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	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

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

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	1.98E-07	2.27E-01
CARBON TETRACHLORIDE		--	--	--	--
FLUORIDE		--	--	--	--
NITRITE		--	--	--	--
TOTAL RISK FROM ALL SOURCES (1992-ED= 1 YEAR)				1.98E-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

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

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	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	1.62E+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-06	1.62E+00
TOTAL RISK WITHOUT FLUORIDE				2.49E-06	5.57E-01

Chester Water Authority
Adult resident showering exposure concentrations.

L-phase t.c. CO2	cm/h	20
G-phase t.c. H2O	cm/h	3000
Water visc. at 20C	cp	1.002
Water visc. at 45C	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	min	1.20E+01
Air exchange rate	min-1	0.0166667 (RANGE: .5 TO 1.5 PER HOUR)

Contaminant	RME Conc. mg/L	Mol. Wt. g/mol	Henry's Constant atm-m3/mol	Kl cm/h	Kg cm/h	Overall Trans. Coef. KL cm/h	Trans-eff. Trans. Coef. KaL cm/h	Conc. leaving H2O Cwd mg/l	VOC Gener. Rate S mg/m3-min	Air Conc. at Shower End mg/m3	Avg. Air Conc. in Shower mg/m3
TETRACHLOROETHENE		1.66E+02	2.59E-02	1.03E+01	9.86E+02	1.02E+01	1.37E+01	--	--	--	--
TOTAL TRIHALOMETHANES	5.60E-02	1.19E+02	2.81E-03	1.22E+01	1.17E+03	1.12E+01	1.50E+01	2.20E-02	1.52E-01	1.65E+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	8.80E-01										
1989-ED= 1 YEAR											
TETRACHLOROETHENE		1.66E+02	2.59E-02	1.03E+01	9.86E+02	1.02E+01	1.37E+01	--	--	--	--
TOTAL TRIHALOMETHANES	7.20E-02	1.19E+02	2.81E-03	1.22E+01	1.17E+03	1.12E+01	1.50E+01	2.83E-02	1.95E-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	2.26E-02	1.17E-02
FLUORIDE											
NITRITE											
1990-ED= 1 YEAR											
TETRACHLOROETHENE		1.66E+02	2.59E-02	1.03E+01	9.86E+02	1.02E+01	1.37E+01	--	--	--	--
TOTAL TRIHALOMETHANES	7.80E-02	1.19E+02	2.81E-03	1.22E+01	1.17E+03	1.12E+01	1.50E+01	3.06E-02	2.11E-01	2.30E+00	1.19E+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		1.66E+02	2.59E-02	1.03E+01	9.86E+02	1.02E+01	1.37E+01	--	--	--	--
TOTAL TRIHALOMETHANES	8.30E-02	1.19E+02	2.81E-03	1.22E+01	1.17E+03	1.12E+01	1.50E+01	3.26E-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	1.66E+02	2.59E-02	1.03E+01	9.86E+02	1.02E+01	1.37E+01	3.66E-04	2.52E-03	2.74E-02	1.42E-02
TOTAL TRIHALOMETHANES	6.80E-02	1.19E+02	2.81E-03	1.22E+01	1.17E+03	1.12E+01	1.50E+01	2.56E-02	1.76E-01	1.94E+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= 1YEAR											
TETRACHLOROETHENE	1.00E-03	1.66E+02	2.59E-02	1.03E+01	9.86E+02	1.02E+01	1.37E+01	3.66E-04	2.52E-03	2.74E-02	1.42E-02
TOTAL TRIHALOMETHANES	6.80E-02	1.19E+02	2.81E-03	1.22E+01	1.17E+03	1.12E+01	1.50E+01	2.56E-02	1.76E-01	1.94E+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

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

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	cm3	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/cm3	1.00E-03	CF
Dermal Permeability Constant (chemical specific)	cm/hr		PC

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

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
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 (1969-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 (1993-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

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

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

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

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	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 resident showering exposure concentrations.

L-phase t.c. CO2	cm/h	20
G-phase t.c. H2O	cm/h	3000
Water visc. at 20C	cp	1.002
Water visc. at 48C	cp	0.566
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	min	1.20E+01
Air exchange rate	min-1	0.0166667 (RANGE: .5 TO 1.5 PER HOUR)

Contaminant	RME Conc. mg/L	Mol. Wt. g/mol	Henry's Constant atm-m3/mol	Kl cm/h	Kg cm/h	Overall Trans. Coeff. KL cm/h	Temp-adj. Trans. Coeff. Kbl. cm/h	Conc. leaving H2O Cntl mg/l	VOC Gener. Rate S mg/m3-min	Air Conc. at Shower End mg/m3	Avg. Air Conc. in Shower mg/m3
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	1.29E-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	1.86E+00	9.61E-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	1.60E-02	1.10E-01	1.20E+00	6.20E-01
TOTAL TRIHALOMETHANES 1989-ED-1 YEAR	3.64E-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	9.80E-02	6.30E+01	6.19E-02	1.67E+01	1.60E+03	1.67E+01	2.23E+01	5.14E-02	3.55E-01	3.86E+00	1.99E+[illegible]
TOTAL TRIHALOMETHANES 1989-ED-30 YEARS	9.80E-02	1.19E+02	2.87E-03	1.22E+01	1.17E+03	1.12E+01	1.50E+01	3.86E-02	2.66E-01	2.89E+00	1.49E+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

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

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	cm3	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/cm3	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

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

Contaminant	RME Conc. mg/L	Lifetime Average Daily Dose mg/kg/d	Chronic Daily Dose mg/kg/d	Lifetime Cancer Risk	Systemic Hazard Quotient
CARBON TETRACHLORIDE	--	--	--	--	--
TOTAL TRIHALOMETHANES	6.83E-02	2.67E-05	1.87E-03	1.63E-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				1.63E-07	6.44E-01
Total Risk without Fluoride				1.63E-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

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

Contaminant	RME Conc. mg/L	Lifetime Average Daily Dose mg/kg/d	Chronic Daily Dose mg/kg/d	Lifetime Cancer Risk	Systemic Hazard Quotient
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	3.56E-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	3.56E-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	4.56E-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 t.c. CO2	cm/h	20
G-phase t.c. H2O	cm/h	3000
Water visc. at 20C	cp	1.000
Water visc. at 45C	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	2.80E+00
Shower duration	min	1.20E+01
Air exchange rate	min-1	0.0166667 (RANGE: .5 TO 1.5 PER HOUR)

Contaminant	Raw Conc. mg/L	Mol. Wt. g/mol	Henry's Constant atm-m3/mol	Kl cm/h	Kg cm/h	Overall Trans. Coeff. KL cm/h	Temp-adj. Trans. Coeff. KaL cm/h	Conc. leaving H2O Cont m-g/l	VOC Gener. Rate S mg/m3-min	Air Conc. at Shower End mg/m3	Avg. Air Conc. in Shower mg/m3
CARBON TETRACHLORIDE	--	1.54E+02	2.41E-02	1.07E+01	1.03E+03	1.08E+01	1.48E+01	--	--	--	--
TOTAL TRIHALOMETHANES	6.83E-02	1.19E+02	2.81E-03	1.22E+01	1.17E+03	1.12E+01	1.50E+01	2.68E-02	1.88E-01	2.01E+03	1.04E+00
FLUORIDE	1.00E+00 na										
1990(ED=1 year)											
CARBON TETRACHLORIDE	5.00E-04	1.54E+02	2.41E-02	1.07E+01	1.03E+03	1.08E+01	1.48E+01	1.88E-04	1.30E-03	1.41E-02	7.30E-03
TOTAL TRIHALOMETHANES	7.18E-02	1.19E+02	2.81E-03	1.22E+01	1.17E+03	1.12E+01	1.50E+01	2.81E-02	1.84E-01	2.11E+03	1.09E+00
FLUORIDE	1.01E+00 na										
1990(ED=1 year)											
CARBON TETRACHLORIDE	3.00E-04	1.54E+02	2.41E-02	1.07E+01	1.03E+03	1.08E+01	1.48E+01	1.13E-04	7.78E-04	8.47E-03	4.38E-03
TOTAL TRIHALOMETHANES	7.81E-02	1.19E+02	2.81E-03	1.22E+01	1.17E+03	1.12E+01	1.50E+01	2.89E-02	2.08E-01	2.34E+03	1.18E+00
FLUORIDE	1.01E+00 na										
1991(ED=1 year)											
CARBON TETRACHLORIDE	--	1.54E+02	2.41E-02	1.07E+01	1.03E+03	1.08E+01	1.48E+01	--	--	--	--
TOTAL TRIHALOMETHANES	5.88E-02	1.19E+02	2.81E-03	1.22E+01	1.17E+03	1.12E+01	1.50E+01	2.31E-02	1.88E-01	1.73E+03	8.88E-01
FLUORIDE	1.00E+00 na										
1992(ED=1 year)											
CARBON TETRACHLORIDE	3.00E-04	1.54E+02	2.41E-02	1.07E+01	1.03E+03	1.08E+01	1.48E+01	1.13E-04	7.78E-04	8.47E-03	4.38E-03
TOTAL TRIHALOMETHANES	6.33E-02	1.19E+02	2.81E-03	1.22E+01	1.17E+03	1.12E+01	1.50E+01	3.27E-02	2.38E-01	2.48E+03	1.27E+00
FLUORIDE	9.80E-01 na										
1993(ED=1 year)											
CARBON TETRACHLORIDE	3.00E-04	1.54E+02	2.41E-02	1.07E+01	1.03E+03	1.08E+01	1.48E+01	1.13E-04	7.78E-04	8.47E-03	4.38E-03
TOTAL TRIHALOMETHANES	6.33E-02	1.19E+02	2.81E-03	1.22E+01	1.17E+03	1.12E+01	1.50E+01	3.27E-02	2.38E-01	2.48E+03	1.27E+00
FLUORIDE	9.80E-01 na										
1993(ED=30 year)											

na--not applicable

Philadelphia Water Department
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

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

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-05	1.75E-02

na - not applicable

Philadelphia Water Department
Child resident drinking water dermal contact

Concentration	mg/L		CW
Surface area	cm3	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/cm3	1.00E-03	CF
Dermal Permeability Constant (chemical specific)	cm/hr		PC

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

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
CARBON TETRACHLORIDE	--	--	--	--	--	2.20E-0
TOTAL TRIHALOMETHANES	6.83E-02	1.48E-05	1.04E-03	9.04E-08	1.04E-01	1.00E-0
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	1.28E-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	6.82E-07	1.27E-01	1.00E-0
FLUORIDE	9.80E-01	na				
Total Risk from All Sources - 1993 (ED = 30 Year)				6.73E-07	1.28E-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

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	8.62E–02	4.72E–04	5.51E–03	2.88E–06	5.51E–01
Total				2.88E–06	5.51E–01

Coatesville Water Authority
Adult resident showering exposure concentrations.

L-phase t.c. CO2	cm/h	20
G-phase t.c. H2O	cm/h	3000
Water visc. at 20C	cp	1.002
Water visc. at 48C	cp	0.599
Shower temp	K	318
Droplet diameter	mm	1
Drop time	s	2
Shower flow rate	L/min	20
Shower stall volume	m3	2.50E+00
Shower duration	min	1.20E+01
Air exchange rate	min-1	0.0166667 (RANGE: .5 TO 1.5 PER HOUR)

Contaminant	Raw Conc. mg/L	Mol. Wt. g/mol	Henry's Constant atm-m3/mol	Kl cm/h	Kg cm/h	Overall Trans. Coeff. Kl cm/h	Transp-cell Trans. Coeff. Kl cm/h	Conc. leaving H2O Cwq mg/l	VOC Gener. Rate S mg/m3-min	Air Conc. at Shower Start mg/m3	Avg. Air Conc. in Shower mg/m3
TOTAL TRIHALOMETHANES	8.80E-03	1.19E+02	2.87E-03	1.22E+01	1.17E+03	1.12E+01	1.50E+01	3.85E-02	2.98E-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

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

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	--

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

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

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	--

Coatesville Water Authority
Child resident drinking water dermal contact

Concentration	mg/L		CW
Surface area	cm3	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/cm3	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	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

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	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

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	1.00E−01	5.48E−04	6.39E−03	3.34E−06	6.39E−01
				3.34E−06	6.39E−01

Risk Estimates for Total Trihalomethanes at the MCL
Adult resident's showering exposure concentrations

L-phase t.c. CO2	cm/h	20
G-phase t.c. H2O	cm/h	3000
Water visc. at 20C	cp	1.002
Water visc. at 45C	cp	0.599
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	min	1.20E+01
Air exchange rate	min-1	0.0166667 (RANGE: .5 TO 1.5 PER HOUR)

Contaminant	RME Conc. mg/L	Mol Wt. g/mol	Henry's Constant atm-m3/mol	Kl cm/h	Kg cm/h	Overall Trans. Coeff. KL cm/h	Temp-adj. Trans. Coeff. Kol. cm/h	Conc. leaving H2O Coef mg/l	VOC Gener. Rate G mg/cub-m/h	Air Conc. at Shower Entry mg/m3	Avg. Air Conc. in Shower mg/m3
TOTAL TRIHALOMETHANES	1.00E-01	1.19E+02	2.87E-03	1.22E+01	1.17E+03	1.12E+01	1.50E+01	3.83E-02	2.71E-01	2.85E+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

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

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	1.52E+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	cm3	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/cm3	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	1.00E-01	1.30E-04	1.52E-03	7.94E-07	1.52E-01	1.00E-01
				7.94E-07	1.52E-01	