

Appendix B - Table/List



Table 1. Analytes for which at least one sample was reported above the screening value or no screening value exists

Analytes	Range mg/L	Average mg/L	Screening Level * mg/L	RfD † mg/kg-day	Estimated Daily Absorbed (Dermal Contact)		Estimated Daily Ingestion (Incidental Ingestion)	
					Adult mg/kg-day	Child mg/kg-day	Adult mg/kg-day	Child mg/kg-day
1,2,3-Trichlorobenzene	ND – 0.322	8.4×10^{-2}	$4.0 \times 10^{-2} ‡$	$2.0 \times 10^{-2} §$	1.4×10^{-4}	3.1×10^{-4}	3.8×10^{-8}	1.7×10^{-7}
Bromide	0.05 – 2.0	1.0×10^{-3}	None	$1.0 \times 10^0 ¶$	8.9×10^{-4}	1.9×10^{-3}	2.4×10^{-7}	1.0×10^{-6}
p-Isopropyltoluene	ND – 0.21	4.6×10^{-2}	None	1.0×10^{-1}	9.4×10^{-5}	2.0×10^{-3}	2.5×10^{-8}	1.1×10^{-7}
Tetrachloroethene	ND – 2.56	4.3×10^{-1}	5.0×10^{-3}	1.0×10^{-2}	5.5×10^{-4}	1.2×10^{-3}	3.0×10^{-7}	1.3×10^{-6}
Total Recoverable Antimony	ND – 0.225	8.6×10^{-2}	6.0×10^{-3}	4.0×10^{-4}	1.0×10^{-4}	2.2×10^{-4}	2.6×10^{-8}	1.2×10^{-7}
Total Recoverable Arsenic	ND – 0.146	5.9×10^{-2}	1.0×10^{-2}	3.0×10^{-4}	6.5×10^{-5}	1.4×10^{-4}	1.7×10^{-8}	7.5×10^{-8}
Total Recoverable Lead	ND – 0.223	6.3×10^{-2}	$1.5 \times 10^{-2} **$	None	4.0×10^{-9}	8.6×10^{-9}	2.6×10^{-8}	1.2×10^{-7}
Total Recoverable Manganese	0.197 – 6.03	3.6×10^0	$5.0 \times 10^{-2} ††$	4.7×10^{-2}	2.7×10^{-3}	5.8×10^{-3}	7.1×10^{-7}	3.1×10^{-6}
Total Recoverable Molybdenum	ND – 0.547	3.0×10^{-1}	$2.0 \times 10^{-2} †††$	5.0×10^{-3}	2.4×10^{-4}	5.3×10^{-4}	6.4×10^{-8}	2.8×10^{-7}
Total Recoverable Selenium	ND – 1.10	2.5×10^{-1}	5.0×10^{-2}	5.0×10^{-3}	4.9×10^{-4}	1.1×10^{-3}	1.3×10^{-7}	5.7×10^{-7}
Total Recoverable Zinc	0.31 – 50.5	19.3×10^0	$5.0 \times 10^0 ††$	3.0×10^{-1}	1.4×10^{-4}	2.9×10^{-4}	5.9×10^{-6}	2.6×10^{-5}

* Unless other wise noted, screening levels are established by the US Environmental Protection Agency (US EPA) Maximum Contaminant Level

† RfD = Reference Dose = an estimate (with uncertainty spanning perhaps an order of magnitude) of a daily exposure to the human population (including sensitive subgroups) that is likely to be without an appreciable risk of deleterious effects during a lifetime.

‡ LTHA = (US EPA) Lifetime health advisory = The concentration of a chemical in drinking water that is not expected to cause any adverse noncarcinogenic effects over a lifetime of exposure with a margin of safety.

§ Tolerable Daily Intake. International Programme on Chemical Safety. World Health Organization 1991.

¶ Acceptable daily intake (ADI) set by the Joint Food and Agriculture Organization of the United Nations and World Health Organization.

** US Environmental Protection Agency Action Level

†† US Environmental Protection Agency Secondary Drinking Water Regulations

††† Reference Dose Media Evaluation Guide (REMG) is the concentration of a contaminant in air, water or soil that corresponds to EPA's RfD for that contaminant when default values for body weight and intake rates are taken into account.

Note: Samples were collected by Arkansas Department of Environmental Quality between January 6 – 15, 2004.

mg/L = milligrams per liter; mg/kg-day = milligrams per kilogram per day.

LIST OF ANALYTES

1.	(2,4,5-Trichlorophenoxy)acetic Acid	36.	Ammonia as nitrogen	71.	Endrin Aldehyde
2.	(2,4-Dichlorophenoxy)acetic Acid	37.	Atraton	72.	Endrin Ketone
3.	(2,4-Dichlorophenoxy)butyric Acid	38.	Atrazine	73.	Ethylbenzene
4.	1,1,1,2-Tetrachloroethane	39.	Bentazon	74.	Fluchloralin
5.	1,1,1-Trichloroethane	40.	Benzene	75.	Fluoride
6.	1,1,2,2-Tetrachloroethane	41.	Beta-BHC	76.	Fonofos
7.	1,1,2-Trichloroethane	42.	Bromide	77.	Gamma-BHC
8.	1,1-Dichloroethene	43.	Bromobenzene	78.	Heptachlor
9.	1,1-Dichloropropene	44.	Bromochloromethane	79.	Heptachlor Epoxide
10.	1,2,3-Trichlorobenzene	45.	Bromodichloromethane	80.	Hexachlorobutadiene
11.	1,2,3-Trichloropropane	46.	Bromoform	81.	Hexazinone
12.	1,2,4-Trichlorobenzene	47.	Bromomethane	82.	Isopropylbenzene
13.	1,2,4-Trimethylbenzene	48.	Carbon Tetrachloride	83.	m+p_Xylene
14.	1,2-Dibromo-3-chloropropane	49.	Chloride	84.	Malathion
15.	1,2-Dibromoethane	50.	Chlorobenzene	85.	Methoxychlor
16.	1,2-Dichlorobenzene	51.	Chloroethane	86.	Methylene_chloride
17.	1,2-Dichloroethane	52.	Chloroform	87.	Methyl-Parathion
18.	1,2-Dichloropropane	53.	Chloromethane	88.	Metolachlor
19.	1,3,5-Trimethylbenzene	54.	Chlorpyrifos	89.	Metribuzin
20.	1,3-Dichlorobenzene	55.	cis-1-2-Dichloroethene	90.	Molinate
21.	1,3-Dichloropropane	56.	cis-1-3-Dichloropropene	91.	Naphthalene
22.	1,4-Dichlorobenzene	57.	Cyanazine	92.	n-butylbenzene
23.	2-(2,4,5-Trichlorophenoxy)propionic Acid	58.	Cyprazine	93.	Nitrite+Nitrate-N
24.	2-(2,4-Dichlorophenoxy)propionic Acid	59.	Delta-BHC	94.	Norflurazon
25.	2,2-Dichloropropane	60.	Diazinon	95.	n-Propylbenzene
26.	2-Chlorotoluene	61.	Dibromochloromethane	96.	Orthophosphate as phosphorus
27.	3,5-Dichlorobenzoic Acid	62.	Dibromomethane	97.	o-Xylene
28.	3,6-Dichloro-2-methoxybenzoic Acid	63.	Dichlorodifluoromethane	98.	PCB-as-AR1221
29.	4,6-Dinitro-2-sec-butylphenol	64.	Dieldrin	99.	PCB-as-AR1232
30.	4-Chlorotoluene	65.	Dimethazone	100.	PCB-as-AR1242
31.	Acifluorfen	66.	Dipropetryn	101.	PCB-as-AR1248
32.	Alachlor	67.	Endosulfan I	102.	PCB-as-AR1254
33.	Aldrin	68.	Endosulfan II		
34.	Alpha-BHC	69.	Endosulfan Sulfate		
35.	Ametryn	70.	Endrin		



LIST OF ANALYTES (Continued)

103.	PCB-as-AR1260	133.	Total Recoverable Chromium
104.	Pendimethalin	134.	Total Recoverable Cobalt
105.	Pentachlorophenol	135.	Total Recoverable Copper
106.	Picloram	136.	Total Recoverable Iron
107.	p-Isopropyltoluene	137.	Total Recoverable Lead
108.	p-p'-DDD	138.	Total Recoverable Magnesium
109.	p-p'-DDE	139.	Total Recoverable Manganese
110.	p-p'-DDT	140.	Total Recoverable Molybdenum
111.	Procyazine	141.	Total Recoverable Nickel
112.	Prometon	142.	Total Recoverable Potassium (mg/L)
113.	Prometryn	143.	Total Recoverable Selenium
114.	Propachlor	144.	Total Recoverable Silver
115.	Propazine	145.	Total Recoverable Sodium (mg/L)
116.	sec-Butylbenzene	146.	Total Recoverable Thallium
117.	Simazine	147.	Total Recoverable Vanadium
118.	Styrene	148.	Total Recoverable Zinc
119.	Sulfate	149.	trans-1-2-Dichloroethene
120.	Technical Chlordane	150.	trans-1-3-Dichloropropene
121.	Terbutylazine	151.	Trichloroethene
122.	Terbutryn	152.	Trichlorofluoromethane
123.	tert-Butylbenzene	153.	Trifluralin
124.	Tetrachloroethene	154.	Vinyl Chloride
125.	Toluene		
126.	Total Recoverable Aluminum		
127.	Total Recoverable Antimony		
128.	Total Recoverable Arsenic		
129.	Total Recoverable Barium		
130.	Total Recoverable Beryllium		
131.	Total Recoverable Cadmium		
132.	Total Recoverable Calcium		

Appendix C - Exposure Dose Calculations

This section provides the calculated exposure doses and assumptions used for a completed exposure pathway. The dose estimates for each of these pathways are described in the discussion section of the document. Maximum concentrations are used to calculate these doses, representing a “worst-case” scenario that may overestimate actual exposure.

The following exposure dose equation and exposure assumptions were used to calculate the Estimated Daily Ingestion (Incidental Ingestion) doses in Appendix B, Table 1.

The swimming frequency and time period of each swimming event determine the average time spent swimming per day. The average daily dose for chemical pollutants from the swimming water ingestion exposure pathway is evaluated as follows:

$$D_{wwi} = C_{swi} T E_w F E_{sw} U_{ww} \frac{F_{ww} E D_{ww}}{A T_{wwi} B W_{ww}}$$

Where:

D_{wwi} = average daily dose from the pollutant (i) in the water inadvertently ingested while swimming (mg/kg-day)

C_{swi} = surface water concentration of the pollutant (i) at the location of swimming (mg/L)

$T E_w$ = duration of an average swimming event (hours/event)

$F E_{sw}$ = average frequency of swimming events (events/day)

U_{ww} = rate of inadvertent ingestion of water while swimming (Liters per hour)

F_{ww} = fraction of days per year that swimming occurs (dimensionless)

$E D_{ww}$ = exposure duration for the swimming water ingestion pathway (yr)

$A T_{wwi}$ = averaging time for the swimming water ingestion pathway for exposure to the pollutant (i) (yr)

$B W_{ww}$ = body weight of individuals exposed by the swimming water ingestion pathway (kg).

The fraction of days per year that swimming occurs (F_{ww}) will normally be set to a value of 1.0, with the average frequency of swimming events ($F E_{sw}$) set to represent the times a person swims per year. For example, if swimming occurs 7 times per year, the average frequency of swimming events is 7/365, and the fraction of days per year that swimming activities could occur is 1.0 (all year) [17].



Appendix C: Exposure Dose Calculations (Continued)

The following exposure dose equation and exposure assumptions were used to calculate the Estimated Daily Absorbed (Dermal Contact) doses in Appendix B, Table 1.

The average daily dose for chemical pollutants from the dermal contact with the waters of Railroad Creek is evaluated as follows:

$$\text{Daily Absorbed Dose} = (\text{CW} \times \text{SA} \times \text{PC} \times \text{ET} \times \text{EF} \times \text{ED} \times \text{CF}) / (\text{BW} \times \text{AT})$$

Where:

Daily Absorbed Dose = average daily dose from the pollutant (i) in the water absorbed during contact with the water (mg/kg-day)

CW = Chemical concentration in water (mg/L)

SA = Skin surface area available for contact (centimeter squared or cm^2)

PC = Chemical-specific dermal permeability constant (cm/hour)

ET = Exposure time (hours/day)

EF = Exposure frequency (days/year)

ED = Exposure duration (years)

CF = Volumetric conversion factor for water (1 liter/1000 centimeter cubed or cm^3)

BW = Body weight (kg)

AT = Averaging time (period over which exposure is averaged – days) [18].