

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P		
41	STEP 2:		INPUT AMBIENT AND EFFLUENT DATA															
42			CALCULATE IN-STREAM WASTE CONCENTRATIONS															
43																		
44	DATA INPUT		For less than 20 data points enter geometric mean concentration as micro-gram per liter (ug/l or ppb).															
45			For 20 or more data points in set enter highest concentration as micro-gram per liter (ug/l or ppb).															
46																		
47			Effluent value reported as "< detection level" (DL) but the DL is greater than MQL, the 1/2 DL is used.															
48			Effluent value reported as "< detection level" (DL) and the DL is smaller than MQL, "0" is used.															
49			If a firm value is reported, even less than MQL, the reported value is used.															
50																		
51			The following formulae is used to calculate the Instream Waste Concentration (IWC)															
52			(Please refer to CPP for detail)															
53			$IWC = [(F*Qa*Cb) + (Qe*2.13*Ce)] / (F*Qa + Qe)$															
54			Where:															
55			IWC = Instream Waste Concentration															
56			F = Fraction of stream allowed for mixing															
57			Ce = Reported concentration in effluent															
58			Cb = Ambient stream concentration upstream of discharge															
59			Qe = Plant effluent flow															
60			Qb = Critical low flow of stream at discharge point expressed as the 7Q10 or harmonic mean flow for human health criteria															
61			Upstream Flow (Qb)= (% of 7Q10) X 7Q10 for Chronic and Acute															
62																		
63			The following formulae convert metals reported in total form to dissolved form if criteria are in dissolved form															
64																		
65			$Kp = Kpo * (TSS**a)$															
66			Kp = Linear partition coefficient; Kpo and a can be found in table below															
67			$C/Ct = 1 / (1 + Kp*TSS* 10^{-6})$															
68			TSS = Total suspended solids concentration found in receiving stream (or in effluent for intermittent stream)															
69			$Total\ Metal\ Criteria\ (Ct) = Cr / (C/Ct)$															
70			C/Ct = Fraction of metal dissolved; and Cr = Dissolved criteria value															
71																		
72																		
73																		
74																		
75																		
76																		
77																		
78																		
79																		
80																		
81																		
82																		
69	*Stream Linear Partition Coefficient (Insert "Dissolved" Conc in Column B to convert to "Total")											Lake Linear Partition Coefficient						
70	Total Metals	Dissolved Value in Stream	Kpo	alpha (a)	Kp	C/Ct	Total Value					Kpo	alpha (a)	Kp	C/Ct	Total Value		
73	Cadmium		4000000	-1.13	582706.889	0.237818469	0.00					3520000.00	-0.92	733514.98	0.1986361	0		
74	Chromium(3)		3360000	-0.93	688338.365	0.208948818	0.00					2170000.00	-0.27	1369499.28	0.1172024	0		
75	Copper		1040000	-0.74	294554.016	0.381672529	0.00					2850000.00	-0.9	614495.12	0.2283249	0		
76	Lead		2800000	-0.8	715925.58	0.202527926	0.00					2040000.00	-0.53	826490.64	0.1803199	0		
77	Mercury		2900000	-1.14	415321.613	0.30448177	0.00					1970000.00	-1.17	268066.09	0.4041443	0		
78	Nickel		490000	-0.57	185433.992	0.495077211	0.00					2210000.00	-0.76	604946.03	0.2310962	0		
79	Zinc		1250000	-0.7	379014.766	0.324193117	0.00					3340000.00	-0.68	1047851.74	0.1478593	0		
80	Silver		2400000	-1.03	414607.994	0.30484608	0.00					2400000.00	-1.03	414607.99	0.3048461	0		
81	<i>*Note: Use this section to convert lab concentrations shown as "dissolved" to "total"</i>																	
82												Dissolved	Total					

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
127	The following formulas are used to calculate the instream waste concentration (IWC) for each pollutant:															
128																
129	IWC = [(Frac X Critical Flow X Cb) + (2.13 X Ce X Qd)] / [Frac X Critical Flow + Qd] where the critical flow is the 7Q10 except for lakes with the Jet Stream Model.															
130	Use EPA Statistical Factor of 2.13 for less than 20 Ce data points with the Geometric Mean of the Ce's; use 1 for more than 20 data points with the maximum Ce.															
131	IWC = (DF X Ce) + Cb for lakes with Jet Stream Model.															
132	POLLUTANTS	Number of Data points	MQL	EPA Statistical Factor	Background Conc. Cb ug/l	Effluent Conc. Ce ug/l	Domestic Supply IWC ug/l	Acute Aquatic IWC ug/l	Chronic Aquatic IWC ug/l	Bioacc. IWC ug/l	[Reserved]	Arkansas Acute Aquatic ug/l	Arkansas Chronic Aquatic ug/l	Arkansas Bioacc. ug/l	EPA Bioacc. ug/l	
133			ug/l	Factor	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l		ug/l	ug/l	ug/l	ug/l	
137	METALS AND CYANIDE															
138	1. Antimony Total	1	60	2.13	0	0	0.00	0.00	0.00	0.00	9999999	9999999.00	9999999.00	9999999	6,400	
139	2. Arsenic Total	1	0.5	2.13	0	4.24	9.03	9.03	9.03	9.03	9999999	9999999.00	9999999.00	9999999	1.4	
140	3. Beryllium Total	1	0.5	2.13	0	0	0.00	0.00	0.00	0.00	9999999	9999999.00	9999999.00	4	4	
141	4. Cadmium Total	1	1	2.13	0	0	0.00	0.00	0.00	0.00	9999999	4.37	1.82	9999999	5	
142	6. Chromium (Tri)	1	10	2.13	0	0	0.00	0.00	0.00	0.00	9999999	1006.35	326.45	9999999	100	
143	7. Chromium (hex)	1	10	2.13	0	0	0.00	0.00	0.00	0.00	9999999	15.71	10.58	9999999	100	
144	8. Copper Total	1	0.5	2.13	0	0	0.00	0.00	0.00	0.00	9999999	14.79	10.93	9999999	13,000	
145	9. Lead Total	1	0.5	2.13	0	0	0.00	0.00	0.00	0.00	9999999	87.29	3.40	9999999	50	
146	10. Mercury Total	1	0.005	2.13	0	0.00314	0.00669	0.00669	0.00669	0.00669	9999999	6.70	0.012	9999999	2	
147	12. Nickel Total	1	0.5	2.13	0	1.38	2.94	2.94	2.94	2.94	9999999	1061.45	117.88	9999999	46,000	
148	13. Selenium Total	1	5	2.13	0	0	0.00	0.00	0.00	0.00	9999999	20.00	5.00	9999999	42,000	
149	14. Silver Total	1	0.5	2.13	0	0	0.00	0.00	0.00	0.00	9999999	1.51	9999999.00	9999999		
150	15. Thallium Total	1	0.5	2.13	0	0	0.00	0.00	0.00	0.00	9999999	9999999.00	9999999.00	9999999	4.7	
151	16. Zinc Total	1	20	2.13	0	0	0.00	0.00	0.00	0.00	9999999	130.87	119.50	9999999	260,000	
152	129. Phenols, Total	1	5	2.13	0	0	0.00	0.00	0.00	0.00	9999999	9999999.00	9999999.00	9999999	#####	
153	17. Cyanide Total	1	10	2.13	0	0	0.00	0.00	0.00	0.00	9999999	22.36	5.2	9999999	4,000	
156	DIOXIN															
157	18. 2-3-7-8-TCDD	1	0.00001	2.13	0	0	0.00	0.00	0.00	0.00	9999999	9999999	9999999	1.00E-06		
159	VOLATILE COMPOUNDS															
160	19. Acrolein	1	50	2.13	0	0	0.00	0.00	0.00	0.00	9999999	9999999	9999999	9999999		
161	20. Acrylonitrile	1	20	2.13	0	0	0.00	0.00	0.00	0.00	9999999	9999999	9999999	9999999		
162	21. Benzene	1	10	2.13	0	0	0.00	0.00	0.00	0.00	9999999	9999999	9999999	9999999		
163	22. Bromoform	1	10	2.13	0	0	0.00	0.00	0.00	0.00	9999999	9999999	9999999	9999999		
164	23. Carbon Tetrach	1	2	2.13	0	0	0.00	0.00	0.00	0.00	9999999	9999999	9999999	9999999		
165	24. Chlorobenzene	1	10	2.13	0	0	0.00	0.00	0.00	0.00	9999999	9999999	9999999	9999999		
166	25. Chlorodibromomethane	1	10	2.13	0	0	0.00	0.00	0.00	0.00	9999999	9999999	9999999	9999999		
167	26. Chloroethane	1	50	2.13	0	0	0.00	0.00	0.00	0.00	9999999	9999999	9999999	9999999		
168	27. 2-Chloroethylvinyl ether	1	10	2.13	0	0	0.00	0.00	0.00	0.00	9999999	9999999	9999999	9999999		
169	28. Chloroform	1	10	2.13	0	0	0.00	0.00	0.00	0.00	9999999	9999999	9999999	9999999		
170	29. Dichlorobromomethane	1	10	2.13	0	0	0.00	0.00	0.00	0.00	9999999	9999999	9999999	9999999		
171	30. 1-1-Dichloroethane	1	10	2.13	0	0	0.00	0.00	0.00	0.00	9999999	9999999	9999999	9999999		
172	31. 1-2-Dichloroethane	1	10	2.13	0	0	0.00	0.00	0.00	0.00	9999999	9999999	9999999	9999999		
173	32. 1-1-Dichloroethylene	1	10	2.13	0	0	0.00	0.00	0.00	0.00	9999999	9999999	9999999	9999999		
174	33. 1,2 Dichloropropane	1	10	2.13	0	0	0.00	0.00	0.00	0.00	9999999	9999999	9999999	9999999		
175	34. 1,3 Dichloropropylene	1	10	2.13	0	0	0.00	0.00	0.00	0.00	9999999	9999999	9999999	9999999		
176	35. Ethylbenzene	1	10	2.13	0	0	0.00	0.00	0.00	0.00	9999999	9999999	9999999	9999999		
177	37. Methyl Chloride	1	50	2.13	0	0	0.00	0.00	0.00	0.00	9999999	9999999	9999999	9999999		
178	36. Methyl bromide	1	50	2.13	0	0	0.00	0.00	0.00	0.00	9999999	9999999	9999999	9999999		
179	38. Methylene chloride	1	20	2.13	0	0	0.00	0.00	0.00	0.00	9999999	9999999	9999999	9999999		
180	39. 1-1-2-2-Tetrachloroethane	1	10	2.13	0	0	0.00	0.00	0.00	0.00	9999999	9999999	9999999	9999999		
181	40. Tetrachloroethylene	1	10	2.13	0	0	0.00	0.00	0.00	0.00	9999999	9999999	9999999	9999999		
182	41. Toluene	1	10	2.13	0	0	0.00	0.00	0.00	0.00	9999999	9999999	9999999	9999999		
183	42. 1,2-trans-dichloroethylene	1	10	2.13	0	0	0.00	0.00	0.00	0.00	9999999	9999999	9999999	9999999		

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
184	44. 1-1-2-Trichloroethane		1	10	2.13	0	0	0.00	0.00	0.00	0.00	9999999	9999999	9999999	9999999	
185	43. 1-1-1-Trichloroethane		1	10	2.13	0	0	0.00	0.00	0.00	0.00	9999999	9999999	9999999	9999999	
186	45. Trichloroethylene		1	10	2.13	0	0	0.00	0.00	0.00	0.00	9999999	9999999	9999999	9999999	
187	46. Vinyl Chloride		1	10	2.13	0	0	0.00	0.00	0.00	0.00	9999999	9999999	9999999	9999999	
189	ACID COMPOUNDS															
190	47. 2-Chlorophenol		1	10	2.13	0	0	0.00	0.00	0.00	0.00	9999999	9999999	9999999	9999999	
191	48. 2-4-Dichlorophenol		1	10	2.13	0	0	0.00	0.00	0.00	0.00	9999999	9999999	9999999	9999999	
192	49. 2-4 Dimethylphenol		1	10	2.13	0	0	0.00	0.00	0.00	0.00	9999999	9999999	9999999	9999999	
193	50. 4,6-Dinitro-o-Cresol		1	50	2.13	0	0	0.00	0.00	0.00	0.00	9999999	9999999	9999999	9999999	
194	51. 2,4-Dinitrophenol		1	50	2.13	0	0	0.00	0.00	0.00	0.00	9999999	9999999	9999999	9999999	
195	52.-53. Nitrophenols		1	20	2.13	0	0	0.00	0.00	0.00	0.00	9999999	9999999	9999999	9999999	
196	54. 4 Chloro-3-methylpheno		1	10	2.13	0	0	0.00	0.00	0.00	0.00	9999999	9999999	9999999	9999999	
197	55. Pentachlorophenol		1	5	2.13	0	0	0.00	0.00	0.00	0.00	9999999	8.72	6.69	9999999	
198	56. Phenol		1	10	2.13	0	0	0.00	0.00	0.00	0.00	9999999	9999999	9999999	9999999	
199	57. 2-4-6-Trichlorophenol		1	10	2.13	0	0	0.00	0.00	0.00	0.00	9999999	9999999	9999999	9999999	
201						Ambient Background Conc.	Effluent Conc.	Domestic Supply	Acute Aquatic	Chronic Aquatic	Human Health	[Reserved]	Acute Aquatic Criteria	Chronic Aquatic Criteria	Human Health Criteria	
202	BASE/NEUTRAL COMPOUNDS															
203	58. Acenaphthene		1	10	2.13	0	0	0.00	0.00	0.00	0.00	9999999	9999999	9999999	9999999	
204	59. Acenaphthylene		1	10	2.13	0	0	0.00	0.00	0.00	0.00	9999999	9999999	9999999	9999999	
205	60. Anthracene		1	10	2.13	0	0	0.00	0.00	0.00	0.00	9999999	9999999	9999999	9999999	
206	61. Benzidine		1	50	2.13	0	0	0.00	0.00	0.00	0.00	9999999	9999999	9999999	9999999	
207	62. Benzo(a) anthracene		1	5	2.13	0	0	0.00	0.00	0.00	0.00	9999999	9999999	9999999	9999999	
208	63. Benzo(a) pyrene		1	5	2.13	0	0	0.00	0.00	0.00	0.00	9999999	9999999	9999999	9999999	
209	64. 3,4-benzoflouranthene		1	10	2.13	0	0	0.00	0.00	0.00	0.00	9999999	9999999	9999999	9999999	
210	65. Benzo(g,h,i)perylene		1	20	2.13	0	0	0.00	0.00	0.00	0.00	9999999	9999999	9999999	9999999	
211	66. Benzo(k) fluoranthene		1	5	2.13	0	0	0.00	0.00	0.00	0.00	9999999	9999999	9999999	9999999	
212	67. Bis(2-chloroethoxy)meth		1	10	2.13	0	0	0.00	0.00	0.00	0.00	9999999	9999999	9999999	9999999	
213	68. Bis(2-chloroethyl) Ether		1	10	2.13	0	0	0.00	0.00	0.00	0.00	9999999	9999999	9999999	9999999	
214	69. Bis(2-Chloroisopropyl) e		1	10	2.13	0	0	0.00	0.00	0.00	0.00	9999999	9999999	9999999	9999999	
215	70. Bis(2-ethylhexyl)phthala		1	10	2.13	0	0	0.00	0.00	0.00	0.00	9999999	9999999	9999999	9999999	
216	71. 4-Bromophenyl phenyl e		1	10	2.13	0	0	0.00	0.00	0.00	0.00	9999999	9999999	9999999	9999999	
217	72. Butylbenzy phthalate		1	10	2.13	0	0	0.00	0.00	0.00	0.00	9999999	9999999	9999999	9999999	
218	73. 2-chloronaphthalene		1	10	2.13	0	0	0.00	0.00	0.00	0.00	9999999	9999999	9999999	9999999	
219	74. 4-chlorophenyl phenyl e		1	10	2.13	0	0	0.00	0.00	0.00	0.00	9999999	9999999	9999999	9999999	
220	75. Chrysene		1	5	2.13	0	0	0.00	0.00	0.00	0.00	9999999	9999999	9999999	9999999	
221	76. Dibenzo(a,h)anthracene		1	5	2.13	0	0	0.00	0.00	0.00	0.00	9999999	9999999	9999999	9999999	
222	77-79. Dichlorobenzene(1,2		1	10	2.13	0	0	0.00	0.00	0.00	0.00	9999999	9999999	9999999	9999999	
223	80. 3,3' Dichlorobenzidine		1	5	2.13	0	0	0.00	0.00	0.00	0.00	9999999	9999999	9999999	9999999	
224	81. Diethyl Phthalate		1	10	2.13	0	0	0.00	0.00	0.00	0.00	9999999	9999999	9999999	9999999	
225	82. Dimethyl phthalate		1	10	2.13	0	0	0.00	0.00	0.00	0.00	9999999	9999999	9999999	9999999	
226	83. Di-n-Butyl phthalate		1	10	2.13	0	0	0.00	0.00	0.00	0.00	9999999	9999999	9999999	9999999	
227	84. 2-4-Dinitrotoluene		1	10	2.13	0	0	0.00	0.00	0.00	0.00	9999999	9999999	9999999	9999999	
228	85. 2-6-Dinitrotoluene		1	10	2.13	0	0	0.00	0.00	0.00	0.00	9999999	9999999	9999999	9999999	
229	86. Di-n-octyl phthalate		1	10	2.13	0	0	0.00	0.00	0.00	0.00	9999999	9999999	9999999	9999999	
230	87. 1,2-diphenylhydrazine		1	20	2.13	0	0	0.00	0.00	0.00	0.00	9999999	9999999	9999999	9999999	
231	88. Fluoranthene		1	10	2.13	0	0	0.00	0.00	0.00	0.00	9999999	9999999	9999999	9999999	
232	89. Fluorene		1	10	2.13	0	0	0.00	0.00	0.00	0.00	9999999	9999999	9999999	9999999	
233	90. Hexachlorobenzene		1	5	2.13	0	0	0.00	0.00	0.00	0.00	9999999	9999999	9999999	9999999	
234	91. Hexachlorobutadiene		1	10	2.13	0	0	0.00	0.00	0.00	0.00	9999999	9999999	9999999	9999999	
235	92. Hexachlorocyclopentadi		1	10	2.13	0	0	0.00	0.00	0.00	0.00	9999999	9999999	9999999	9999999	
236	93. Hexachloroethane		1	20	2.13	0	0	0.00	0.00	0.00	0.00	9999999	9999999	9999999	9999999	
237	Hexachlorocyclohexane		1		2.13	0	0	0.00	0.00	0.00	0.00	9999999	2	0.08	0.0373	
238	94. Indeno(1,2,3-cd)pyrene		1	5	2.13	0	0	0.00	0.00	0.00	0.00	9999999	9999999	9999999	9999999	

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	
279	STEP 3:	APPLICABLE WATER QUALITY-BASED LIMITS															
280																	
281																	
282								ADEQ HUMAN HEALTH CRITERIA									
283	POLLUTANTS		Permit Daily Maximum	Permit Monthly Average	Permit Daily Maximum	Permit Monthly Average		Permit Daily Maximum	Permit Monthly Average	Permit Daily Maximum	Permit Monthly Average						
284			ug/l	ug/l	lb/day	lb/day		ug/l	ug/l	lb/day	lb/day						
285	Alpha-BHC		NO	NO	NO	NO		NO	NO	NO	NO						
286	Beta-BHC		NO	NO	NO	NO											
287	Gamma-BHC		NO	NO	NO	NO											
288	Delta-BHC		NO	NO	NO	NO											
289	Pentachlorophenol		NO	NO	NO	NO											
290	Aldrin		NO	NO	NO	NO											
291	Chlordane		NO	NO	NO	NO		NO	NO	NO	NO						
292	4,4'-DDT		NO	NO	NO	NO											
293	4,4'-DDE		NO	NO	NO	NO											
294	4,4'-DDD		NO	NO	NO	NO											
295	Dieldrin		NO	NO	NO	NO		NO	NO	NO	NO						
296	Alpha-endosulfan		NO	NO	NO	NO											
297	Beta-endosulfan		NO	NO	NO	NO											
298	Endosulfan sulfate		NO	NO	NO	NO											
299	Endrin		NO	NO	NO	NO											
300	Endrin aldehyde		NO	NO	NO	NO											
301	Heptachlor		NO	NO	NO	NO											
302	Heptachlor epoxide		NO	NO	NO	NO											
303	Toxaphene		NO	NO	NO	NO		NO	NO	NO	NO						
304	Chlorpyrifos		NO	NO	NO	NO											
305	Cadmium Total		NO	NO	NO	NO											
306	Chromium (hex)		NO	NO	NO	NO											
307	Copper Total		NO	NO	NO	NO											
308	Lead Total		NO	NO	NO	NO											
309	Mercury Total		NO	NO	NO	NO											
310	Nickel Total		NO	NO	NO	NO											
311	Selenium Total		NO	NO	NO	NO											
312	Silver Total		NO	NO	NO	NO											
313	Zinc Total		NO	NO	NO	NO											
314	Chromium (Tri)		NO	NO	NO	NO											
315	Cyanide Total		NO	NO	NO	NO											
316	Beryllium Total		NO	NO	NO	NO		NO	NO	NO	NO						
317	PCB-1242		NO	NO	NO	NO		NO	NO	NO	NO						
318	PCB-1254		NO	NO	NO	NO		NO	NO	NO	NO						
319	PCB-1221		NO	NO	NO	NO		NO	NO	NO	NO						
320	PCB-1232		NO	NO	NO	NO		NO	NO	NO	NO						
321	PCB-1248		NO	NO	NO	NO		NO	NO	NO	NO						
322	PCB-1260		NO	NO	NO	NO		NO	NO	NO	NO						
323	PCB-1016		NO	NO	NO	NO		NO	NO	NO	NO						
324	2-3-7-8-TCDD		NO	NO	NO	NO		NO	NO	NO	NO						