Contaminant Load Model

Version MAY06

Auckland Regional Council
TE RAUHITANGA TAIAO

SOURCE	Site area (m^2)		6983848	Source contaminant management train				Contaminant yields, loads, and load reduction efficiencies															
								Sediment				Zinc				Copper				Total Petroleum Hydrocarbons			
	SOURCE TYPE		Source Area (m^2)	First management option	Second management option	Third management option	Fraction of area draining to train	Yield (g $m^{-2}a^{-1}$)	Initial load (g a^{-1})	Load reduction efficiency	Reduced load (g a^{-1})	Yield (g $m^{-2}a^{-1}$)	Initial load (g a^{-1})	Load reduction efficiency	Reduced load (g a^{-1})	Yield (g $m^{-2}a^{-1}$)	Initial load (g a^{-1})	Load reduction efficiency	Reduced load (g a^{-1})	Yield (g $m^{-2}a^{-1}$)	Initial load (g a^{-1})	Load reduction efficiency	Reduced load (g a^{-1})
Roofs	Galvanised unpainted		3370					5	16850	0.00	16850	2.200	7414.0	0.00	7414.00	0.0008	2.7	0.00	2.7				
	Galvanised steel poor paint		6450					5	32250	0.00	32250	1.600	10320.0	0.00	10320.00	0.0008	5.2	0.00	5.2				
	Galvanised well painted		5272					5	26360	0.00	26360	0.150	790.8	0.00	790.80	0.0008	4.2	0.00	4.2				
	Zinc/aluminium unpainted		358.1					5	1791	0.00	1791	0.300	107.4	0.00	107.43	0.0008	0.3	0.00	0.3				
	Colorsteel/colorcote		42532					5	212660	0.00	212660	0.040	1701.3	0.00	1701.28	0.0008	34.0	0.00	34.0				
	Concrete							10	0	0.00	0	0.020	0.0	0.00	0.00	0.0013	0.0	0.00	0.0				
	Clay							5	0	0.00	0	0.020	0.0	0.00	0.00	0.0008	0.0	0.00	0.0				
	Slate							5	0	0.00	0	0.020	0.0	0.00	0.00	0.0008	0.0	0.00	0.0				
	Copper							5	0	0.00	0	0.000	0.0	0.00	0.00	3.0000	0.0	0.00	0.0				
	Decramastic		21087					5	105435	0.00	105435	0.200	4217.4	0.00	4217.40	0.0017	35.8	0.00	35.8				
	Other materials		139036					5	695180	0.00	695180	0.020	2780.7	0.00	2780.72	0.0008	111.2	0.00	111.2				
	Unknown (no galvanised steel/copper)							7	0	0.00	0	0.200	0.0	0.00	0.00	0.0008	0.0	0.00	0.0				
Roads		*Length (m)*																					
	<1000	10862	184652					4	738610	0.00	738610	0.021	3964.6	0.00	3964.60	0.0070	1288.5	0.00	1288.5	0.11	19823.0	0.00	19823.0
	1000-500	379	6449					30	193855	0.00	193855	0.107	692.3	0.00	692.34	0.0349	225.0	0.00	225.0	0.54	3461.7	0.00	3461.7
Vehicles/day	5000-20000	1575	26767					150	4022909	0.00	4022909	0.537	14367.5	0.00	14367.53	0.1744	4669.4	0.00	4669.4	2.68	71837.7	0.00	71837.7
	20000-50	2234	45799					299	13699501	0.00	13699501	1.068	48926.8	0.00	48926.79	0.3472	15901.2	0.00	15901.2	5.34	244633.9	0.00	244633.9
	50000-100000		0					300	0	0.00	0	2.281	0.0	0.00	0.00	0.7414	0.0	0.00	0.0	11.41	0.0	0.00	0.0
	>100000		0					300	0	0.00	0	3.532	0.0	0.00	0.00	1.1480	0.0	0.00	0.0	17.66	0.0	0.00	0.0
Paved Surfaces other than roads	Residential		773429					20	15468576	0.00	15468576	0.070	54140.0	0.00	54140.01	0.0100	7734.3	0.00	7734.3				
	Industrial		3278					50	163899	0.00	163899	0.100	327.8	0.00	327.80	0.1300	426.1	0.00	426.1				
	Commercial		6389					100	638931	0.00	638931	0.050	319.5	0.00	319.47	0.0500	319.5	0.00	319.5				
Urban Grass lands		<10	963912					35	33736911	0.00	33736911				1180.8				236.2				
	Slope	10-20						80	0	0.00	0				0.0				0.0				
		>20						160	0	0.00	0				0.0				0.0				
Urban Stream Channel	*length x width*							6000	0	0.00	0				0.0				0.0				
	Urban area without construction sites		**2228780.438**					**Totals**	**69753716**	**0.00**	**69753716**	**Totals**	**150070.2**	**-0.01**	**151251.0**	**Totals**	**30757.5**	**-0.01**	**30993.7**	**Totals**	**339756.3**	**0.00**	**339756.3**
Construction Site (1) open for 2 months/year		<10						400	0	0.00	0				0.0				0.0				
	Slope	10-20						2500	0	0.00	0				0.0				0.0				
		>20						7000	0	0.00	0				0.0				0.0				
Construction Site (2) open for 6 months/year		<10						1300	0	0.00	0				0.0				0.0				
	Slope	10-20						7500	0	0.00	0				0.0				0.0				
		>20						20000	0	0.00	0				0.0				0.0				
Construction Site (3) open for 12 months/year		<10						2500	0	0.00	0				0.0				0.0				
	Slope	10-20						15000	0	0.00	0				0.0				0.0				
		>20						40000	0	0.00	0				0.0				0.0				
	Urban area with construction sites		**2228780**					**Totals**	**69753716**	**0.00**	**69753716**	**Totals**	**150070.2**	**-0.01**	**151251.0**	**Totals**	**30757.5**	**-0.01**	**30993.7**	**Totals**	**339756.3**	**0.00**	**339756.3**
Exotic production forest		<10	37146					10	371463	0.00	371463				13.0				2.6				
		10-20	9543					60	572581	0.00	572581				20.0				4.0				
	Slope	20-30	13					200	2539	0.00	2539				0.1				0.0				
		>30	0					500	0	0.00	0				0.0				0.0				
Stable bush		<10	475035					5	2375175	0.00	2375175				83.1				16.6				
		10-20	320194					30	9605810	0.00	9605810				336.2				67.2				
	Slope	20-30	563462					100	56346204	0.00	56346204				1972.1				394.4				
		>30	1282338					250	320584511	0.00	320584511				11220.5				2244.1				
Farmed pasture		<10	1728924					50	86446200	0.00	86446200				3025.6				605.1				
		10-20	322730					100	32273000	0.00	32273000				1129.6				225.9				
	Slope	20-30	12488					500	6244132	0.00	6244132				218.5				43.7				
		>30	3195					1000	3195005	0.00	3195005				111.8				22.4				
Retired pasture		<10						20	0	0.00	0				0.0				0.0				
		10-20						100	0	0.00	0				0.0				0.0				
	Slope	20-30						200	0	0.00	0				0.0				0.0				
		>30						500	0	0.00	0				0.0				0.0				
Horticulture		Volcanic						50	0	0.00	0				0.0				0.0				
	Soil type	Sediment						100	0	0.00	0				0.0				0.0				
		Unknown						100	0	0.00	0				0.0				0.0				
	Total area of sources (m^2)		**6983849**					**Site totals**	**587770337**	**0.00**	**587770337**	**Site totals**	**150070.2**	**-0.13**	**169381.5**	**Site totals**	**30757.5**	**-0.13**	**34619.8**	**Site totals**	**339756.3**	**0.00**	**339756.3**

ERROR!!! Site and source area's do not agree

Difference = 0

Bottom of Site contaminant management train				Bottom of Site out-fall Loads (kg a^{-1})				Average yields				Average concentrations (mg kg^{-1})			
First management option	Second management option	Third management option	Fraction of area draining to train	TSS	Zn	Cu	TPH	TSS kg ha^{-1} a^{-1}	Zn g ha^{-1} a^{-1}	Cu g ha^{-1} a^{-1}	TPH g ha^{-1} a^{-1}	TSS	Zn	Cu	TPH
				587770.3	169.4	34.6	339.8	842	243	50	486		288	59	578

Kakariki Stream Sub-Catchment
- Existing

Contaminant Load Model

Version MAY06

Auckland Regional Council
TE RAUHITANGA TAIAO

SOURCE	Site area (m^2)		6983848	Source contaminant management train				Contaminant yields, loads, and load reduction efficiencies															
								Sediment				Zinc				Copper				Total Petroleum Hydrocarbons			
	SOURCE TYPE		Source Area (m^2)	First management option	Second management option	Third management option	Fraction of area draining to train	Yield (g $m^{-2}a^{-1}$)	Initial load (g a^{-1})	Load reduction efficiency	Reduced load (g a^{-1})	Yield (g $m^{-2}a^{-1}$)	Initial load (g a^{-1})	Load reduction efficiency	Reduced load (g a^{-1})	Yield (g $m^{-2}a^{-1}$)	Initial load (g a^{-1})	Load reduction efficiency	Reduced load (g a^{-1})	Yield (g $m^{-2}a^{-1}$)	Initial load (g a^{-1})	Load reduction efficiency	Reduced load (g a^{-1})
Roofs	Galvanised unpainted		3370					5	16850	0.00	16850	2.200	7414.1	0.00	7414.06	0.0008	2.7	0.00	2.7				
	Galvanised steel poor paint		6450					5	32250	0.00	32250	1.600	10320.0	0.00	10320.04	0.0008	5.2	0.00	5.2				
	Galvanised well painted		5272					5	26359	0.00	26359	0.150	790.8	0.00	790.77	0.0008	4.2	0.00	4.2				
	Zinc/aluminium unpainted		358					5	1791	0.00	1791	0.300	107.4	0.00	107.43	0.0008	0.3	0.00	0.3				
	Colorsteel/colorcote		42533					5	212663	0.00	212663	0.040	1701.3	0.00	1701.30	0.0008	34.0	0.00	34.0				
	Concrete							10	0	0.00	0	0.020	0.0	0.00	0.00	0.0013	0.0	0.00	0.0				
	Clay							5	0	0.00	0	0.020	0.0	0.00	0.00	0.0008	0.0	0.00	0.0				
	Slate							5	0	0.00	0	0.020	0.0	0.00	0.00	0.0008	0.0	0.00	0.0				
	Copper							5	0	0.00	0	0.000	0.0	0.00	0.00	3.0000	0.0	0.00	0.0				
	Decramastic		21087					5	105436	0.00	105436	0.200	4217.4	0.00	4217.44	0.0017	35.8	0.00	35.8				
	Other materials		139036					5	695182	0.00	695182	0.020	2780.7	0.00	2780.73	0.0008	111.2	0.00	111.2				
	Unknown (no galvanised steel/copper)							7	0	0.00	0	0.200	0.0	0.00	0.00	0.0008	0.0	0.00	0.0				
Roads		*Length (m)*																					
	<1000	10862	184652					4	738610	0.00	738610	0.021	3964.6	0.00	3964.60	0.0070	1288.5	0.00	1288.5	0.11	19823.0	0.00	19823.0
	1000-500	379	6449					30	193855	0.00	193855	0.107	692.3	0.00	692.34	0.0349	225.0	0.00	225.0	0.54	3461.7	0.00	3461.7
Vehicles/day	5000-20000	5136	87308					150	13121843	0.00	13121843	0.537	46863.7	0.00	46863.72	0.1744	15230.7	0.00	15230.7	2.68	234318.6	0.00	234318.6
	20000-50000		0					299	0	0.00	0	1.068	0.0	0.00	0.00	0.3472	0.0	0.00	0.0	5.34	0.0	0.00	0.0
	50000-100000		0					300	0	0.00	0	2.281	0.0	0.00	0.00	0.7414	0.0	0.00	0.0	11.41	0.0	0.00	0.0
	>100000		0					300	0	0.00	0	3.532	0.0	0.00	0.00	1.1480	0.0	0.00	0.0	17.66	0.0	0.00	0.0
Paved Surfaces other than roads	Residential		776845					20	15536895	0.00	15536895	0.070	54379.1	0.00	54379.13	0.0100	7768.4	0.00	7768.4				
	Industrial		3278					50	163899	0.00	163899	0.100	327.8	0.00	327.80	0.1300	426.1	0.00	426.1				
	Commercial		6389					100	638931	0.00	638931	0.050	319.5	0.00	319.47	0.0500	319.5	0.00	319.5				
Urban Grass lands		<10	963912					35	33736911	0.00	33736911				1180.8				236.2				
	Slope	10-20						80	0	0.00	0				0.0				0.0				
		>20						160	0	0.00	0				0.0				0.0				
Urban Stream Channel	*length x width*							6000	0	0.00	0				0.0				0.0				
	Urban area without construction sites		**2246939.108**					**Totals**	**65221473**	**0.00**	**65221473**	**Totals**	**133878.8**	**-0.01**	**135059.6**	**Totals**	**25451.7**	**-0.01**	**25687.9**	**Totals**	**257603.3**	**0.00**	**257603.3**
Construction Site (1) open for 2 months/year		<10						400	0	0.00	0				0.0				0.0				
	Slope	10-20						2500	0	0.00	0				0.0				0.0				
		>20						7000	0	0.00	0				0.0				0.0				
Construction Site (2) open for 6 months/year		<10						1300	0	0.00	0				0.0				0.0				
	Slope	10-20						7500	0	0.00	0				0.0				0.0				
		>20						20000	0	0.00	0				0.0				0.0				
Construction Site (3) open for 12 months/year		<10						2500	0	0.00	0				0.0				0.0				
	Slope	10-20						15000	0	0.00	0				0.0				0.0				
		>20						40000	0	0.00	0				0.0				0.0				
	Urban area with construction sites		**2246939**					**Totals**	**65221473**	**0.00**	**65221473**	**Totals**	**133878.8**	**-0.01**	**135059.6**	**Totals**	**25451.7**	**-0.01**	**25687.9**	**Totals**	**257603.3**	**0.00**	**257603.3**
Exotic production forest		<10	37146					10	371463	0.00	371463				13.0				2.6				
		10-20	9468					60	568101	0.00	568101				19.9				4.0				
	Slope	20-30	13					200	2539	0.00	2539				0.1				0.0				
		>30	0					500	0	0.00	0				0.0				0.0				
Stable bush		<10	475035					5	2375175	0.00	2375175				83.1				16.6				
		10-20	320194					30	9605810	0.00	9605810				336.2				67.2				
	Slope	20-30	563462					100	56346204	0.00	56346204				1972.1				394.4				
		>30	1282338					250	320584511	0.00	320584511				11220.5				2244.1				
Farmed pasture		<10	1728923					50	86446150	0.00	86446150				3025.6				605.1				
		10-20	304647					100	30464691	0.00	30464691				1066.3				213.3				
	Slope	20-30	12488					500	6244132	0.00	6244132				218.5				43.7				
		>30	3195					1000	3195005	0.00	3195005				111.8				22.4				
Retired pasture		<10						20	0	0.00	0				0.0				0.0				
		10-20						100	0	0.00	0				0.0				0.0				
	Slope	20-30						200	0	0.00	0				0.0				0.0				
		>30						500	0	0.00	0				0.0				0.0				
Horticulture		Volcanic						50	0	0.00	0				0.0				0.0				
	Soil type	Sediment						100	0	0.00	0				0.0				0.0				
		Unknown						100	0	0.00	0				0.0				0.0				
	Total area of sources (m^2)		**6983848**					**Site totals**	**581425253**	**0.00**	**581425253**	**Site totals**	**133878.8**	**-0.14**	**153126.7**	**Site totals**	**25451.7**	**-0.15**	**29301.3**	**Site totals**	**257603.3**	**0.00**	**257603.3**

ERROR!!! Site and source area's do not agree
Difference = 0

Bottom of Site contaminant management train				Bottom of Site out-fall Loads (kg a^{-1})				Average yields				Average concentrations (mg kg^{-1})			
First management option	Second management option	Third management option	Fraction of area draining to train	TSS	Zn	Cu	TPH	TSS kg ha^{-1} a^{-1}	Zn g ha^{-1} a^{-1}	Cu g ha^{-1} a^{-1}	TPH g ha^{-1} a^{-1}	TSS	Zn	Cu	TPH
				581425.3	153.1	29.3	257.6	833	219	42	369		263	50	443

Kakariki Stream Sub-Catchment
- Future (2031) with Expressway
- Unmitigated

Contaminant Load Model

Version MAY06

Auckland Regional Council
TE RAUHITANGA TAIAO

SOURCE	Site area (m^2)		6983848	Source contaminant management train				Contaminant yields, loads, and load reduction efficiencies															
								Sediment				Zinc				Copper				Total Petroleum Hydrocarbons			
	SOURCE TYPE		Source Area (m^2)	First management option	Second management option	Third management option	Fraction of area draining to train	Yield (g $m^{-2}a^{-1}$)	Initial load (g a^{-1})	Load reduction efficiency	Reduced load (g a^{-1})	Yield (g $m^{-2}a^{-1}$)	Initial load (g a^{-1})	Load reduction efficiency	Reduced load (g a^{-1})	Yield (g $m^{-2}a^{-1}$)	Initial load (g a^{-1})	Load reduction efficiency	Reduced load (g a^{-1})	Yield (g $m^{-2}a^{-1}$)	Initial load (g a^{-1})	Load reduction efficiency	Reduced load (g a^{-1})
Roofs	Galvanised unpainted		3370					5	16850	0.00	16850	2.200	7414.1	0.00	7414.06	0.0008	2.7	0.00	2.7				
	Galvanised steel poor paint		6450					5	32250	0.00	32250	1.600	10320.0	0.00	10320.04	0.0008	5.2	0.00	5.2				
	Galvanised well painted		5272					5	26359	0.00	26359	0.150	790.8	0.00	790.77	0.0008	4.2	0.00	4.2				
	Zinc/aluminium unpainted		358					5	1791	0.00	1791	0.300	107.4	0.00	107.43	0.0008	0.3	0.00	0.3				
	Colorsteel/colorcote		42533					5	212663	0.00	212663	0.040	1701.3	0.00	1701.30	0.0008	34.0	0.00	34.0				
	Concrete							10	0	0.00	0	0.020	0.0	0.00	0.00	0.0013	0.0	0.00	0.0				
	Clay							5	0	0.00	0	0.020	0.0	0.00	0.00	0.0008	0.0	0.00	0.0				
	Slate							5	0	0.00	0	0.020	0.0	0.00	0.00	0.0008	0.0	0.00	0.0				
	Copper							5	0	0.00	0	0.000	0.0	0.00	0.00	3.0000	0.0	0.00	0.0				
	Decramastic		21087					5	105436	0.00	105436	0.200	4217.4	0.00	4217.44	0.0017	35.8	0.00	35.8				
	Other materials		139036					5	695182	0.00	695182	0.020	2780.7	0.00	2780.73	0.0008	111.2	0.00	111.2				
	Unknown (no galvanised steel/copper)							7	0	0.00	0	0.200	0.0	0.00	0.00	0.0008	0.0	0.00	0.0				
Roads		*Length (m)*																					
	<1000	10862	184652					4	738610	0.00	738610	0.021	3964.6	0.00	3964.60	0.0070	1288.5	0.00	1288.5	0.11	19823.0	0.00	19823.0
	1000-500	379	6449					30	193855	0.00	193855	0.107	692.3	0.00	692.34	0.0349	225.0	0.00	225.0	0.54	3461.7	0.00	3461.7
	Vehicles/day 5000-20000	5136	87308	Swale			0.26	150	13121843	0.75	10563084	0.537	46863.7	0.47	41136.98	0.1744	15230.7	0.57	12973.5	2.68	234318.6	0.47	205684.9
	20000-50000		0					299	0	0.00	0	1.068	0.0	0.00	0.00	0.3472	0.0	0.00	0.0	5.34	0.0	0.00	0.0
	50000-100000		0					300	0	0.00	0	2.281	0.0	0.00	0.00	0.7414	0.0	0.00	0.0	11.41	0.0	0.00	0.0
	>100000		0					300	0	0.00	0	3.532	0.0	0.00	0.00	1.1480	0.0	0.00	0.0	17.66	0.0	0.00	0.0
Paved Surfaces other than roads	Residential		776845					20	15536895	0.00	15536895	0.070	54379.1	0.00	54379.13	0.0100	7768.4	0.00	7768.4				
	Industrial		3278					50	163899	0.00	163899	0.100	327.8	0.00	327.80	0.1300	426.1	0.00	426.1				
	Commercial		6389					100	638931	0.00	638931	0.050	319.5	0.00	319.47	0.0500	319.5	0.00	319.5				
Urban Grass lands		<10	963912					35	33736911	0.00	33736911				1180.8				236.2				
	Slope	10-20						80	0	0.00	0				0.0				0.0				
		>20						160	0	0.00	0				0.0				0.0				
Urban Stream Channel	*length x width*							6000	0	0.00	0				0.0				0.0				
	Urban area without construction sites		**2246939.108**					**Totals**	**65221473**	**0.04**	**62662713**	**Totals**	**133878.8**	**0.03**	**129332.9**	**Totals**	**25451.7**	**0.08**	**23430.7**	**Totals**	**257603.3**	**0.11**	**228969.6**
Construction Site (1) open for 2 months/year		<10						400	0	0.00	0				0.0				0.0				
	Slope	10-20						2500	0	0.00	0				0.0				0.0				
		>20						7000	0	0.00	0				0.0				0.0				
Construction Site (2) open for 6 months/year		<10						1300	0	0.00	0				0.0				0.0				
	Slope	10-20						7500	0	0.00	0				0.0				0.0				
		>20						20000	0	0.00	0				0.0				0.0				
Construction Site (3) open for 12 months/year		<10						2500	0	0.00	0				0.0				0.0				
	Slope	10-20						15000	0	0.00	0				0.0				0.0				
		>20						40000	0	0.00	0				0.0				0.0				
	Urban area with construction sites		**2246939**					**Totals**	**65221473**	**0.04**	**62662713**	**Totals**	**133878.8**	**0.03**	**129332.9**	**Totals**	**25451.7**	**0.08**	**23430.7**	**Totals**	**257603.3**	**0.11**	**228969.6**
Exotic production forest		<10	37146					10	371463	0.00	371463				13.0				2.6				
		10-20	9468					60	568101	0.00	568101				19.9				4.0				
	Slope	20-30	13					200	2539	0.00	2539				0.1				0.0				
		>30	0					500	0	0.00	0				0.0				0.0				
Stable bush		<10	475035					5	2375175	0.00	2375175				83.1				16.6				
		10-20	320194					30	9605810	0.00	9605810				336.2				67.2				
	Slope	20-30	563462					100	56346204	0.00	56346204				1972.1				394.4				
		>30	1282338					250	320584511	0.00	320584511				11220.5				2244.1				
Farmed pasture		<10	1728923					50	86446150	0.00	86446150				3025.6				605.1				
		10-20	304647					100	30464691	0.00	30464691				1066.3				213.3				
	Slope	20-30	12488					500	6244132	0.00	6244132				218.5				43.7				
		>30	3195					1000	3195005	0.00	3195005				111.8				22.4				
Retired pasture		<10						20	0	0.00	0				0.0				0.0				
		10-20						100	0	0.00	0				0.0				0.0				
	Slope	20-30						200	0	0.00	0				0.0				0.0				
		>30						500	0	0.00	0				0.0				0.0				
Horticulture		Volcanic						50	0	0.00	0				0.0				0.0				
	Soil type	Sediment						100	0	0.00	0				0.0				0.0				
		Unknown						100	0	0.00	0				0.0				0.0				
	Total area of sources (m^2)		**6983848**					**Site totals**	**581425253**	**0.00**	**578866494**	**Site totals**	**133878.8**	**-0.10**	**147400.0**	**Site totals**	**25451.7**	**-0.06**	**27044.1**	**Site totals**	**257603.3**	**0.11**	**228969.6**

ERROR!!! Site and source area's do not agree
Difference = 0

Bottom of Site contaminant management train				Bottom of Site out-fall Loads (kg a^{-1})				Average yields				Average concentrations (mg kg^{-1})			
First management option	Second management option	Third management option	Fraction of area draining to train	TSS	Zn	Cu	TPH	TSS kg ha^{-1} a^{-1}	Zn g ha^{-1} a^{-1}	Cu g ha^{-1} a^{-1}	TPH g ha^{-1} a^{-1}	TSS	Zn	Cu	TPH
				578866.5	147.4	27.0	229.0	829	211	39	328		255	47	396

Kakariki Stream Sub-Catchment
- Future (2031) with Expressway
- Mitigated