N

Development of Background Benthos-to-Sculpin Trophic Transfer Factors

This page intentionally left blank

Appendix N

Development of Background Benthos-to-Sculpin Trophic Transfer Factors

This appendix develops background Trophic Transfer Factors (TTFs) from metals data for slimy sculpin (*Cottus cognatus*) and benthic-macroinvertebrate samples collected from reference creeks in the middle Kuskokwim River region, Alaska. TTFs were calculated for 15 metals using the following equation:

$$TTF = C_f/C_b$$

Where:

   TTF = Trophic Transfer Factor (unitless)
   C_f = Sculpin metal concentration (mg/kg wet weight) (from Appendix M)
   C_b = Benthic macroinvertebrate metal concentration (mg/kg dry weight) (from Appendix L)

Background benthos-to-sculpin TTFs are provided in Table N-1.

Table N-1. Background Trophic Transfer Factors for Metals Developed from Sculpin and Benthic Macroinvertebrate Data from Reference Creeks in the Middle Kuskokwim River Region, Alaska.

Analyte	Slimy Sculpin EPC [a] (mg/kg wet)	Source	Benthic Macroinvertebrate EPC [a] (mg/kg wet)	Source	TTF [d] (unitless)
Antimony	0.042	Appendix M	0.148	Appendix L	0.28
Arsenic	0.15	Appendix M	1.298	Appendix L	0.112
Barium	4.26	Appendix M	115.3	Appendix L	0.037
Beryllium	0.013	-- (b)	0.028	Appendix L	0.45
Cadmium	0.046	Appendix M	0.418	Appendix L	0.11
Chromium	0.12	Appendix M	1.366	Appendix L	0.084
Cobalt	(c)	--	(c)	--	--
Copper	0.92	Appendix M	9.406	Appendix L	0.098
Lead	0.029	Appendix M	0.458	Appendix L	0.063
Manganese	10.9	Appendix M	143	Appendix L	0.076
Mercury	0.05	Appendix M	0.0346	Appendix L	1.45
Methylmercury	0.068	Appendix M	0.021	Appendix L	3.17
Nickel	0.087	Appendix M	1.84	Appendix L	0.047
Selenium	1.60	Appendix M	1.88	Appendix L	0.85
Silver	(c)	--	(c)	--	--
Thallium	(c)	--	(c)	--	--
Vanadium	0.24	Appendix M	2.31	Appendix L	0.104
Zinc	24.0	Appendix M	51.3	Appendix L	0.47

Key:

-- (dash) = not available.

EPC = exposure point concentration

MDL = method detection limit

TTF = trophic transfer factor

UCL = Upper confidence limit

Notes:

a = Usually 95% UCL on average concentration.

b = not detected; one-half MDL used as EPC.

c = not analyzed in slimy sculpin or benthos

d = (Sculpin EPC) / (Benthic Macroinvertebrate EPC)