.90E-06	--
TOTAL TRIHALOMETHANES	9.61E-01	3.14E-05	2.19E-03	2.52E-06	--
TOTAL RISK FROM ALL SOURCES (1990-ED= 1 YEAR)				2.52E-06	--
TOTAL TRIHALOMETHANES	6.20E-01	2.02E-05	1.42E-03	1.63E-06	--
TOTAL RISK FROM ALL SOURCES (1991-ED= 1 YEAR)				1.63E-06	--
TOTAL TRIHALOMETHANES	5.55E-01	1.81E-05	1.27E-03	1.46E-06	--
TOTAL RISK FROM ALL SOURCES (1992-ED= 1 YEAR)				1.46E-06	--
TOTAL TRIHALOMETHANES	1.49E+00	4.87E-05	3.41E-03	3.92E-06	--
TOTAL RISK FROM ALL SOURCES (1993-ED= 1 YEAR)				3.92E-06	--
TOTAL TRIHALOMETHANES	1.49E+00	1.17E-03	3.41E-03	9.41E-05	--
TOTAL RISK FROM ALL SOURCES (1993-ED= 30 YEARS)				9.41E-05	--

Philadelphia Suburban Water Company
Child resident drinking water dermal contact

Concentration	mg/L	CW
Surface area	cm ²	7200 SA
Exposure frequency	d/y	350 EF
Exposure duration	y	6 ED
Body weight	kg	15 BW
Averaging time carc.	d	25550 AT
Averaging time ncarc.	d	2190 AT
Bath duration	h/d	0.33 ET
Conversion Factor	l/cm ³	1.00E-03 CF
Dermal Permeability Constant (chemical specific)	cm/hr	PC

Absorbed Dose (mg/kg-day) =

$$\frac{CW \times SA \times PC \times ET \times EF \times ED \times CF}{BW \times AT}$$

Contaminant	RME Conc. mg/L	Lifetime Average Daily Dose mg/kg/d	Chronic Daily Dose mg/kg/d	Lifetime Cancer Risk	Systemic Hazard Quotient	Dermal Permeab. Coeff. cm/h
TOTAL TRIHALOMETHANES	4.75E-02	1.03E-05	7.21E-04	6.29E-08	7.21E-02	1.00E-01
TOTAL RISK FROM ALL SOURCES (1989-ED= 1 YEAR)				6.29E-08	7.21E-02	
TOTAL TRIHALOMETHANES	6.31E-02	1.37E-05	9.58E-04	8.35E-08	9.58E-02	1.00E-01
TOTAL RISK FROM ALL SOURCES (1990-ED= 1 YEAR)				8.35E-08	9.58E-02	
TOTAL TRIHALOMETHANES	4.07E-02	8.83E-06	6.18E-04	5.39E-08	6.18E-02	1.00E-01
TOTAL RISK FROM ALL SOURCES (1991-ED= 1 YEAR)				5.39E-08	6.18E-02	
TOTAL TRIHALOMETHANES	3.64E-02	7.90E-06	5.53E-04	4.82E-08	5.53E-02	1.00E-01
TOTAL RISK FROM ALL SOURCES (1992-ED= 1 YEAR)				4.82E-08	5.53E-02	
TOTAL TRIHALOMETHANES	9.80E-02	2.13E-05	1.49E-03	1.30E-07	1.49E-01	1.00E-01
TOTAL RISK FROM ALL SOURCES (1993-ED= 1 YEAR)				1.30E-07	1.49E-01	
TOTAL TRIHALOMETHANES	9.80E-02	1.28E-04	1.49E-03	7.78E-07	1.49E-01	1.00E-01
TOTAL RISK FROM ALL SOURCES (1993-ED= 30 YEARS)				7.78E-07	1.49E-01	

Philadelphia Water Department
Reference doses and carcinogenic potency slope factors.

Contaminant	Oral RfD mg/kg/d	Inhaled RfD mg/kg/d	Oral Slope Factor kg•d/mg	Inhaled Slope Factor kg•d/mg
CARBON TETRACHLORIDE	7.00E-04	5.71E-04	1.30E-01	5.25E-02
TOTAL TRIHALOMETHANES	1.00E-02		6.10E-03	8.05E-02
FLUORIDE	6.00E-02			

Note: The toxicity criteria for chloroform were used to estimate risk from trihalomethanes

Philadelphia Water Department
Adult resident drinking water ingestion.

Concentration	mg/L	CW
Ingestion rate	L/d	2 IR
Exposure frequency	d/y	350 EF
Exposure duration	y	24 ED
Body weight	kg	70 BW
Averaging time carc.	d	25550 AT
Averaging time ncarc.	d	8760 AT

$$\text{Intake (mg/kg-day)} = \frac{\text{CW} \times \text{IR} \times \text{EF} \times \text{ED}}{\text{BW} \times \text{AT}}$$

Contaminant	RME Conc. mg/L	Lifetime Average Daily Dose mg/kg/d	Chronic Daily Dose mg/kg/d	Lifetime Cancer Risk	Systemic Hazard Quotient
CARBON TETRACHLORIDE	--	--	--	--	--
TOTAL TRIHALOMETHANES	6.83E-02	2.67E-05	1.87E-03	1.83E-07	1.87E-01
FLUORIDE	1.00E+00	3.91E-04	2.74E-02	--	4.57E-01
Total Risk from All Sources (1989) - ED = 1 Year				1.83E-07	6.44E-01
Total Risk without Fluoride				1.83E-07	1.87E-01
CARBON TETRACHLORIDE	5.00E-04	1.96E-07	1.37E-05	2.54E-08	1.96E-02
TOTAL TRIHALOMETHANES	7.15E-02	2.80E-05	1.96E-03	1.71E-07	1.96E-01
FLUORIDE	1.01E+00	3.95E-04	2.77E-02	--	4.61E-01
Total Risk from All Sources - 1990 (ED = 1 Year)				1.96E-07	6.77E-01
Total Risk without Fluoride				1.96E-07	2.15E-01
CARBON TETRACHLORIDE	3.00E-04	1.17E-07	8.22E-06	1.53E-08	1.17E-02
TOTAL TRIHALOMETHANES	7.61E-02	2.98E-05	2.08E-03	1.82E-07	2.08E-01
FLUORIDE	1.01E+00	3.95E-04	2.77E-02	--	4.61E-01
Total Risk from All Sources - 1991 (ED = 1 Year)				1.97E-07	6.81E-01
Total Risk without Fluoride				1.97E-07	2.20E-01
CARBON TETRACHLORIDE	--	--	--	--	--
TOTAL TRIHALOMETHANES	5.89E-02	2.31E-05	1.61E-03	1.41E-07	1.61E-01
FLUORIDE	1.00E+00	3.91E-04	2.74E-02	--	4.57E-01
Total Risk from All Sources - 1992 (ED = 1 Year)				1.41E-07	6.18E-01
Total Risk without Fluoride				1.41E-07	1.61E-01
CARBON TETRACHLORIDE	3.00E-04	1.17E-07	8.22E-06	1.53E-08	1.17E-02
TOTAL TRIHALOMETHANES	8.33E-02	3.26E-05	2.28E-03	1.99E-07	2.28E-01
FLUORIDE	9.80E-01	3.84E-04	2.68E-02	--	4.47E-01
Total Risk from All Sources - 1993 (ED = 1 Year)				2.14E-07	6.87E-01
Total Risk without Fluoride				2.14E-07	2.40E-01
CARBON TETRACHLORIDE	3.00E-04	2.82E-06	8.22E-06	3.66E-07	1.17E-02
TOTAL TRIHALOMETHANES	8.33E-02	7.82E-04	2.28E-03	4.77E-06	2.28E-01
FLUORIDE	9.80E-01	9.21E-03	2.68E-02	--	4.47E-01
Total Risk from All Sources - 1993 (ED = 30 Year)				5.14E-06	6.87E-01
Total Risk without Fluoride				5.14E-06	2.40E-01

Philadelphia Water Department
Child resident drinking water ingestion.

Concentration	mg/L	CW
Ingestion rate	L/d	1 IR
Exposure frequency	d/y	350 EF
Exposure duration	y	6 ED
Body weight	kg	15 BW
Averaging time carc.	d	25550 AT
Averaging time ncarc.	d	2190 AT

$$\text{Intake (mg/kg-day)} = \frac{\text{CW} \times \text{IR} \times \text{EF} \times \text{ED}}{\text{BW} \times \text{AT}}$$

Contaminant	RME Conc. mg/L	Lifetime Average Daily Dose mg/kg/d	Chronic Daily Dose mg/kg/d	Lifetime Cancer Risk	Systemic Hazard Quotient
CARBON TETRACHLORIDE	--	--	--	--	--
TOTAL TRIHALOMETHANES	6.83E-02	6.24E-05	4.37E-03	3.80E-07	4.37E-01
FLUORIDE	1.00E+00	9.13E-04	6.39E-02	--	1.07E+00
Total Risk from All Sources-- 1989 (ED=1year)				3.80E-07	1.50E+00
Total Risk without Fluoride				3.80E-07	4.37E-01
CARBON TETRACHLORIDE	5.00E-04	4.57E-07	3.20E-05	5.94E-08	4.57E-02
TOTAL TRIHALOMETHANES	7.15E-02	6.53E-05	4.57E-03	3.98E-07	4.57E-01
FLUORIDE	1.01E+00	9.22E-04	6.46E-02	--	1.08E+00
Total Risk from All Sources-- 1990 (ED = 1 Year)				4.58E-07	1.58E+00
Total Risk without Fluoride				4.58E-07	5.03E-01
CARBON TETRACHLORIDE	3.00E-04	2.74E-07	1.92E-05	3.58E-08	2.74E-02
TOTAL TRIHALOMETHANES	7.61E-02	6.95E-05	4.86E-03	4.24E-07	4.86E-01
FLUORIDE	1.01E+00	9.22E-04	6.46E-02	--	1.08E+00
Total Risk from All Sources-- 1991 (ED = 1 Year)				4.60E-07	1.59E+00
Total Risk without Fluoride				4.60E-07	5.14E-01
CARBON TETRACHLORIDE	--	--	--	--	--
TOTAL TRIHALOMETHANES	5.89E-02	5.38E-05	3.77E-03	3.28E-07	3.77E-01
FLUORIDE	1.00E+00	9.13E-04	6.39E-02	--	1.07E+00
Total Risk from All Sources-- 1992 (ED = 1 Year)				3.28E-07	1.44E+00
Total Risk without Fluoride				3.28E-07	3.77E-01
CARBON TETRACHLORIDE	3.00E-04	2.74E-07	1.92E-05	3.58E-08	2.74E-02
TOTAL TRIHALOMETHANES	8.33E-02	7.61E-05	5.33E-03	4.64E-07	5.33E-01
FLUORIDE	9.80E-01	8.95E-04	6.26E-02	--	1.04E+00
Total Risk from All Sources-- 1993 (ED = 1 Year)				5.00E-07	1.60E+00
Total Risk without Fluoride				5.00E-07	5.60E-01
CARBON TETRACHLORIDE	3.00E-04	1.64E-06	1.92E-05	2.14E-07	2.74E-02
TOTAL TRIHALOMETHANES	8.33E-02	4.58E-04	5.33E-03	2.78E-06	5.33E-01
FLUORIDE	9.80E-01	5.37E-03	6.26E-02	--	1.04E+00
Total Risk from All Sources-- 1993 (ED = 30 Year)				3.00E-06	1.60E+00
Total Risk without Fluoride				3.00E-06	5.60E-01

Philadelphia Water Department
Adult resident showering exposure concentrations.

L-phase L.C. CO ₂	cmh	30
Q-phase L.C. H ₂ O	cmh	3000
Water temp. at 30C	cc	1.008
Water temp. at 40C	cc	0.988
Shower temp	K	318
Orator diameter	m	1
Orator area	m ²	2
Shower flow rate	L/min	30
Shower stall volume	m ³	2.80E+00
Shower duration	min	1.20E+01
Air exchange rate	hr ⁻¹	0.0188887 (RANGE: .5 TO 1.5 PER HOUR)

Contaminant	Rate Conc. mg/L	Mol. Wt. g/mol	Henry's Coeff. atm-cm ³ /mol	kg m ³ /hr	kg m ³ /hr	Orator Trans. Coeff. kg m ³ /hr	Trans. Coeff. kg m ³ /hr	Cont. leaving H ₂ O Conc. mg/L	VOC Exposure Rate g/hr-m ³	Air Conc. at Shower End mg/m ³	Avg. Air Conc. in Shower mg/m ³
CARBON TETRACHLORIDE	---	1.94E+02	2.41E-02	1.07E+01	1.08E+08	1.08E+01	1.48E+01	---	---	---	---
TOTAL TRIHALOMETHANES	8.30E-02	1.18E+02	2.81E-03	1.22E+01	1.17E+03	1.12E+01	1.30E+01	2.88E-02	1.88E-01	2.01E+00	1.04E+00
1800ED=1 year	1.00E+00 na										
CARBON TETRACHLORIDE	5.00E-04	1.94E+02	2.41E-02	1.07E+01	1.08E+08	1.08E+01	1.48E+01	1.88E-04	1.30E-03	1.41E-02	7.30E-03
TOTAL TRIHALOMETHANES	7.18E-02	1.18E+02	2.81E-03	1.22E+01	1.17E+03	1.12E+01	1.30E+01	2.81E-02	1.84E-01	2.11E+00	1.08E+00
1800ED=1 year	1.01E+00 na										
CARBON TETRACHLORIDE	3.00E-04	1.94E+02	2.41E-02	1.07E+01	1.08E+08	1.08E+01	1.48E+01	1.12E-04	7.78E-04	8.47E-03	4.38E-03
TOTAL TRIHALOMETHANES	7.81E-02	1.18E+02	2.81E-03	1.22E+01	1.17E+03	1.12E+01	1.30E+01	2.88E-02	2.08E-01	2.34E+00	1.18E+00
1800ED=1 year	1.01E+00 na										
CARBON TETRACHLORIDE	---	1.94E+02	2.41E-02	1.07E+01	1.08E+08	1.08E+01	1.48E+01	---	---	---	---
TOTAL TRIHALOMETHANES	8.88E-02	1.18E+02	2.81E-03	1.22E+01	1.17E+03	1.12E+01	1.30E+01	2.31E-02	1.88E-01	1.72E+00	8.88E-01
1800ED=1 year	1.00E+00 na										
CARBON TETRACHLORIDE	3.00E-04	1.94E+02	2.41E-02	1.07E+01	1.08E+08	1.08E+01	1.48E+01	1.12E-04	7.78E-04	8.47E-03	4.38E-03
TOTAL TRIHALOMETHANES	8.33E-02	1.18E+02	2.81E-03	1.22E+01	1.17E+03	1.12E+01	1.30E+01	3.27E-02	2.38E-01	2.48E+00	1.27E+00
1800ED=1 year	8.80E-01 na										
CARBON TETRACHLORIDE	3.00E-04	1.94E+02	2.41E-02	1.07E+01	1.08E+08	1.08E+01	1.48E+01	1.12E-04	7.78E-04	8.47E-03	4.38E-03
TOTAL TRIHALOMETHANES	8.33E-02	1.18E+02	2.81E-03	1.22E+01	1.17E+03	1.12E+01	1.30E+01	3.27E-02	2.38E-01	2.48E+00	1.27E+00
1800ED=30 year	8.80E-01 na										

na=not applicable

Philadelphia Water Department
Adult resident showering inhalation.

Concentration	mg/m3	CA
Inhalation rate	m3/min	0.013889 IR
Exposure frequency	d/y	350 EF
Exposure duration	y	24 ED
Body weight	kg	70 BW
Averaging time carc.	d	25550 AT
Averaging time ncarc.	d	8760 AT
Shower duration	min/d	12 ET

$$\text{Intake (mg/kg-day)} = \frac{\text{CA} \times \text{IR} \times \text{ET} \times \text{EF} \times \text{ED}}{\text{BW} \times \text{AT}}$$

Contaminant	RME Conc. mg/m3	Lifetime Average Daily Dose mg/kg/d	Chronic Daily Dose mg/kg/d	Lifetime Cancer Risk	Systemic Hazard Quotient
CARBON TETRACHLORIDE	--	--	--	--	--
TOTAL TRIHALOMETHANES	1.04E+00	3.39E-05	2.37E-03	2.73E-06	--
FLUORIDE	na				
Total Risk from All Sources - 1989 (ED = 1 Year)				2.73E-06	--
CARBON TETRACHLORIDE	7.30E-03	2.38E-07	1.67E-05	1.24E-08	2.92E-02
TOTAL TRIHALOMETHANES	1.09E+00	3.55E-05	2.48E-03	2.86E-06	--
FLUORIDE	na				
Total Risk from All Sources - 1990 (ED = 1 Year)				2.87E-06	2.92E-02
CARBON TETRACHLORIDE	4.38E-03	1.43E-07	9.99E-06	7.42E-09	1.75E-02
TOTAL TRIHALOMETHANES	1.16E+00	3.78E-05	2.64E-03	3.04E-06	--
FLUORIDE	na				
Total Risk from All Sources - 1991 (ED = 1 Year)				3.05E-06	1.75E-02
CARBON TETRACHLORIDE	--	--	--	--	--
TOTAL TRIHALOMETHANES	8.96E-01	2.92E-05	2.05E-03	2.35E-06	--
FLUORIDE	na				
Total Risk from All Sources - 1992 (ED = 1 Year)				2.35E-06	--
CARBON TETRACHLORIDE	4.38E-03	1.43E-07	9.99E-06	7.42E-09	1.75E-02
TOTAL TRIHALOMETHANES	1.27E+00	4.13E-05	2.89E-03	3.33E-06	--
FLUORIDE	na				
Total Risk from All Sources - 1993 (ED = 1 Year)				3.34E-06	1.75E-02
CARBON TETRACHLORIDE	4.38E-03	3.43E-06	9.99E-06	1.78E-07	1.75E-02
TOTAL TRIHALOMETHANES	1.27E+00	9.92E-04	2.89E-03	7.99E-05	--
FLUORIDE	na				
Total Risk from All Sources - 1993 (ED = 30 Year)				8.00E-06	1.75E-02

na - not applicable

Philadelphia Water Department
Child resident drinking water dermal contact

Concentration	mg/L	CW
Surface area	cm ²	7200 SA
Exposure frequency	d/y	350 EF
Exposure duration	y	6 ED
Body weight	kg	15 BW
Averaging time carc.	d	25550 AT
Averaging time ncarc.	d	2190 AT
Bath duration	h/d	0.33 ET
Conversion Factor	l/cm ³	1.00E-03 CF
Dermal Permeability Constant (chemical specific)	cm/hr	PC

$$\text{Absorbed Dose (mg/kg-day)} = \frac{\text{CW} \times \text{SA} \times \text{PC} \times \text{ET} \times \text{EF} \times \text{ED} \times \text{CF}}{\text{BW} \times \text{AT}}$$

Contaminant	RME Conc. mg/L	Lifetime Average Daily Dose mg/kg/d	Chronic Daily Dose mg/kg/d	Lifetime Cancer Risk	Systemic Hazard Quotient	Dermal Permeab. Coeff. cm/h
CARBON TETRACHLORIDE	--	--	--	--	--	2.20E-02
TOTAL TRIHALOMETHANES	6.83E-02	1.48E-05	1.04E-03	9.04E-08	1.04E-01	1.00E-01
FLUORIDE	1.00E+00 na					
Total Risk from All Sources - 1989 (ED = 1 Year)				9.04E-08	1.04E-01	
CARBON TETRACHLORIDE	5.00E-04	2.39E-08	1.67E-06	3.10E-09	2.39E-03	2.20E-02
TOTAL TRIHALOMETHANES	7.15E-02	1.55E-05	1.09E-03	9.46E-08	1.09E-01	1.00E-01
FLUORIDE	1.01E+00 na					
Total Risk from All Sources - 1990 (ED = 1 Year)				9.77E-08	1.11E-01	
CARBON TETRACHLORIDE	3.00E-04	1.43E-08	1.00E-06	1.86E-09	1.43E-03	2.20E-02
TOTAL TRIHALOMETHANES	7.61E-02	1.65E-05	1.16E-03	1.01E-07	1.16E-01	1.00E-01
FLUORIDE	1.01E+00 na					
Total Risk from All Sources - 1991 (ED = 1 Year)				1.03E-07	1.17E-01	
CARBON TETRACHLORIDE	--	--	--	--	--	2.20E-02
TOTAL TRIHALOMETHANES	5.89E-02	1.28E-05	8.95E-04	7.80E-08	8.95E-02	1.00E-01
FLUORIDE	1.00E+00 na					
Total Risk from All Sources - 1992 (ED = 1 Year)				7.80E-08	8.95E-02	
CARBON TETRACHLORIDE	3.00E-04	1.43E-08	1.00E-06	1.86E-09	1.43E-03	2.20E-02
TOTAL TRIHALOMETHANES	8.33E-02	1.81E-05	1.27E-03	1.10E-07	1.27E-01	1.00E-01
FLUORIDE	9.80E-01 na					
Total Risk from All Sources - 1993 (ED = 1 Year)				1.12E-07	1.26E-01	
CARBON TETRACHLORIDE	3.00E-04	8.59E-08	1.00E-06	1.12E-08	1.43E-03	2.20E-02
TOTAL TRIHALOMETHANES	8.33E-02	1.08E-04	1.27E-03	6.62E-07	1.27E-01	1.00E-01
FLUORIDE	9.80E-01 na					
Total Risk from All Sources - 1993 (ED = 30 Year)				6.73E-07	1.26E-01	

na—not applicable

Coatesville Water Authority
Reference doses and carcinogenic potency slope factors.

Contaminant	Oral RfD mg/kg/d	Inhaled RfD mg/kg/d	Oral Slope Factor kg·d/mg	Inhaled Slope Factor kg·d/mg
TOTAL TRIHALOMETHANES	1.00E-02		6.10E-03	8.05E-02

Note: The toxicity criteria for chloroform were used to estimate risk from trihalomethanes

Coatesville Water Authority
Child resident drinking water ingestion.

Concentration	mg/L	CW
Ingestion rate	L/d	1 IR
Exposure frequency	d/y	350 EF
Exposure duration	y	6 ED
Body weight	kg	15 BW
Averaging time carc.	d	25550 AT
Averaging time ncarc.	d	2190 AT

$$\text{Intake (mg/kg-day)} = \frac{\text{CW} \times \text{IR} \times \text{EF} \times \text{ED}}{\text{BW} \times \text{AT}}$$

Contaminant	RME Conc. mg/L	Lifetime Average Daily Dose mg/kg/d	Chronic Daily Dose mg/kg/d	Lifetime Cancer Risk	Systemic Hazard Quotient
TOTAL TRIHALOMETHANES	8.62E-02	4.72E-04	5.51E-03	2.88E-06	5.51E-01
Total				2.88E-06	5.51E-01

Cosco Water Authority
Adult resident showering exposure concentrations.

L-phase L.C. CO2	cmh	20
G-phase L.C. H2O	cmh	3000
Water Visc. @ 20C	cp	1.002
Water Visc. @ 40C	cp	0.656
Shower temp	K	318
Droplet diameter	mm	1
Drop time	s	2
Shower flow rate	L/min	20
Shower stall volume	m3	2.30E+01
Shower duration	min	1.30E+01
Air exchange rate	ach-1	0.016667 (RANGE: 3 TO 1.5 PSR HOUR)

Compound	Phase Conc. mg/L	Max. TRP mg/d	Henry's Constant atm-cm3/mol	W	Rp cm/h	Direct Trans. Coeff. m3	Temp.-adj. Trans. Coeff. m3	Conc. Involg H2O mg/L	VOC Conc. Ratio B	Air Conc. at 25°C mg/m3	Avg. Air Conc. in Shower mg/m3
TOTAL TRIHALOMETHANES	8.80E-01	1.18E+01	2.57E-05	1.22E+01	1.17E+01	1.12E+01	1.80E+01	3.85E-01	2.88E-01	2.88E+00	1.48E+00

Coatesville Water Authority
Adult resident showering inhalation.

Concentration	mg/m3	CA
Inhalation rate	m3/min	0.0138889 IR
Exposure frequency	d/y	350 EF
Exposure duration	y	24 ED
Body weight	kg	70 BW
Averaging time carc.	d	25550 AT
Averaging time ncarc.	d	8760 AT
Shower duration	min/d	12 ET

$$\text{Intake (mg/kg-day)} = \frac{\text{CA} \times \text{IR} \times \text{ET} \times \text{EF} \times \text{ED}}{\text{BW} \times \text{AT}}$$

Contaminant	RME Conc. mg/m3	Lifetime Average Daily Dose mg/kg/d	Chronic Daily Dose mg/kg/d	Lifetime Cancer Risk	Systemic Hazard Quotient
TOTAL TRIHALOMETHANES	1.49E+00	1.17E-03	3.41E-03	9.41E-05	--
Total				9.41E-05	--

Costeasville Water Authority
Adult resident showering inhalation.

Concentration	mg/m3	CA
Inhalation rate	m3/min	0.0138889 IR
Exposure frequency	d/y	350 EF
Exposure duration	y	24 ED
Body weight	kg	70 BW
Averaging time carc.	d	25550 AT
Averaging time ncarc.	d	8760 AT
Shower duration	min/d	12 ET

$$\text{Intake (mg/kg-day)} = \frac{\text{CA} \times \text{IR} \times \text{ET} \times \text{EF} \times \text{ED}}{\text{BW} \times \text{AT}}$$

Contaminant	RME Conc. mg/m3	Lifetime Average Daily Dose mg/kg/d	Chronic Daily Dose mg/kg/d	Lifetime Cancer Risk	Systemic Hazard Quotient
TOTAL TRIHALOMETHANES	1.49E+00	1.17E-03	3.41E-03	9.41E-05	--
Total				9.41E-05	--

Costeaville Water Authority
Child resident drinking water dermal contact

Concentration	mg/L	CW
Surface area	cm ²	7200 SA
Exposure frequency	d/y	350 EF
Exposure duration	y	8 ED
Body weight	kg	15 BW
Averaging time carc.	d	25550 AT
Averaging time ncarc.	d	2190 AT
Bath duration	h/d	0.33 ET
Conversion Factor	l/cm ³	1.00E-03 CF
Dermal Permeability Constant (chemical specific)	cm/hr	PC

$$\text{Absorbed Dose (mg/kg-day)} = \frac{\text{CW} \times \text{SA} \times \text{PC} \times \text{ET} \times \text{EF} \times \text{ED} \times \text{CF}}{\text{BW} \times \text{AT}}$$

Contaminant	RME Conc. mg/L	Lifetime Average Daily Dose mg/kg/d	Chronic Daily Dose mg/kg/d	Lifetime Cancer Risk	Systemic Hazard Quotient	Dermal Permeab. Coeff. cm/h
TOTAL TRIHALOMETHANES	8.62E-02	1.12E-04	1.31E-03	6.85E-07	1.31E-01	1.00E-01
Total				6.85E-07	1.31E-01	

Risk Estimates for Total Trihalomethanes at the MCL
Reference doses and carcinogenic potency slope factors.

Contaminant	Oral RfD mg/kg/d	Inhaled RfD mg/kg/d	Oral Slope Factor kg·d/mg	Inhaled Slope Factor kg·d/mg
TOTAL TRIHALOMETHANES	1.00E-02		6.10E-03	8.05E-02

Note: The toxicity criteria for chloroform were used to estimate risk from trihalomethanes at the MCL of 100 ppb.

Risk Estimates for Total Trihalomethanes at the MCL
Adult resident drinking water ingestion.

Concentration	mg/L	CW
Ingestion rate	L/d	2 IR
Exposure frequency	d/y	350 EF
Exposure duration	y	24 ED
Body weight	kg	70 BW
Averaging time carc.	d	25550 AT
Averaging time ncarc.	d	8760 AT

$$\text{Intake (mg/kg-day)} = \frac{\text{CW} \times \text{IR} \times \text{EF} \times \text{ED}}{\text{BW} \times \text{AT}}$$

Contaminant	RME Conc. mg/L	Lifetime Average Daily Dose mg/kg/d	Chronic Daily Dose mg/kg/d	Lifetime Cancer Risk	Systemic Hazard Quotient
TOTAL TRIHALOMETHANES	1.00E-01	9.39E-04	2.74E-03	5.73E-06	2.74E-01
				5.73E-06	2.74E-01

Risk Estimates for Total Trihalomethanes at the MCL
Child resident drinking water ingestion.

Concentration	mg/L	CW
Ingestion rate	L/d	1 IR
Exposure frequency	d/y	350 EF
Exposure duration	y	6 ED
Body weight	kg	15 BW
Averaging time carc.	d	25550 AT
Averaging time ncarc.	d	2190 AT

$$\text{Intake (mg/kg-day)} = \frac{\text{CW} \times \text{IR} \times \text{EF} \times \text{ED}}{\text{BW} \times \text{AT}}$$

Contaminant	RME Conc. mg/L	Lifetime Average Daily Dose mg/kg/d	Chronic Daily Dose mg/kg/d	Lifetime Cancer Risk	Systemic Hazard Quotient
TOTAL TRIHALOMETHANES	1.00E-01	5.48E-04	6.39E-03	3.34E-06	6.39E-01
				3.34E-06	6.39E-01

Rate Estimates for Total Trihalomethanes at the MCL
Adult resident showering exposure concentrations.

L-phase i.e. COE	cm/h	30
O-phase i.e. HSC	cm/h	3000
Water Visc. at 20C	cp	1.002
Water Visc. at 40C	cp	0.588
Shower lamp	K	318
Droplet diameter	mm	1
Drop time	s	2
Shower flow rate	L/min	20
Shower stall volume	m3	2.80E+00
Shower duration	min	1.20E+01
Air exchange rate	min-1	0.0168887 (RANGE: .5 TO 1.5 PER HOUR)

Concentration	PMSE Conc. mg/L	Water Visc. cp	Henry's Constant atm-cm3/mol	W cm/s	K _{ow} cm3/mol	Corrected Trans. Coeff. cm/s	Temp.-adj. Trans. Coeff. cm/s	Conc. Inhalation HCO Conc. mg/L	VOC Genet. Rate g	Air Conc. at Shower Exposure mg/m3	Adj. Air Conc. in Shower mg/m3
TOTAL TRIHALOMETHANES	1.00E-01	1.18E+00	2.87E-03	1.22E+01	1.17E+03	1.12E+01	1.50E+01	3.80E-08	2.71E-01	2.88E+00	1.52E+00

Risk Estimates for Total Trihalomethanes at the MCL
Adult resident showering inhalation.

Concentration	mg/m3	CA
Inhalation rate	m3/min	0.0138889 IR
Exposure frequency	d/y	350 EF
Exposure duration	y	24 ED
Body weight	kg	70 BW
Averaging time carc.	d	25550 AT
Averaging time ncarc.	d	8760 AT
Shower duration	min/d	12 ET

$$\text{Intake (mg/kg-day)} = \frac{\text{CA} \times \text{IR} \times \text{ET} \times \text{EF} \times \text{ED}}{\text{BW} \times \text{AT}}$$

Contaminant	RME Conc. mg/m3	Lifetime Average Daily Dose	Chronic Daily Dose	Lifetime Cancer Risk	Systemic Hazard Quotient
		mg/kg/d	mg/kg/d		
TOTAL TRIHALOMETHANES	1.52E+00	1.19E-03	3.48E-03	9.60E-05	--
				9.60E-05	--

Risk Estimates for Total Trihalomethanes at the MCL
Child resident drinking water dermal contact

Concentration	mg/L	CW
Surface area	cm ²	7200 SA
Exposure frequency	d/y	350 EF
Exposure duration	y	6 ED
Body weight	kg	15 BW
Averaging time carc.	d	25550 AT
Averaging time ncarc.	d	2190 AT
Bath duration	h/d	0.33 ET
Conversion Factor	l/cm ³	1.00E-03 CF
Dermal Permeability Constant (chemical specific)	cm/hr	PC

$$\text{Absorbed Dose (mg/kg-day)} = \frac{\text{CW} \times \text{SA} \times \text{PC} \times \text{ET} \times \text{EF} \times \text{ED} \times \text{CF}}{\text{BW} \times \text{AT}}$$

Contaminant	RME Conc. mg/L	Lifetime Average Daily Dose mg/kg/d	Chronic Daily Dose mg/kg/d	Lifetime Cancer Risk	Systemic Hazard Quotient	Dermal Permeab. Coeff. cm/h
TOTAL TRIHALOMETHANES	1.00E-01	1.30E-04	1.52E-03	7.94E-07 7.94E-07	1.52E-01 1.52E-01	1.00E-01