Table 1. Effects of chemical contaminants from the Hylebos Waterway on growth of juvenile chinook salmon. Concentrations of selected aromatic hydrocarbons, chlorinated butadienes, pesticides, and polychlorinated biphenyls in sediment extract from the Nisqually River (NQSE) that was used in the laboratory experiment. Values are reported as ng/g sediment.

Analyte	ng/g sediment[a]	Analyte	ng/g sediment
Aromatic Hydrocarbons		Pesticides	
naphthalene	1	hexachlorobenzene	< 0.02
2-methylnaphthalene	1	lindane (gamma-BHC)	< 0.039
1-methylnaphthalene	1	heptachlor	0.035
biphenyl	< 0.2	aldrin	< 0.029
2,6-dimethylnaphthalene	1	heptachlorepoxide	< 0.024
acenaphthylene	< 0.2	oxychlordane	< 0.03
acenaphthene	< 0.3	trans-chlordane	0.16
2,3,5-trimethylnaphthalene	2	nonachlor-III	n/a
fluorene	< 0.3	alpha-chlordane	< 0.02
phenanthrene	2	trans-nonachlor	< 0.018
anthracene	< 0.2	cis-nonachlor	< 0.028
1-methylphenanthrene	1	dieldrin	< 0.023
fluoranthene	1	mirex	< 0.016
pyrene	1	o,p'-DDE	< 0.04
benz[a]anthracene	0.4	p,p'-DDE	0.32
chrysene	0.8	o,p'-DDD	< 0.038
benzo[b]fluoranthene	0.5	p,p'-DDD	0.098
benzo[k]fluoranthene	< 0.2	o,p'-DDT	< 0.015
benzo[e]pyrene	0.4	p,p'-DDT	0.056
benzo[a]pyrene	< 0.2		
perylene	2	PCBs	
indeno[1,2,3-cd]pyrene	< 0.2	trichlorobiphenyl - 18	< 0.053
dibenz[a,h]anthracene	< 0.2	trichlorobiphenyl - 28	0.13
benzo[g,h,i]perylene	0.3	tetrachlorobiphenyl - 44	0.11
dibenzothiophene	< 0.2	tetrachlorobiphenyl - 52	< 0.037
		tetrachlorobiphenyl - 66	0.067
		pentachlorobiphenyl - 101	0.039
Chlorinated Butadienes[b]		pentachlorobiphenyl - 105	< 0.023
Trichlorobutadiene	<0.05	pentachlorobiphenyl - 118	< 0.025
Tetrachlorobutadiene	<0.05	hexachlorobiphenyl - 128	< 0.019
Pentachlorobutadiene	<0.05	hexachlorobiphenyl - 138	0.19
Hexachlorobutadiene	<0.05	hexachlorobiphenyl - 153	0.13
		heptachlorobiphenyl - 170	0.084
		heptachlorobiphenyl - 180	0.14
		heptachlorobiphenyl - 187	0.037
		octachlorobiphenyl - 195	< 0.013
		nonachlorobiphenyl - 206	0.017
		decachlorobiphenyl - 209	0.088

[a] Concentrations were calculated on a wet weight basis where 1 µl of the bulk extract corresponds to 0.2 g of sediment.

[b] Concentrations of the butadienes were calculated using a response factor of 1 with GC/MS total ion current areas.

Table 2. Effects of chemical contaminants from the Hylebos Waterway on growth of juvenile chinook salmon. Concentrations of selected aromatic hydrocarbons, chlorinated butadienes, pesticides, and polychlorinated biphenyls in sediment extract from the Hylebos Waterway (HWSE-M) that was used in the laboratory experiment. Values are reported as ng/g sediment.

Analyte	ng/g sediment[a]	Analyte	ng/g sediment
Aromatic Hydrocarbons		Pesticides	
naphthalene	46	hexachlorobenzene	140
2-methylnaphthalene	22	lindane (gamma-BHC)	3.2
1-methylnaphthalene	14	heptachlor	5
biphenyl	8	aldrin	1.6
2,6-dimethylnaphthalene	14	heptachlorepoxide	30
acenaphthylene	3	oxychlordane	1.2
acenaphthene	25	trans-chlordane	6.5
2,3,5-trimethylnaphthalene	9	nonachlor-III	n/a
fluorene	32	alpha-chlordane	2.6
phenanthrene	130	trans-nonachlor	5.0
anthracene	41	cis-nonachlor	1.1
1-methylphenanthrene	17	dieldrin	1.3
fluoranthene	180	mirex	2.1
pyrene	150	o,p'-DDE	1.7
benz[a]anthracene	65	p,p'-DDE	0.46
chrysene	99	o,p'-DDD	7.2
benzo[b]fluoranthene	72	p,p'-DDD	4.1
benzo[k]fluoranthene	52	o,p'-DDT	9.9
benzo[e]pyrene	49	p,p'-DDT	< 0.0097
benzo[a]pyrene	48		
perylene	18	PCBs	
indeno[1,2,3-cd]pyrene	28	trichlorobiphenyl - 18	2.5
dibenz[a,h]anthracene	9	trichlorobiphenyl - 28	5.8
benzo[g,h,i]perylene	31	tetrachlorobiphenyl - 44	2.3
dibenzothiophene	34	tetrachlorobiphenyl - 52	4.6
		tetrachlorobiphenyl - 66	5.1
		pentachlorobiphenyl - 101	4.0
Chlorinated Butadienes[b]		pentachlorobiphenyl - 105	1.1
Trichlorobutadiene	520	pentachlorobiphenyl - 118	4.8
Tetrachlorobutadiene	590	hexachlorobiphenyl - 128	1.8
Pentachlorobutadiene	170	hexachlorobiphenyl - 138	4.7
Hexachlorobutadiene	130	hexachlorobiphenyl - 153	4.9
		heptachlorobiphenyl - 170	2.6
		heptachlorobiphenyl - 180	10
		heptachlorobiphenyl - 187	2.9
		octachlorobiphenyl - 195	2.7
		nonachlorobiphenyl - 206	15
		decachlorobiphenyl - 209	34

[a] Concentrations were calculated on a wet weight basis where 1 µl of the bulk extract corresponds to 0.2 g of sediment.

[b] Concentrations of the butadienes were calculated using a response factor of 1 with GC/MS total ion current areas.

Table 3. Effects of chemical contaminants from the Hylebos Waterway on growth of juvenile chinook salmon. Concentrations of selected aromatic hydrocarbons, chlorinated butadienes, pesticides, and polychlorinated biphenyls in sediment extract from the pentane extraction of sediment from the Hylebos Waterway (HWSE-P) that was used in the laboratory experiment. Values are reported as ng/g sediment.

Analyte	ng/g sediment[a]	Analyte	ng/g sediment
Aromatic Hydrocarbons		Pesticides	
naphthalene	26	hexachlorobenzene	110
2-methylnaphthalene	18	lindane (gamma-BHC)	2.0
1-methylnaphthalene	10	heptachlor	0.8
biphenyl	6	aldrin	< 0.06
2,6-dimethylnaphthalene	10	heptachlorepoxide	21
acenaphthylene	0.9	oxychlordane	< 0.07
acenaphthene	28	trans-chlordane	< 0.06
2,3,5-trimethylnaphthalene	28	nonachlor-III	< 0.06
fluorene	28	alpha-chlordane	2.0
phenanthrene	140	trans-nonachlor	5.0
anthracene	47	cis-nonachlor	0.4
1-methylphenanthrene	10	dieldrin	2.0
fluoranthene	170	mirex	2.0
pyrene	170	o,p'-DDE	1.0
benz[a]anthracene	23	p,p'-DDE	0.4
chrysene	33	o,p'-DDD	20
benzo[b]fluoranthene	6	p,p'-DDD	1.0
benzo[k]fluoranthene	5	o,p'-DDT	< 0.1
benzo[e]pyrene	9	p,p'-DDT	< 0.1
benzo[a]pyrene	10		
perylene	2	PCBs	
indeno[1,2,3-cd]pyrene	0.3	trichlorobiphenyl - 18	17
dibenz[a,h]anthracene	< 0.02	trichlorobiphenyl - 28	6.0
benzo[g,h,i]perylene	1.0	tetrachlorobiphenyl - 44	1.0
dibenzothiophene	12	tetrachlorobiphenyl - 52	3.0
		tetrachlorobiphenyl - 66	< 0.08
		pentachlorobiphenyl - 101	3.0
Chlorinated Butadienes[b]		pentachlorobiphenyl - 105	< 0.06
Trichlorobutadiene	480	pentachlorobiphenyl - 118	< 0.07
Tetrachlorobutadiene	450	hexachlorobiphenyl - 128	0.8
Pentachlorobutadiene	160	hexachlorobiphenyl - 138	2.0
Hexachlorobutadiene	150	hexachlorobiphenyl - 153	4.0
		heptachlorobiphenyl - 170	1.0
		heptachlorobiphenyl - 180	9.0
		heptachlorobiphenyl - 187	2.0
		octachlorobiphenyl - 195	2.0
		nonachlorobiphenyl - 206	12
		decachlorobiphenyl - 209	31

[a] Analyte concentrations calculated on a sediment wet weight basis.

[b] Concentrations of the butadienes were calculated using a response factor of 1 with GC/MS total ion current areas.

Table 4. Effects of chemical contaminants from the Hylebos Waterway on growth of juvenile chinook salmon. High molecular weight hydrocarbons that comprise the PAH model mixture. The compounds were combined in acetone at the same ratios as they were present in the sediment at station 24 of the Hylebos Waterway to a concentration equivalent to 400 g sediment extracted per ml of acetone.

PAH Analyte and concentration (ng/μl)			
Fluoranthene	5000	Benz[k]fluoranthene	1920
Pyrene	460	Benzo[a]pyrene	1540
Benz[a]anthracene	1640	Indeno[1,2,3-cd]pyrene	2400
Chrysene	3200	Dibenz[a,h]anthracene	220
Benz[b]fluoranthene	5000	Benzo[g,h,i]perylene	1880

Table 5. Effects of chemical contaminants from the Hylebos Waterway on growth of juvenile chinook salmon. Estimated average feeding rate per day (% body weight) for juvenile chinook salmon exposed for 60 days in Phase II experiment.

		% Body weight fed/day[a]	
Treatment	Tank	Average/Tank	Average/Treatment
Acetone/Emulphor	C	3.6	3.6
Acetone/Emulphor	L	3.6	
NQSE	I	3.5	3.6
NQSE	N	3.6	
Model PAH Mixture	E	3.7	3.7
Model PAH Mixture	M	3.7	
Aroclor 1254	A	3.7	3.7
Aroclor 1254	F	3.6	
HCBD	J	3.7	3.6
HCBD	P	3.7	
HWSE-M	G	3.6	3.6
HWSE-M	K	3.6	
HWSE-P	H	3.6	3.6
HWSE-P	O	3.6	

[a]Periodic adjustment of feed amounts were based on an estimated growth rate of 1 gram/fish/week.

Table 6. Effects of chemical contaminants from the Hylebos Waterway on growth of juvenile chinook salmon. Weekly mortality of juvenile chinook salmon various extracts in Phase II experiment.

		Week									
Treatment	Tank	1	2	3	4	5	6	7	8	9[a]	Total
Acetone/Emulphor	C	3	4	1	0	0	0	0	0	0	8
Acetone/Emulphor	L	0	7	1	0	0	0	0	1	0	9
NQSE	I	0	2	2	0	0	0	0	0	0	4
NQSE	N	1	2	2	1	0	0	1	0	0	7
Model PAH Mixture	E	1	13	3	0	0	0	0	0	0	17
Model PAH Mixture	M	1	9	7	1	1	0	0	0	0	19
Aroclor 1254	A	3	4	2	0	1	0	1	1	0	12
Aroclor 1254	F	4	4	5	0	0	0	0	0	0	13
HCBD	J	0	3	2	2	0	0	0	0	0	7
HCBD	P	0	3	3	0	0	1	0	0	0	7
HWSE-M	G	0	3	5	1	0	0	0	0	0	9
HWSE-M	K	3	2	2	0	0	1	0	0	0	8
HWSE-P	H	1	0	4	1	0	0	1	1	0	8
HWSE-P	O	0	2	1	0	0	0	0	0	0	3

[a] Mortalities recorded for week 9 only included the last 4 days of the experimental period.

Table 7. Effects of chemical contaminants from the Hylebos Waterway on growth of juvenile chinook salmon. Fork length (± SD) of juvenile chinook salmon (by treatment) at the beginning and end of a 60 day exposure in Phase II experiment.

	Day 0		Day 60	
Treatment	Sample size	Length (mm)	Sample size	Length (mm)
Acetone/Emulphor	200	94 ± 3	179	135 ± 7
NQSE	200	94 ± 3	183	135 ± 7
Model PAH Mixture	200	93 ± 3	155	135 ± 7
Aroclor 1254	200	94 ± 3	170	133 * ± 6
HCBD	200	94 ± 3	167	134 * ± 7
HWSE-M	200	93 * ± 3	177	133 * ± 6
HWSE-P	200	93 * ± 3	189	133 * ± 6

* Indicates value is significantly different (ANOVA $p \leq 0.05$, Dunnett's Multiple Comparison Test) than control (Acetone/Emulphor).

Table 8. Effects of chemical contaminants from the Hylebos Waterway on growth of juvenile chinook salmon. Weight (± SD) of juvenile chinook salmon (by treatment) at the beginning and end of a 60 day exposure in Phase II experiment.

	Day 0		Day 60	
Treatment	Sample size	Weight (g)	Sample size	Weight (g)
Acetone/Emulphor	200	8.2 ± 1.0	179	32.1 ± 5.4
NQSE	200	8.1 ± 1.0	183	32.0 ± 5.5
Model PAH Mixture	200	7.9 * ± 0.9	155	31.1 ± 5.5
Aroclor 1254	200	8.0 ± 0.9	170	29.6 * ± 4.8
HCBD	200	8.0 ± 1.0	167	30.8 ± 5.4
HWSE-M	200	7.9 * ± 0.9	177	29.9 * ± 4.4
HWSE-P	200	7.9 * ± 1.0	189	30.1 * ± 4.7

* Indicates value is significantly different (ANOVA $p \leq 0.05$, Dunnett's Multiple Comparison Test) than control (Acetone/Emulphor).

Table 9. Effects of chemical contaminants from the Hylebos Waterway on growth of juvenile chinook salmon. Fork length (± SD) of juvenile chinook salmon (by tank) at the beginning and end of a 60 day exposure in Phase II experiment.

		Day 0		Day 60	
Tank	Treatment	Sample size	Length (mm)	Sample size	Length (mm)
C	Acetone/Emulphor	100	94 ± 3	90	135 ± 6
L	Acetone/Emulphor	100	94 ±3	89	136 ± 7
I	NQSE	100	94 ± 3	95	136 ± 7
N	NQSE	100	94 ± 3	88	134 ± 7
E	Model PAH Mixture	100	94 ± 3	77	132 ± 7
M	Model PAH Mixture	100	93 ± 2.9	78	137 ± 7
A	Aroclor 1254	100	94 ± 3	84	135 ± 6
F	Aroclor 1254	100	94 ± 3	86	130 ± 6
J	HCBD	100	95 ± 3	84	131 ± 7
P	HCBD	100	94 ± 3	83	136 ± 6
K	HWSE	100	93 ± 3	89	133 ± 6
G	HWSE	100	93 ± 3	88	133 ± 6
H	HWSE-P	100	93 ± 4	90	132 ± 6
O	HWSE-P	100	93 ± 3	99	134 ± 6

Table 10. Effects of chemical contaminants from the Hylebos Waterway on growth of juvenile chinook salmon. Weight (± SD) of juvenile chinook salmon (by tank) at the beginning and end of a 60 day exposure in Phase II experiment.

		Day 0		Day 60	
Tank	Treatment	Sample size	Weight (g)	Sample size	Weight (g)
C	Acetone/Emulphor	100	8.3 ± 1.0	90	31.4 ± 4.9
L	Acetone/Emulphor	100	8.1 ± 1.0	89	32.8 ± 5.8
I	NQSE	100	8.2 ± 1.0	95	32.7 ± 5.5
N	NQSE	100	8.0 ± 1.0	88	31.3 ± 5.4
E	Model PAH Mixture	100	8.0 ± 1.0	77	29.2 ± 5.3
M	Model PAH Mixture	100	7.9 ± 0.9	78	33.0 ± 5.0
A	Aroclor 1254	100	7.9 ± 1.0	84	31.6 ± 4.7
F	Aroclor 1254	100	8.1 ± 0.9	86	27.6 ± 4.1
J	HCBD	100	8.2 ± 1.0	84	28.5 ± 5.2
P	HCBD	100	7.8 ± 1.0	83	33.1 ± 4.7
K	HWSE-M	100	7.9 ± 0.9	89	29.8 ± 4.5
G	HWSE-M	100	7.9 ± 1.0	88	30.1 ± 4.4
H	HWSE-P	100	7.9 ± 1.0	90	29.3 ± 4.8
O	HWSE-P	100	7.9 ± 0.9	99	30.9 ± 4.5

Table 11. Effects of chemical contaminants from the Hylebos Waterway on growth of juvenile chinook salmon. Average recoveries (includes saltwater recoveries and return to the hatcheries) of fall chinook salmon for major river systems of the Puget Sound basin during the period 1971 to 1991 derived from the Coded Wire Tag database (PFMSC 1993).

River System	% FW Returns	% SW Recovery	% Total Returns
Nooksack	0.24	3.83	4.07
Samish	0.15	1.44	1.60
Skagit	0.34	1.77	2.11
Skykomish	0.02	0.95	0.97
Issaquah	0.14	0.60	0.74
Green	0.16	0.50	0.66
Puyallup	0.05	0.54	0.59
Garrison	0.04	0.22	0.26
Deschutes	0.11	1.63	1.74
Minter Cr.	0.09	1.07	1.16
Coulter Cr.	0.09	0.15	0.24
Skokomish	0.12	0.38	0.50
Hood Canal	0.22	1.09	1.31
Elwha	0.12	0.59	0.76
Willapa Bay	0.23	0.80	1.03
Overall/Puget Sound	0.13	1.03	1.16
Overall/Washington State	**0.14**	**0.95**	**1.08**

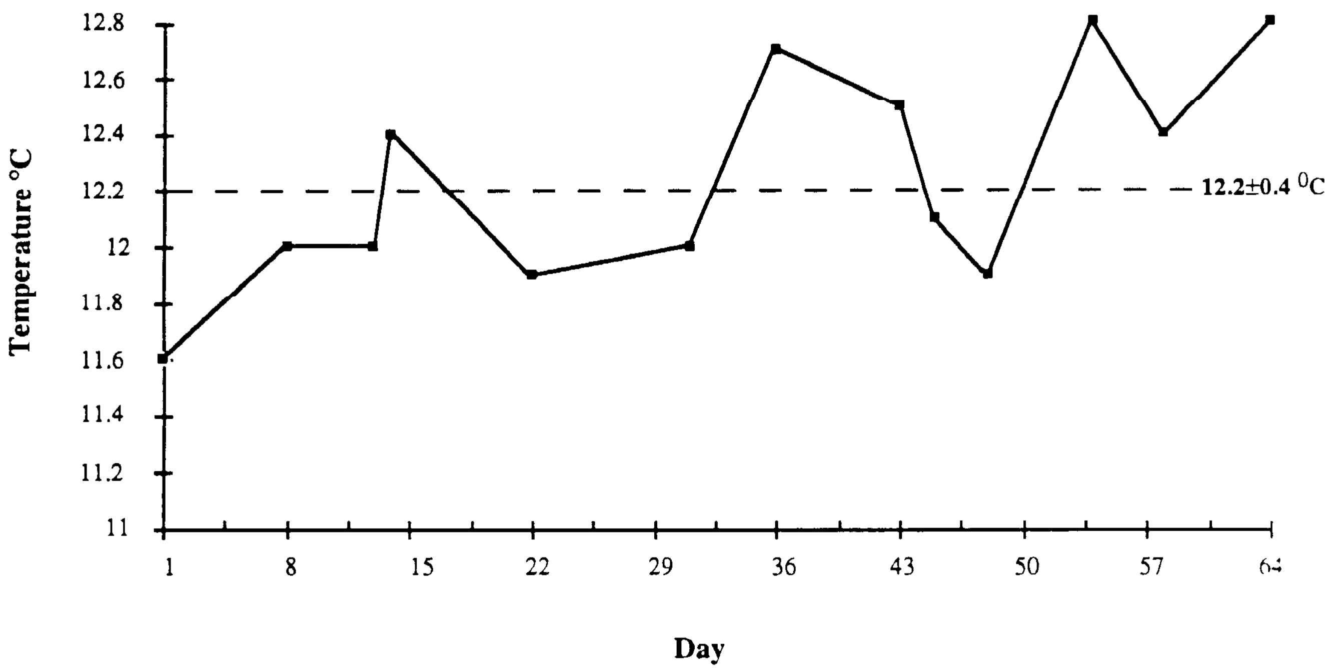

Figure 1. Effects of chemical contaminants from the Hylebos Waterway on growth of juvenile chinook salmon. Water temperature recorded during the experimental period of June 26 to August 25, 1997.

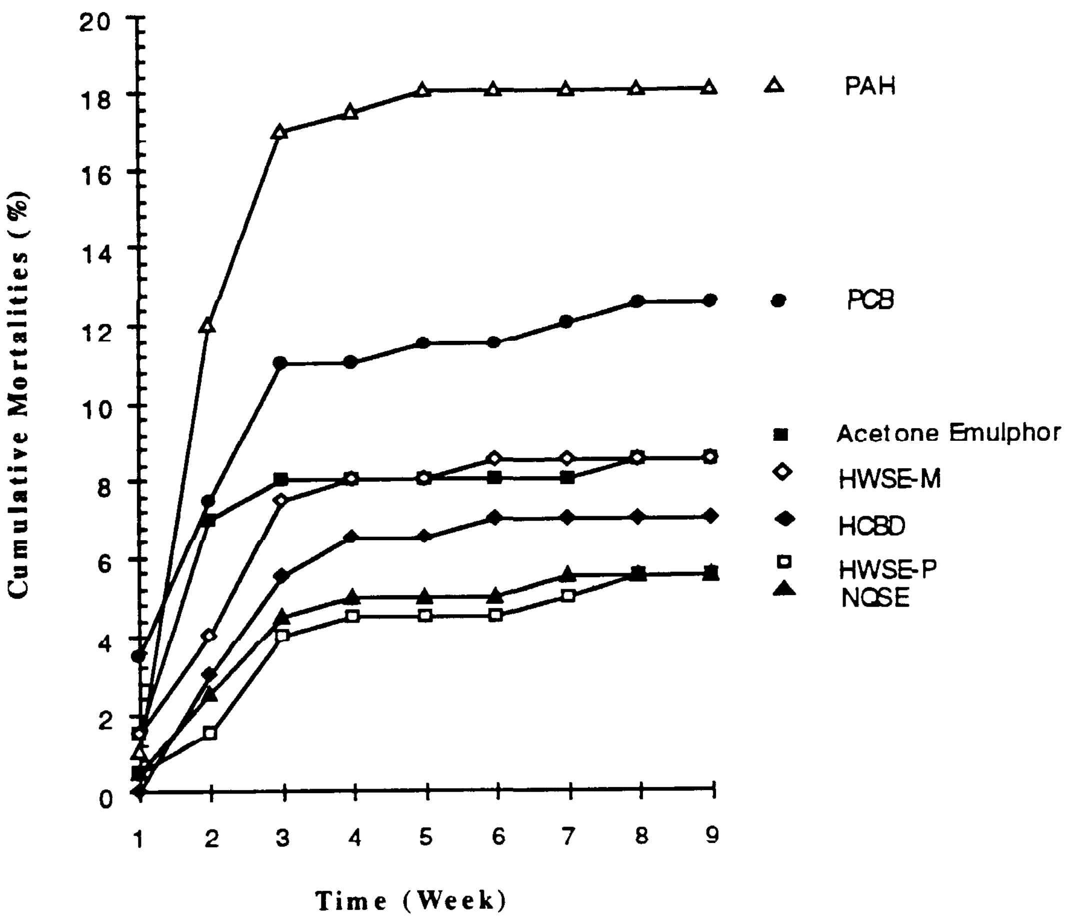

Figure 2. Effects of chemical contaminants from the Hylebos Waterway on growth of juvenile chinook salmon. Cumulative percent mortalities (weekly) of juvenile chinook salmon in Phase II experiment.

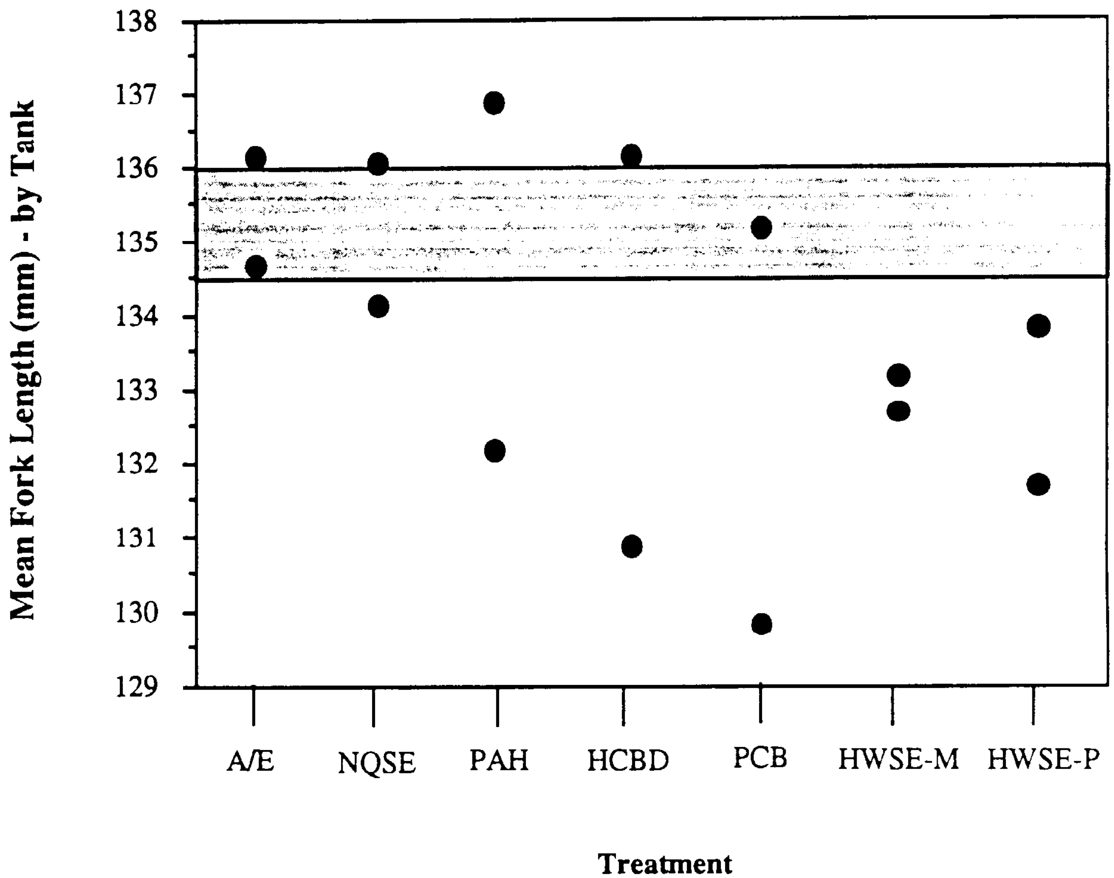

Figure 3. Effects of chemical contaminants from the Hylebos Waterway on growth of juvenile chinook salmon. Mean fork length (by tank) of juvenile chinook salmon in Phase II experiment. Shaded area represents the 95% confidence interval of mean fork length for juvenile salmon exposed to the solvent vehicle (acetone:Emulphor) or the reference sediment extract from the Nisqually River estuary.

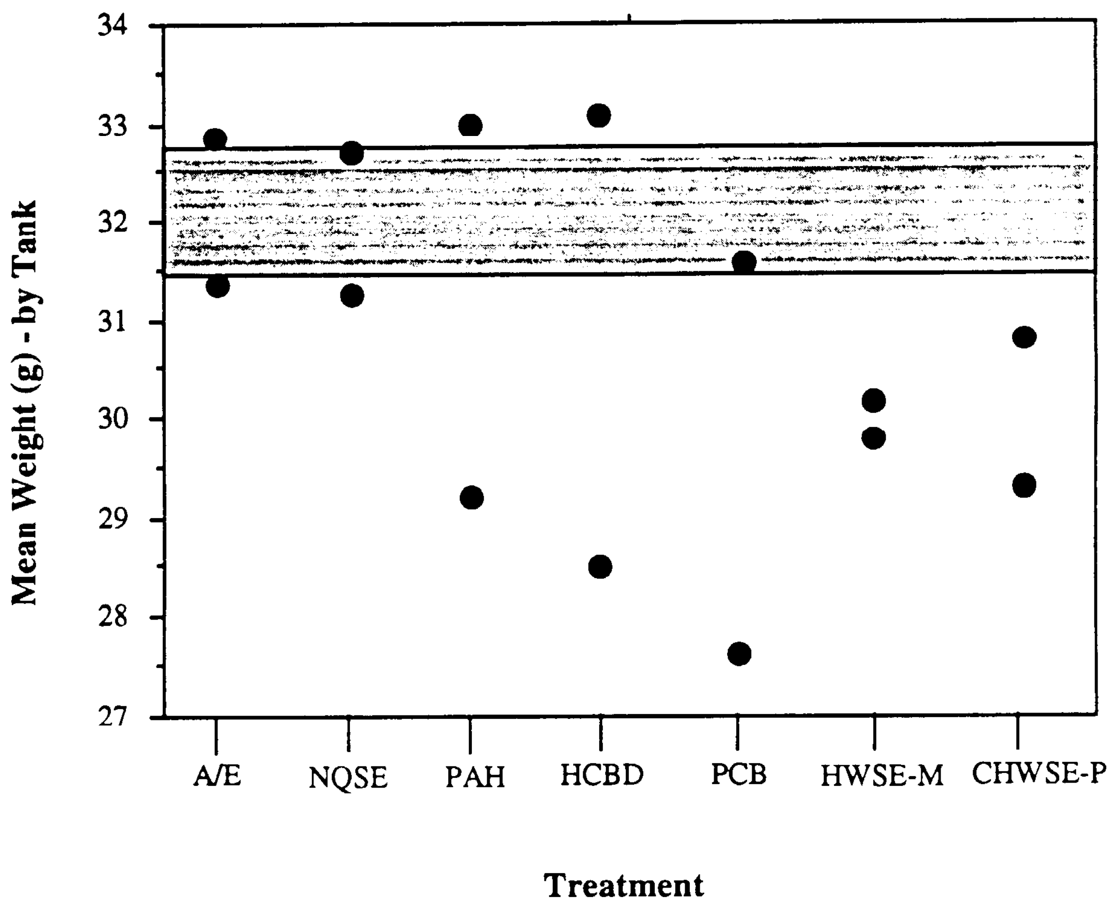

Figure 4. Effects of chemical contaminants from the Hylebos Waterway on growth of juvenile chinook salmon. Mean weight (by tank) of juvenile chinook salmon in Phase II experiment. Shaded area represents the 95% confidence interval of mean weight for juvenile salmon exposed to the solvent vehicle (acetone:Emulphor) or the reference sediment extract from the Nisqually River estuary.

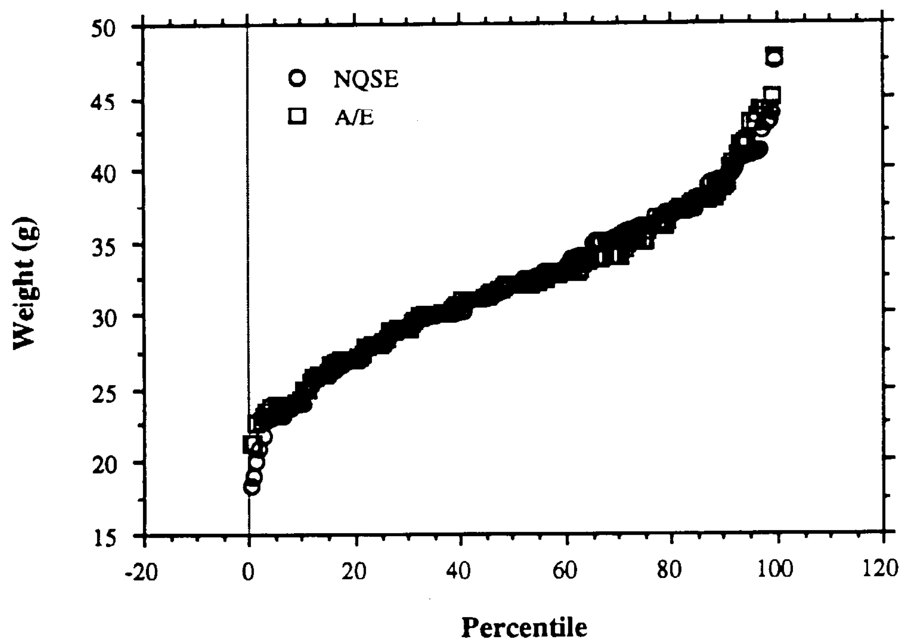

Figure 5. Effects of chemical contaminants from the Hylebos Waterway on growth of juvenile chinook salmon. Cumulative weight frequency distribution of juvenile chinook salmon after a 60 day exposure to Acetone/Emulphor (the solvent vehicle as control) or the reference Nisqually River estuary sediment extract.

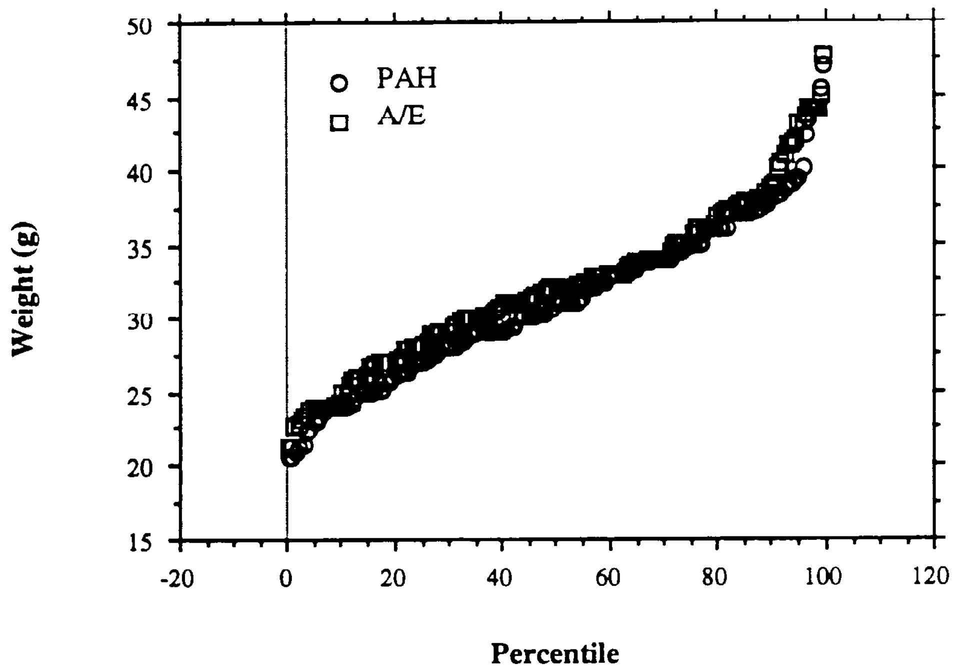

Figure 6. Effects of chemical contaminants from the Hylebos Waterway on growth of juvenile chinook salmon. Cumulative weight frequency distribution of juvenile chinook salmon after a 60 day exposure to Acetone/Emulphor (the solvent vehicle as control) or the model PAH mixture.

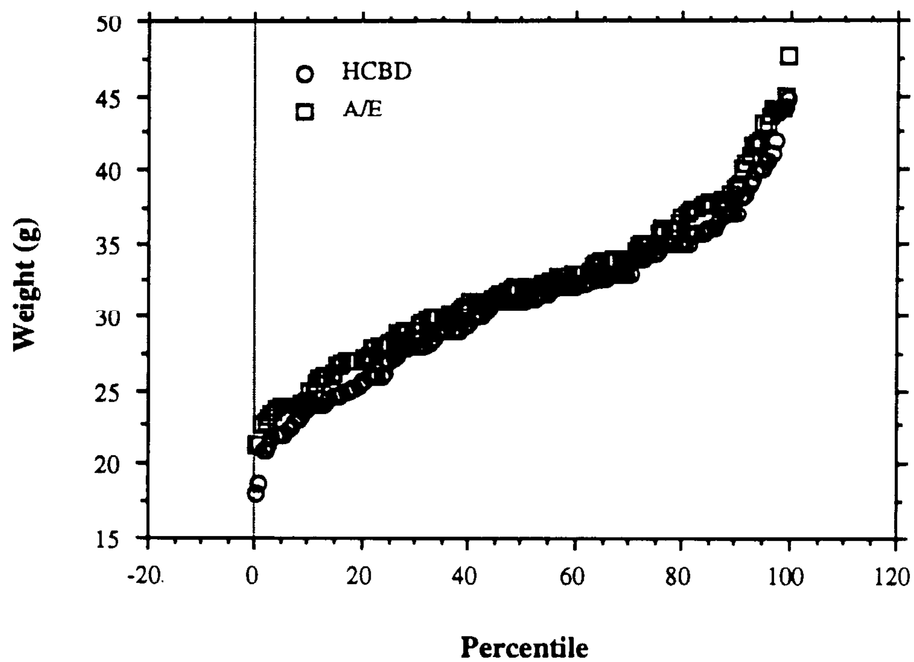

Figure 7. Effects of chemical contaminants from the Hylebos Waterway on growth of juvenile chinook salmon. Cumulative weight frequency distribution of juvenile chinook salmon after a 60 day exposure to Acetone/Emulphor (the solvent vehicle as control) or hexachlorobutadiene (HCBD).

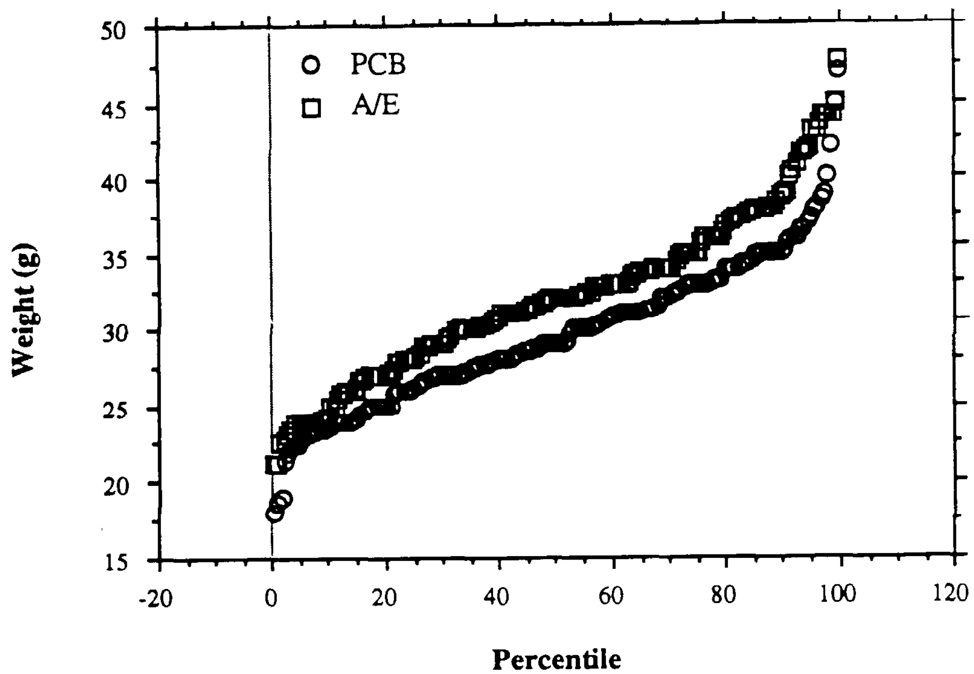

Figure 8. Effects of chemical contaminants from the Hylebos Waterway on growth of juvenile chinook salmon. Cumulative weight frequency distribution of juvenile chinook salmon after a 60 day exposure to Acetone/Emulphor (the solvent vehicle as control) or the PCB mixture (Aroclor 1254).

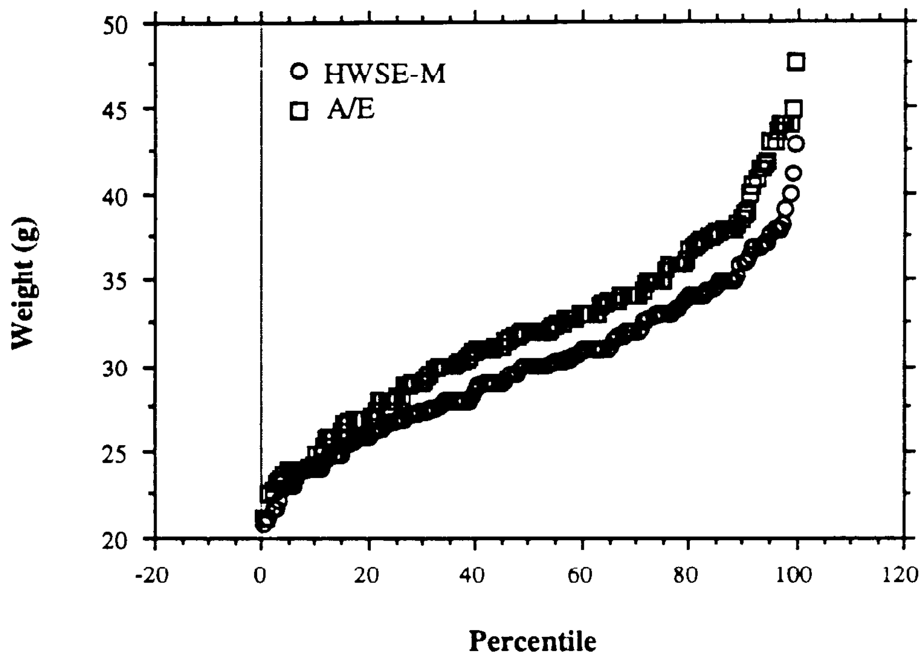

Figure 9. Effects of chemical contaminants from the Hylebos Waterway on growth of juvenile chinook salmon. Cumulative weight frequency distribution of juvenile chinook salmon after a 60 day exposure to Acetone/Emulphor (the solvent vehicle as control) or the sediment extract from the Hylebos Waterway (HWSE-M).

Hylebos Fish Injury Study - Round II, Part 2
Individual Data and Quality Assurance Results
CASE NARRATIVE

Effects of Chemical Contaminants from the Hylebos Waterway on Growth of Juvenile Chinook Salmon

Determination of Feeding Amounts

Food portions were measured by weight and determined for each tank. Portions were intended to be based on delivery of food at a rate of 4% of the total body weight of fish per day throughout the experiment. Initial feed amounts were based on starting weight of all fish in each tank; however, these amounts were not adjusted in the first 27 days of the experiment, thus feeding rates declined during this initial period. Starting on day 28, portions were adjusted weekly for accrued mortalities and an estimated growth rate of 1g/fish/week (in each tank). The growth rate was determined in an unrelated study in the previous year. Food amounts were adjusted to achieve the estimated feeding rate at the desired 4% of body weight per day.

Mortality

Mortalities for each tank were collected (usually daily and once on weekends) and entered into a database designed for the study. At the conclusion of the experiment, final numbers of fish measured plus recorded morts, did not equal starting numbers. Differences generally ranged from 1-10 fewer animals than expected in each tank. These differences can be attributed to fish which escaped either through netting covering the top of the tank or through the drain standpipe, although extensive effort was employed to minimize these losses. On some occasions, fish found on the floor could not be attributed to any one tank. These discoveries, therefore, were not recorded. Additionally, one tank (O) was found to contain 2 more fish than expected. These excess fish can not be factually accounted for, but may be attributed to an error in recording mortalities.

Growth Measurements

Generally, fish length was measured as fork length. However, at the end of the experiment, total lengths of 35 fish (each from tanks A, E, F, G, H, K, M, and O) were measured instead of fork lengths. The remaining length of fish in tanks A, E, F, G, H, K, M, and O were measured as fork length. When the error was realized, all subsequent measures of fish (from tanks C, I, J, L, N, and P) included both fork and total lengths. Fork length was then calculated for fish for which total length was only measured using the average ratio of fork length to total length for fish from tanks C, I, J, L, N, and P to calculate fork length of fish for which total length was only measured, using the following equation:

$$FL_{2i} = (FL_1/TL_1) \times TL_{2i}$$

where (FL_1/TL_1) is the average ratio of fork to total length for fish from tanks C, I, J, L, N, and P; TL_{2i} is the measured total length of individual fish from tanks A, E, F, G, H, K, M, and O , and FL_{2i} is the calculated fork length for $fish_i$ from these tanks. The resulted calculated fork lengths were then grouped with measured fork lengths of the remaining fish for analysis of treatment effects on length.

Effects of chemical contaminants from the Hylebos Waterway on growth of juvenile chinook salmon.

Data tables of length and weight of juvenile chinook salmon at the beginning of a 60 day exposure, Round II, Part 2.

Treatment: PCB **Tank#:** A

Date: 6/26/97

Fish#	Fork Length	Weight
1	98	9.5
2	96	8.9
3	98	9.2
4	97	8.7
5	98	9.7
6	91	7.1
7	88	5.9
8	92	7.4
9	94	7.8
10	98	9.2
11	90	7.4
12	96	8.9
13	95	8.4
14	98	9.4
15	97	8.6
16	93	8.3
17	98	9.1
18	98	9.3
19	89	6.7
20	87	6.3
21	98	9.0
22	96	8.5
23	97	9.5
24	98	9.9
25	97	8.8
26	95	8.0
27	95	8.6
28	96	8.5
29	95	8.6
30	90	6.5
31	94	7.6
32	89	6.9
33	98	9.2
34	91	7.2
35	94	7.6

Fish#	Fork Length	Weight
36	95	8.7
37	93	7.6
38	94	8.6
39	95	7.8
40	93	7.9
41	91	7.1
42	96	9.1
43	91	7.4
44	91	7.3
45	97	8.7
46	93	8.7
47	88	7.1
48	94	8.0
49	93	7.8
50	93	7.5
51	88	6.5
52	97	9.1
53	87	6.5
54	95	7.4
55	95	8.2
56	94	7.9
57	87	6.5
58	94	8.3
59	89	6.4
60	95	7.9
61	96	8.9
62	96	6.6
63	97	9.4
64	98	8.0
65	87	5.9
66	91	7.2
67	94	7.7
68	96	7.2
69	97	8.8
70	94	6.4

Fish#	Fork Length	Weight
71	92	7.1
72	95	8.0
73	96	7.8
74	93	8.5
75	92	7.8
76	95	8.3
77	97	8.2
78	87	6.2
79	95	8.0
80	93	7.9
81	96	8.8
82	95	7.2
83	98	9.6
84	97	8.6
85	96	9.1
86	92	7.0
87	94	8.6
88	93	8.3
89	96	8.7
90	93	7.8
91	94	7.9
92	92	6.9
93	89	6.3
94	95	8.0
95	91	7.2
96	91	7.3
97	91	6.3
98	92	7.4
99	89	6.7
100	98	9.1

Effects of chemical contaminants from the Hylebos Waterway on growth of juvenile chinook salmon.

Data tables of length and weight of juvenile chinook salmon at the beginning of a 60 day exposure, Round II, Part 2.

ment.

Treatment: ACE/EMUL **Tank#:** C

Date: 6/26/97

Fish#	Fork Length	Weight
1	96	9.1
2	104	7.5
3	96	10.1
4	96	6.8
5	97	9.4
6	99	8.2
7	92	8.1
8	102	8.1
9	92	7.7
10	92	8.2
11	97	7.8
12	95	8.4
13	97	9.0
14	99	9.7
15	97	9.2
16	90	7.2
17	94	8.0
18	91	7.6
19	93	8.7
20	92	8.0
21	91	7.2
22	97	9.3
23	97	9.5
24	94	7.4
25	95	8.2
26	98	9.1
27	87	6.3
28	95	8.2
29	92	8.1
30	95	8.5
31	88	6.7
32	94	7.6
33	90	7.4
34	93	7.9
35	94	8.3

Fish#	Fork Length	Weight
36	96	9.5
37	91	7.3
38	93	8.0
39	98	10.0
40	96	8.4
41	95	8.2
42	93	8.6
43	90	7.7
44	92	7.5
45	98	9.8
46	88	6.3
47	96	9.3
48	98	9.7
49	91	7.0
50	98	10.4
51	98	9.3
52	95	8.4
53	96	8.3
54	96	8.5
55	93	7.4
56	89	7.3
57	93	8.3
58	89	6.7
59	94	8.6
60	95	9.0
61	90	7.1
62	89	6.4
63	96	8.7
64	87	6.1
65	98	11.2
66	87	9.3
67	95	7.5
68	91	7.6
69	97	8.7
70	93	8.0

Fish#	Fork Length	Weight
71	94	7.8
72	95	8.8
73	97	9.4
74	96	9.9
75	98	9.4
76	92	7.9
77	93	7.8
78	95	8.2
79	98	9.5
80	96	5.8
81	97	9.8
82	96	8.6
83	91	7.9
84	93	7.4
85	96	8.5
86	95	8.3
87	95	8.7
88	95	8.1
89	96	8.3
90	95	8.0
91	94	8.7
92	91	7.5
93	95	8.5
94	92	7.8
95	98	9.7
96	95	8.1
97	90	7.0
98	96	8.0
99	96	9.0
100	93	7.7

Effects of chemical contaminants from the Hylebos Waterway on growth of juvenile chinook salmon.

Data tables of length and weight of juvenile chinook salmon at the beginning of a 60 day exposure, Round II, Part 2.

Treatment: PAHs **Tank#:** E

Date: 6/26/97

Fish#	Fork Length	Weight
1	98	10.0
2	93	6.9
3	97	8.9
4	97	9.1
5	98	9.6
6	96	8.9
7	96	8.0
8	97	7.7
9	96	9.0
10	98	8.9
11	96	9.0
12	97	8.6
13	92	7.3
14	96	8.6
15	98	9.6
16	92	8.0
17	97	8.2
18	90	6.4
19	88	6.6
20	90	7.4
21	93	7.4
22	94	8.7
23	96	8.5
24	96	8.0
25	93	7.6
26	96	8.3
27	96	8.8
28	93	8.1
29	88	6.8
30	92	8.3
31	88	6.5
32	91	7.2
33	87	6.4
34	90	7.1
35	96	9.4

Fish#	Fork Length	Weight
36	91	7.4
37	94	8.2
38	89	6.3
39	92	7.6
40	90	7.6
41	86	6.0
42	92	7.8
43	98	9.4
44	98	9.0
45	97	8.0
46	95	7.9
47	98	9.5
48	91	6.9
49	96	8.1
50	89	7.3
51	89	6.8
52	91	7.1
53	95	8.4
54	98	9.3
55	96	8.3
56	92	7.9
57	98	10.3
58	91	7.3
59	92	8.7
60	95	8.1
61	96	9.5
62	93	8.2
63	92	7.6
64	93	7.8
65	94	8.7
66	97	9.4
67	95	8.0
68	92	7.9
69	96	8.3
70	90	6.2

Fish#	Fork Length	Weight
71	97	8.8
72	90	7.2
73	90	6.3
74	92	7.4
75	92	7.5
76	90	7.5
77	95	8.6
78	95	8.2
79	94	8.2
80	93	7.4
81	93	7.8
82	93	8.2
83	89	6.6
84	94	7.9
85	90	7.1
86	95	7.8
87	98	9.1
88	94	7.7
89	89	6.8
90	87	6.6
91	93	6.8
92	88	6.2
93	95	8.4
94	93	8.0
95	97	9.0
96	95	8.1
97	98	8.7
98	97	9.5
99	95	7.9
100	95	8.4

Effects of chemical contaminants from the Hylebos Waterway on growth of juvenile chinook salmon.

Data tables of length and weight of juvenile chinook salmon at the beginning of a 60 day exposure, Round II, Part 2.

Treatment: PCB   **Tank#:** F

Date: 6/26/97

Fish#	Fork Length	Weight	Fish#	Fork Length	Weight	Fish#	Fork Length	Weight
1	91	7.7	36	96	8.3	71	94	7.1
2	93	7.6	37	94	8.4	72	95	8.6
3	89	7.0	38	94	7.7	73	96	8.3
4	95	8.3	39	98	8.9	74	90	6.7
5	98	8.8	40	87	6.1	75	89	6.5
6	97	9.2	41	96	9.2	76	91	6.7
7	92	7.7	42	98	9.5	77	92	7.3
8	94	8.6	43	95	8.6	78	98	8.8
9	97	8.8	44	94	7.1	79	98	10.3
10	92	7.9	45	96	9.0	80	92	8.2
11	95	8.2	46	94	7.9	81	92	7.3
12	94	8.5	47	92	7.8	82	93	8.0
13	91	7.8	48	98	8.9	83	94	8.6
14	90	7.1	49	89	6.7	84	93	8.2
15	93	8.3	50	99	9.6	85	95	8.5
16	97	9.1	51	98	8.1	86	96	8.7
17	95	8.5	52	97	8.4	87	93	7.9
18	93	7.3	53	96	9.2	88	93	7.3
19	91	7.2	54	98	8.9	89	93	8.2
20	91	8.3	55	93	7.1	90	97	9.0
21	98	9.5	56	91	7.2	91	90	7.2
22	95	8.8	57	96	8.7	92	92	7.8
23	89	6.6	58	96	8.7	93	92	8.1
24	91	6.0	59	95	7.7	94	95	8.7
25	98	9.5	60	89	7.0	95	95	8.2
26	95	8.2	61	95	8.5	96	94	7.9
27	93	7.7	62	92	7.8	97	90	6.9
28	97	10.1	63	95	8.5	98	97	9.0
29	91	7.6	64	94	8.0	99	89	6.7
30	92	7.0	65	91	6.7	100	94	6.9
31	88	6.7	66	89	6.9			
32	94	7.9	67	97	8.7			
33	95	8.6	68	91	7.4			
34	95	8.6	69	95	8.6			
35	95	9.4	70	96	8.7			