APPENDIX B

DATA QUALITY AND STATUS

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All analytical data were subjected to a quality assurance and quality control (QA/QC) review conducted by EcoChem, Incorporated located in Seattle. Validation reports are included in Appendix A. Field replicate results for chemical and conventional data are provided in the table at the end of this appendix. The following discussion summarizes the information in the validation reports.

B.1 GRAIN SIZE AND OTHER PARAMETER DATA

- Field triplicate analysis for grain size was performed on two sample groups. Precision was acceptable for one group. Results for the other group showed some variability in the mid-range between 15.6 and 125 microns, but was acceptable above and below this range.

- Results of sulfide analysis for 13 samples were assigned a "J" qualifier due to exceedence of holding time criteria, and 13 other sulfide results were assigned a "J" qualifier due to a high relative percent difference (RPD) value of laboratory triplicate analyses. Field replicates for sulfide had percent relative standard deviation (%RSD) out of control limits, possibly due to sample heterogeneity and holding time exceedences. Field replicate analyses for all other analytes were within control limits, and no qualifiers were necessary.

- For one set of field triplicate samples, the analysis of ammonia for Sample DAC-HY-19 was 11.4 mg/kg. The results in Samples DAC-HY-31 and DAC-HY-32 (two field replicates of DAC-HY-19) were 25.3 mg/kg and 28.9 mg/kg, respectively. Sample DAC-HY-19 was reanalyzed for ammonia, past holding time, and the result was 28.0 mg/kg.

Overall, precision and accuracy were acceptable. Qualifiers were assigned for sulfide results. The data, as qualified, were deemed acceptable by EcoChem.

B.2 CHEMICAL DATA

B.2.1 Total Acid Digestion Metals

Analytical data for 36 sediment samples and 2 field blank (filter) samples were reviewed using NOAA (1995) QC criteria. The laboratory followed the NOAA (1995) requirements for QC sample frequency of analysis, acceptance criteria, and corrective action processes. Data qualifiers were assigned as follows:

- Mercury results for all samples were qualified as estimated (UJ), due to holding time exceedences and presence in method blank samples, at the reporting limit.
- Cadmium results in nine samples were qualified as not detected (U) due to their presence in method blank samples.
- All arsenic results were qualified as estimated (J) due to standard reference material (SRM) recoveries that were less than the certified lower control limit.

For the analysis of antimony, accuracy could not be determined as all SRM certified values were less than the laboratory method detection limit (MDL), or the measured values were less than three times the MDL. Target MDLs were not met for antimony, arsenic, chromium, lead, mercury, nickel, and zinc. No qualification of data was necessary, and data usability was determined not to be affected.

B.2.2 Organotin Compounds

The laboratory followed the quality assurance plan requirements (NOAA 1995) for QC samples frequency of analysis, acceptance criteria, and corrective action processes. Precision of organotin compounds results, as measured by the RPD between duplicate sample pairs, was acceptable. Accuracy, as measured by the percent recovery of the SRMs, was acceptable for all organotin compounds species. NOAA (1995) QA/QC requirements were met, and all organotin compounds data as reported are acceptable for use.

B.2.3 Aromatic Hydrocarbons

General analytical methodology as outlined by NOAA (1995) and laboratory standard operating procedure (SOP) were followed. Qualified data and reasons for assigning qualifiers are as follows:

- The method blank for one laboratory batch contained low levels of naphthalene, fluoranthene, and pyrene. Only the naphthalene result for the filter blank, DAC-HY-05CCB, was qualified as not detected (U) at the reported concentration.

- Bottle blanks DAC-HY-11 and DAC-HY-22 and filter blank DAC-HY-05CCB contained low levels of naphthalene. The naphthalene result for DAC-HY-05CCB was qualified as described above (U). All sample results were significantly greater than 10 times the bottle blank concentrations, so no qualifiers were assigned on this basis.

- Percent RSDs calculated for laboratory replicates exceeded the criterion of 50 percent for 2-methylnaphthalene, fluorene, phenanthrene, anthracene, fluoranthene, and pyrene in Sample DAC-HY-03. Percent RSDs exceeded 50 percent for fluorene and anthracene in Sample DAC-HY-16. Qualification of data due to laboratory replicate precision outliers will apply only to the samples used for replicate analysis. Positive results for the compounds with high percent relative standard deviation (%RSD) values are estimated (J) in the replicate samples.

- Because of matrix spike/matrix spike duplicate (MS/MSD) performance, all positive results for phenanthrene and fluoranthene in one laboratory batch were qualified as estimated (J).

- Method detection limits listed by the laboratory for four analytes (2-methylnaphthalene, acenaphthalene, fluorene, and dibenz(a,h)anthracene) were greater than the MDL specified in Table 6.1 of the quality assurance plan (NOAA, 1995). With the exception of the 2-methylnaphthalene result for Sample DAC-HY-02A, all reported results for these compounds were significantly greater than the calculated MDL, so no action was required. For analytes that were not detected, the laboratory calculated a sample-specific reporting limit based upon the response of the lowest standard, sample weight, and percent moisture. However, the only analyses that do not have positive results for all compounds are the bottle and filter blanks and the reference samples. All field sample results are significantly greater than the reporting limit and calculated MDL, so sample results were judged not to be affected.

Accuracy, as demonstrated by the recovery values of most of the surrogate, matrix spike, and SRM compounds, was acceptable. Precision, as demonstrated by the RSD of the replicate concentrations of the SRM and by the RPD of the MS/MSD pairs, was acceptable. The data, as qualified, are acceptable for use.

B.2.4 Phthalates, Phenols, Chlorinated Benzenes, and Hexachlorobutadiene

The laboratory followed NOAA (1995) requirements for QC sample frequency of analysis, acceptance criteria, and corrective action processes. Accuracy was acceptable, as demonstrated by the percent recovery values of most of the surrogate and matrix spiking compounds. Precision, as demonstrated by the RPD of the MS/MSD pairs, was acceptable. Data were qualified because of calibration outliers, method blank contamination, a low surrogate compound percent recovery value, poor laboratory replicate precision, and MS/MSD percent recovery outliers. The data, as qualified, are acceptable for use. Qualifiers were assigned as follows:

- Positive results for di-n-octyl-phthalate in one laboratory batch were qualified as estimated (J) because the initial calibration correlation coefficient of 0.9824 was less than the specified (NOAA, 1995) value of 0.990.

- Seven of 16 target compounds were detected in all of method blanks. Action levels were established at 10 times the concentration detected in method blanks, and all associated sample results less than the action levels were qualified as not detected (U) at the reported concentrations.

- Phenol was detected in all method blanks at concentrations greater than 3 times the MDL. Phenol was also detected in all field samples, including bottle blank and filter blank samples. An action level for phenol was established using a criterion similar to that used to assess the SRM results. All associated phenol results less than the action level (18.3 ng/g) were qualified as not detected (U) at the reported concentrations.

- Surrogate spike recovery for dibenzyl phthalate was less than the lower control limit at 35 percent in Sample DAC-HY-24. Dibenzyl phthalate was used to calculate the concentrations of all of the phthalate target compounds. The phthalate target compounds in Sample DAC-HY-24 are qualified as estimated (J for positive results and UJ for reporting limits of nondetected compounds) due to low recovery.

- Results of laboratory replicate analysis for di-n-octyl phthalate (DAC-HY-16) and diethyl phthalate (DAC-HY-28) had percent RSD exceeding the specified (NOAA, 1995) goal of 50 percent. Positive results for the compounds with high percent RSD values are estimated (J) in the replicate samples.

- Because of MS/MSD performance, all positive results for bis(2 ethylhexyl)phthalate not previously qualified due to calibration outliers are estimated (J).

- The laboratory method for reporting detection limits does not agree with Table 6.1 of the quality assurance plan (NOAA, 1995). However, most reported positive results are greater than the reporting limit and calculated MDL, or are qualified as not detected (U) due to blank contamination. Therefor, no qualifier was assigned on the basis of the laboratory's method of reporting detection limits.

B.2.5 Pesticides, PCBs, and Hexachlorobenzene

The laboratory followed requirements (NOAA, 1995) for QC sample frequency of analysis, acceptance criteria, and corrective action processes. A summary of qualified data and reasons is as follows:

- Percent difference values for continuing calibration were less than the specified 10 percent, so no data were qualified on the basis of calibration parameter exceedences.

- Hexachlorobenzene was detected at a low concentration in the method blank extracted with one laboratory batch. Action levels were established at 10 times the concentration detected in the method blank. All associated hexachlorobenzene sample results were greater than the action levels, with the exception of Sample DAC-HY-02, which was qualified as not detected (U) at the reported concentration.

- Chlorobiphenyl congeners were detected in all of the method blanks at low levels, and 4 of the 17 congeners were detected in each method blank. All associated sample results less than the action level of 10 times the concentration detected in the method blank have been qualified as not detected (U) at the reported concentrations.

- Surrogate spike recoveries were within control limits specified by NOAA (1995), with the exception of Sample DAC-HY-34. All positive results in this sample are qualified as estimated (J), and the detection limits for non-detected compounds are qualified as estimated (UJ).

- Because of laboratory replicate analysis performance, positive results for alpha- and gamma-chlordane and chlorobiphenyl congener 153 (Sample DAC-HY-16) and for p,p'-DDT and chlorobiphenyl congener 195 (Sample DAC-HY-28) are estimated (J) in the replicate samples.

- No data were qualified on the basis of differences between the NOAA (1995) specified method for reporting MDLs and the laboratory's use of a method for calculating a sample-specific reporting limit rather than reporting MDLs.

- General analytical methodology as outlined in the quality assurance plan (NOAA, 1995) and laboratory SOP were followed. Accuracy, as demonstrated by the recovery values of most of the surrogate and matrix spike compounds, was acceptable. Precision, as demonstrated by the RPD of the MS/MSD pairs, was acceptable. Data qualifiers were issued due to method blank contamination, a low surrogate recovery, and poor laboratory replicate precision. The data, as qualified, are acceptable for use.

B.2.6 Volatile Organic Compounds

The laboratory followed QC analytical criteria specified by EVS (1994b). Two sample data groups were analyzed.

- All QC criteria were met for one data group, and no qualifiers were assigned.

- For the second data group, all samples were analyzed within the specified holding period of 14 days, with the exception of the rinsate blank DAC-HY-19VB (17 days) and the trip blank (22 days). No target compounds were detected in either sample. Due to the possible low bias, the detection limits were qualified as estimated (UJ) for all target compounds in the second data group.

For the volatile organic compound analysis, precision is acceptable, as demonstrated by the RPD values of the MS/MSD analyses. Accuracy is acceptable, as demonstrated by MS/MSD and laboratory control sample recovery values. All data, as qualified, are acceptable for use.

B.3 TOXICITY TEST DATA

Three standardized sediment toxicity tests were conducted: a 10-day amphipod test using *Rhepoxynius abronius*, a 20-day juvenile polychaete growth test using *Neanthes arenaceodentata*, and a 48-hour echinoderm larval test using *Dendraster excentricus*. Five

replicates were used for each sediment bioassay type. Sediment collected from West Beach, Whidbey Island was used as a negative control for all three bioassays.

Based on an independent data review, the data for amphipod, juvenile polychaete, and echinoderm larvae were deemed acceptable for use with the following qualifications for each test.

B.3.1 Amphipod Mortality Test

The starting temperature in the positive control in Setup #1 was measured at 17°C. The elevated temperature does not appear to have affected the results. Crabs and several small starfish were observed in several of the test sediment replicates. Several replicates were missing amphipods at the termination of the test. Comparisons between mean amphipod survival from these stations and mean control survival were not summarized with the data; therefore no determinations were made to evaluate if the presence of crabs or starfish had a significant effect on the bioassay results for these particular sediments.

B.3.2 Juvenile Polychaete Growth Test

Temperature measurements exceeded recommended test conditions (22°C) during the first two days of Setup #1, and in the positive control in Setups #1 and #2. The salinity of some samples fell outside of the lower and upper values (measurements ranged from 24 to 33 ppt) specified in the protocols, but do not appear to have affected the test results. Several of the dissolved oxygen (DO) measurements made during the test did not meet acceptance criteria. Percent survival does not appear to have been affected by the occasional drop in DO in replicate jars.

B.3.3 Echinoderm Larval Mortality and Abnormality Test

Test sediments were analyzed within the recommended holding times, except for samples DAC-HY-13T, DAC-HY-14T, DAC-HY-15T, DAC-HY-16T, DAC-HY-17T, DAC-HY-18T, DAC-HY-19T, and DAC-HY-25T, which were analyzed 1 or 2 days outside the recommended holding time of 14 days. Results for these samples are acceptable with proper holding conditions for sediments.

Inoculation density in Setup #1 was 15,400 embryos/L and in Setup #2 was 18,500 embryos/L. The SOP stated that recommended density is 20,000 to 40,000 embryos/L. Several samples showed survival recovery greater than controls, which resulted in negative mortality data. This may have been caused by initial inoculation and enumeration procedures.

Temperatures were measured at 16.5°C for the majority of the samples in Setup #1 (recommended range 15.0°C to 16°C), and temperature was measured at 17°C in the positive control for Setup #2. No data were available to determine if the elevated temperatures affected the bioassay results.

A few samples exceeded the upper salinity value (samples ranged from 29 to 32 ppt). The higher salinities should not have affected the test results.

One DO measurement was recorded below 60 percent saturation at 4.6 mg/L (sample range was 7.0 to 9.0 mg/L) in the water quality jar for station DAC-HY-23T. Since DO levels were measured at acceptable levels in each replicate at the termination of the test, this probably did not significantly affect the test results.

Water quality measurements recorded for each sample replicate upon termination of each bioassay generally indicated that acceptable water quality conditions existed for all tests.

B.4 BENTHIC ORGANISM IDENTIFICATION AND ABUNDANCE DATA

Benthic infauna samples were collected using a 0.06-m^2 van Veen grab sampler and sieved through a 1.0-mm screen. Materials retained on the screen were transferred to sample containers and fixed with a 10 percent solution of buffered formalin. In the laboratory samples were preserved in a 70 percent ethanol solution for sorting. Species were then identified and enumerated to the lowest practical taxonomic level.

All benthic data were deemed acceptable; no significant problems were encountered during the taxonomic review. The samples submitted for independent review (identification and enumeration) met the variability criterion of 5 percent or less.

Measurement of Conventionals in Surface Sediments of the Hylebos Waterway for Field Replicates (mg/kg DW)

		Clay, percent		Gravel, percent		Sand, percent		Silt, percent		Total solids		Total volatile solids		Ammonia-nitrogen		Sulfides		Total organic carbon	
Station	Sample	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.
DAC-HY-06	06C	18.0		1.00		45.0		36.0		57.2		24400		15.6		719		1.93	
DAC-HY-06	33C	21.0		3.00		43.0		33.0		58.1		24000		13.0		310		1.83	
DAC-HY-06	34C	17.0		1.00		46.0		36.0		52.2		26300		16.5		224		1.98	
DAC-HY-19	19C	27.0		0.00		24.0		49.0		45.9		40100		11.4		941	J	3.85	
DAC-HY-19	31C	28.0		0.00		21.0		51.0		44.5		38600		25.3		996	J	3.54	
DAC-HY-19	32C	26.0		0.00		25.0		49.0		44.2		37000		28.9		849	J	3.08	

Concentrations of Metals in Surface Sediments of Hylebos Waterway for Field Replicates using Strong Acid (mg/kg)

		Antimony		Arsenic		Cadmium		Chromium		Copper		Lead		Mercury		Nickel		Silver		Zinc	
Station	Sample	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.
DAC-HY-06	06C	0.995	U	20.7		0.331		35.9		80.2		68.6		0.365	UJ	22.7		0.356		130	
DAC-HY-06	33C	0.995	U	17.0		0.310		24.9		85.9		74.6		2.59	UJ	22.9		0.376		127	
DAC-HY-06	34C	0.995	U	22.1		0.523		30.8		77.0		94.2		2.41	UJ	25.6		0.356		178	
DAC-HY-19	19C	1.45		42.0		0.676		32.6		120		74.1		0.595	UJ	28.4		0.438		169	
DAC-HY-19	31C	1.55		37.7		0.679		37.7		132		79.5		0.709	UJ	30.3		0.474		205	
DAC-HY-19	32C	5.37		36.3		0.624	U	36.3		131		101		0.628	UJ	29.5		0.450		340	

Concentration of Metals in Surface Sediments of the Hylebos Waterway for Field Replicates using Total Acid Digestion (mg/kg DW)

		Antimony		Arsenic		Cadmium		Chromium		Copper		Lead		Mercury		Nickel		Silver		Zinc	
Station	Sample	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.
DAC-HY-06	06C	3.05		15.0		0.405	U	31.0		79.1		73.9		0.281	UJ	35.0		0.264		142	
DAC-HY-06	33C	20.1		28.2		0.378		28.5		90.7		66.1		1.77		32.9		0.312		163	
DAC-HY-06	34C	6.95		14.8		0.405		43.3		81.7		85.9		1.66	UJ	38.7		0.222		160	
DAC-HY-19	19C	14.1		40.1		0.529		33.6		135		95.5		2.70	UJ	36.7		0.340		217	
DAC-HY-19	31C	10.3		18.3		0.655		33.9		133		116		0.450	UJ	35.1		0.289		203	
DAC-HY-19	32C	19.7		95.1		0.580		33.6		127		124		0.401	UJ	35.9		0.304		290	

Concentration of Organotin Compounds in Surface Sediments of the Hylebos Waterway for Field Replicates (ug/kg DW)

Station	Sample	Monobutyltin		Dibutyltin		Tributyltin		Tetrabutyltin	
		Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.
DAC-HY-06	06C	7.31	U	7.31	U	35.1		7.31	U
DAC-HY-06	33C	8.47	U	19.5		78.3		8.47	U
DAC-HY-06	34C	7.70	U	22.7		44.2		7.70	U
DAC-HY-19	19C	9.78	U	55.7		218		9.77	U
DAC-HY-19	31C	7.03	U	30.1		147		7.03	U
DAC-HY-19	32C	9.40	U	49.0		252		9.40	U

Concentrations of Semivolatile Organic Compounds in Surface Sediments of the Hylebos Waterway for Field Replicates (ug/kg DW)

		2-Methylnaphthalene		Acenaphthene		Acenaphthylene		Anthracene		Fluorene		Total low molecular weight PAHs	
Station	Sample	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.
DAC-HY-06	06C	130		110		19.0		270		150		1470	
DAC-HY-06	33C	95.0		74.0		25.0		260		110		1190	
DAC-HY-06	34C	260		340		34.0		720		440		3760	
DAC-HY-19	19C	83.0		140		26.0		450		150		2030	
DAC-HY-19	31C	65.0		40.0		21.0		240		67.0		968	
DAC-HY-19	32C	78.0		60.0		25.0		350		90.0		1420	

Concentrations of Semivolatile Organic Compounds in Surface Sediments of the Hylebos Waterway for Field Replicates (ug/kg DW) (Continued)

Station	Sample	Naphthalene		Phenanthrene		Dibenz(a,h)anthracene		Benz(a)anthracene		Benzo(a)pyrene		Benzo(g,h,i)perylene		Chrysene	
		Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.
DAC-HY-06	06C	260		660		61.0		420		410		250		610	
DAC-HY-06	33C	230		490		70.0		420		430		260		630	
DAC-HY-06	34C	730		1500		96.0		930		600		360		1200	
DAC-HY-19	19C	160		1100		200		850		1100		940		2200	
DAC-HY-19	31C	140		460		180		750		960		880		2000	
DAC-HY-19	32C	330		570		220		970		1200		1100		2700	

Concentrations of Semivolatile Organic Compounds in Surface Sediments of the Hylebos Waterway for Field Replicates (ug/kg DW) (Continued)

		Fluoranthene		Total high molecular weight PAHs		Indeno(1,2,3-c,d)pyrene		Pyrene		Total benzofluoranthenes		2-Methylphenol	
Station	Sample	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.
DAC-HY-06	06C	970		5200		250		1300		930		6.30	U
DAC-HY-06	33C	1100		5540		280		1400		950		4.30	U
DAC-HY-06	34C	2700		10300		360		2700		1400		7.00	U
DAC-HY-19	19C	2200		15500		800		3800		3400		7.50	
DAC-HY-19	31C	1700		13300		710		2700		3400		8.00	U
DAC-HY-19	32C	4500		20800		900		5100		4100		6.70	U

Concentrations of Semivolatile Organic Compounds in Surface Sediments of the Hylebos Waterway for Field Replicates (ug/kg DW) (Continued)

		2,4-Dimethylphenol		4-Methylphenol		Pentachlorophenol		Phenol		1,2-Dichlorobenzene		1,2,4-Trichlorobenzene		1,3-Dichlorobenzene	
Station	Sample	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.
DAC-HY-06	06C	6.10		20.0		35.0	J	40.0		10.0		97.0		11.0	
DAC-HY-06	33C	8.20		25.0		33.0		33.0		5.20		46.0		5.60	
DAC-HY-06	34C	15.0		37.0		29.0		37.0		12.0		110		19.0	
DAC-HY-19	19C	9.70		42.0		72.0	J	44.0		6.70		40.0		7.00	
DAC-HY-19	31C	9.50		42.0		56.0		47.0		7.20		39.0		6.30	
DAC-HY-19	32C	8.30		43.0		83.0		46.0		6.40		42.0		7.40	

Concentrations of Semivolatile Organic Compounds in Surface Sediments of the Hylebos Waterway for Field Replicates (ug/kg DW) (Continued)

		1,4-Dichlorcbenzene		Hexachlorobutadiene		Di-n-cctyl phthalate		Bis(2-ethylhexyl)phthalate		Butylbenzyl phthalate		Diethyl phthalate		Dimethyl phthalate	
Station	Sample	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.
DAC-HY-06	06C	81.0		150		10.0		140	J	9.70	J	2.50	UJ	4.80	J
DAC-HY-06	33C	51.0		71.0		9.40		210	J	8.20	U	2.70	UJ	4.70	
DAC-HY-06	34C	170		150		3.90		160	J	8.80	U	2.10	UJ	3.40	UJ
DAC-HY-19	19C	22.0		27.0		7.10		500	J	53.0	J	3.00	UJ	30.0	J
DAC-HY-19	31C	25.0		33.0		6.20		580	J	120		3.90	UJ	39.0	J
DAC-HY-19	32C	21.0		53.0		15.0		520	J	59.0		3.20	UJ	25.0	

Concentrations of Semivolatile Organic Compounds in Surface Sediments of the Hylebos Waterway for Field Replicates (ug/kg DW) (Continued)

		Di-n-butyl phthalate		Gamma-HCH (Lindane)		Hexachlorobenzene		Aldrin		Alpha-chlordane		Gamma-chlordane		Chlordane	
Station	Sample	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.
DAC-HY-06	06C	6.20	UJ	2.00		63.0		0.062	U	3.00		4.20		7.20	
DAC-HY-06	33C	8.20	UJ	2.90		44.0		0.042	U	2.50		4.50		7.00	
DAC-HY-06	34C	7.50	UJ	5.10		99.0		3.60		4.20		0.058	U	4.20	
DAC-HY-19	19C	15.0	UJ	1.40		21.0		0.061	U	2.30		0.060	U	2.30	
DAC-HY-19	31C	27.0	UJ	1.20		22.0		0.068	U	1.30		0.066	U	1.30	
DAC-HY-19	32C	23.0	UJ	1.90		28.0		0.058	U	3.90		0.063	U	3.90	

Concentrations of Semivolatile Organic Compounds in Surface Sediments of the Hylebos Waterway for Field Replicates (ug/kg DW) (Continued)

		Dieldrin		Heptachlor		Chlorobiphenyl 10/209		Chlorobiphenyl 3/18		Chlorobiphenyl 3/28		Chlorobiphenyl 4/44		Chlorobiphenyl 4/52	
Station	Sample	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.
DAC-HY-06	06C	1.40		1.90		57.0		5.80		6.20		6.40		7.00	
DAC-HY-06	33C	1.70		3.10		38.0		6.70		5.70		6.20	U	6.20	
DAC-HY-06	34C	2.70		6.90		99.0		0.200	U	7.40		16.0		13.0	
DAC-HY-19	19C	0.062	U	0.900		19.0		14.0		9.50		12.0		20.0	
DAC-HY-19	31C	1.40		1.70		20.0		7.40		6.20		11.0		25.0	
DAC-HY-19	32C	0.640		0.600		18.0		14.0		6.00		7.20	U	14.0	

Concentrations of Semivolatile Organic Compounds in Surface Sediments of the Hylebos Waterway for Field Replicates (ug/kg DW) (Continued)

		Chlorobiphenyl 4/66		Chlorobiphenyl 5/101		Chlorobiphenyl 5/105		Chlorobiphenyl 5/118		Chlorobiphenyl 6/128		Chlorobiphenyl 6/138		Chorobiphenyl 6/153	
Station	Sample	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.
DAC-HY-06	06C	12.0		6.20		7.40		41.0		0.048	U	11.0		8.70	
DAC-HY-06	33C	5.00		6.80		6.70		38.0		2.40		18.0		9.90	
DAC-HY-06	34C	11.0		9.40		0.054	U	19.0		3.10		13.0		9.10	
DAC-HY-19	19C	6.00		40.0		16.0		40.0		11.0		48.0		48.0	
DAC-HY-19	31C	0.090	U	40.0		0.062	U	49.0		9.60		44.0		48.0	
DAC-HY-19	32C	5.00		33.0		14.0		51.0		8.50		38.0		46.0	

Concentrations of Semivolatile Organic Compounds in Surface Sediments of the Hylebos Waterway for Field Replicates (ug/kg DW) (Continued)

		Chlorobiphenyl 7/170		Chlorobiphenyl 7/180		Chlorobiphenyl 7/187		Chlorobiphenyl 8/195		Chlorobiphenyl 9/206		PCBs, total		p,p-DDD	
Station	Sample	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.
DAC-HY-06	06C	0.940	U	31.0		5.80		3.40		44.0		510		7.40	
DAC-HY-06	33C	1.10		25.0		5.40		2.80		27.0		420		6.20	
DAC-HY-06	34C	2.00		16.0		7.90		3.90		60.0		580		8.30	
DAC-HY-19	19C	3.20		29.0		7.40		1.70		12.0		670		14.0	
DAC-HY-19	31C	2.20		23.0		7.50		1.70		11.0		610		12.0	
DAC-HY-19	32C	2.90		23.0		17.0		4.30		21.0		650		15.0	

Concentrations of Semivolatile Organic Compounds in Surface Sediments of the Hylebos Waterway for Field Replicates (ug/kg DW) (Continued)

		p,p-DDE		p,p-DDT	
Station	Sample	Conc.	Qual.	Conc.	Qual.
DAC-HY-06	06C	0.840		2.70	
DAC-HY-06	33C	0.640		3.10	
DAC-HY-06	34C	0.790		0.100	U
DAC-HY-19	19C	6.30		5.40	
DAC-HY-19	31C	3.90		3.00	
DAC-HY-19	32C	3.90		7.60	

Concentrations of Volatile Organic Compounds in Surface Sediments of the Hylebos Waterway for Field Replicates (ug/kg DW)

		Trichloroethene		Tetrachloroethene		Ethylbenzene		Xylenes		1,2-Dichlorobenzene		1,2,4-Trichlorobenzene		1,3-Dichlorobenzene		1,4-Dichlorobenzene	
Station	Sample	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.
DAC-HY-06	06C	1.40	U	1.40	U	1.40	U	2.80	U	1.40	U	7.00	U	1.40	U	1.40	U
DAC-HY-06	33C	3.20		1.70	U	1.70	U	3.40	U	1.70	U	8.40	U	1.70	U	1.70	U
DAC-HY-06	34C	1.50	U	1.50	U	1.50	U	3.00	U	1.50	U	7.50	U	1.50	U	11.0	
DAC-HY-19	19C	1.00	U	1.00	U	1.00	U	2.00	U	1.00	U	5.00	U	1.00	U	1.00	U
DAC-HY-19	31C	2.00	U	2.00	U	2.00	U	4.00	U	2.00	U	10.0	U	2.00	U	2.00	U
DAC-HY-19	32C	1.90	U	1.90	U	1.90	U	3.80	U	1.90	U	9.60	U	1.90	U	1.90	U

Concentrations of Semi-Volatile Organic Compounds in Surface Sediments of Hylebos Waterway for Field Replicates (Organic Carbon Normalized)

		2-Methylnaphthalene		Acenaphthene		Acenaphthylene		Anthracene		Fluorene		Total low molecular weight PAHs		Naphthalene		Phenanthrene	
Station	Sample	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.
DAC-HY-06	06C	6740		5700		984		14000		7770		76100		13500		34200	
DAC-HY-06	33C	5190		4040		1370		14200		6010		65000		12600		26800	
DAC-HY-06	34C	13100		17200		1720		36400		22200		190000		36900		75800	
DAC-HY-19	19C	2160		3640		675		11700		3900		52600		4160		28600	
DAC-HY-19	31C	1840		1130		593		6780		1890		27300		3950		13000	
DAC-HY-19	32C	2530		1950		812		11400		2920		46300		10700		18500	

Concentrations of Semi-Volatile Organic Compounds in Surface Sediments of Hylebos Waterway for Field Replicates (Organic Carbon Normalized) (Continued)

		Dibenz(a,h)anthracene		Benz(a)anthracene		Benzo(a)pyrene		Benzo(g,h,i)perylene		Chrysene		Fluoranthene		Total high molecular weight PAHs	
Station	Sample	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.
DAC-HY-06	06C	3160		21800		21200		13000		31600		50300		269000	
DAC-HY-06	33C	3830		23000		23500		14200		34400		60100		303000	
DAC-HY-06	34C	4850		47000		30300		18200		60600		136000		523000	
DAC-HY-19	19C	5190		22100		28600		24400		57100		57100		402000	
DAC-HY-19	31C	5080		21200		27100		24900		56500		48000		375000	
DAC-HY-19	32C	7140		31500		39000		35700		87700		146000		675000	

Concentrations of Semi-Volatile Organic Compounds in Surface Sediments of Hylebos Waterway for Field Replicates (Organic Carbon Normalized) (Continued)

		Indeno(1,2,3-c,d)pyrene		Pyrene		Total benzofluoranthenes		1,2-Dichlorobenzene		1,2,4-Trichlorobenzene		1,3-Dichlorobenzene		1,4-Dichlorobenzene	
Station	Sample	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.
DAC-HY-06	06C	13000		67400		48200		518		5030		570		4200	
DAC-HY-06	33C	15300		76500		51900		284		2510		306		2790	
DAC-HY-06	34C	18200		136000		70700		606		5560		960		8590	
DAC-HY-19	19C	20800		98700		88300		174		1040		182		571	
DAC-HY-19	31C	20100		76300		96000		203		1100		178		706	
DAC-HY-19	32C	29200		166000		133000		208		1360		240		682	

Concentrations of Semi-Volatile Organic Compounds in Surface Sediments of Hylebos Waterway for Field Replicates (Organic Carbon Normalized) (Continued)

		Hexachlorobutadiene		Di-n-octyl phthalate		Bis(2-ethylhexyl)phthalate		Butylbenzyl phthalate		Diethyl phthalate		Dimethyl phthalate		Di-n-butyl phthalate		Hexachlorobenzene	
Station	Sample	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.
DAC-HY-06	06C	7770		518		7250	J	503	J	130	UJ	249	J	321	UJ	3260	
DAC-HY-06	33C	3880		514		11500	J	448	U	148	UJ	257		448	UJ	2400	
DAC-HY-06	34C	7580		197		8080	J	444	U	106	UJ	172	UJ	379	UJ	5000	
DAC-HY-19	19C	701		184		13000	J	1380	J	77.9	UJ	779	J	390	UJ	545	
DAC-HY-19	31C	932		175		16400	J	3390		110	UJ	1100	J	763	UJ	621	
DAC-HY-19	32C	1720		487		16900	J	1920		104	UJ	812		747	UJ	909	

Concentrations of Semi-Volatile Organic Compounds in Surface Sediments of Hylebos Waterway for Field Replicates (Organic Carbon Normalized) (Continued)

Station	Sample	Chlorobiphenyl 10/209 Conc.	Qual.	Chlorobiphenyl 3/18 Conc.	Qual.	Chlorobiphenyl 3/28 Conc.	Qual.	Chlorobiphenyl 4/44 Conc.	Qual.	Chlorobiphenyl 4/52 Conc.	Qual.	Chlorobiphenyl 4/66 Conc.	Qual.	Chlorobiphenyl 5/101 Conc.	Qual.
DAC-HY-06	06C	2950		301		321		332		363		622		321	
DAC-HY-06	33C	2080		366		311		339	U	339		273		372	
DAC-HY-06	34C	5000		10.1	U	374		808		657		556		475	
DAC-HY-19	19C	494		364		247		312		519		156		1040	
DAC-HY-19	31C	565		209		175		311		706		2.54	U	1130	
DAC-HY-19	32C	584		455		195		234	U	455		162		1070	

Concentrations of Semi-Volatile Organic Compounds in Surface Sediments of Hylebos Waterway for Field Replicates (Organic Carbon Normalized) (Continued)

		Chlorobiphenyl 5/105		Chlorobiphenyl 5/118		Chlorobiphenyl 6/128		Chlorobiphenyl 6/138		Chlorobiphenyl 6/153		Chlorobiphenyl 7/170		Chlorobiphenyl 7/180	
Station	Sample	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.
DAC-HY-06	06C	383		2120		2.49	U	570		451		48.7	U	1610	
DAC-HY-06	33C	366		2080		131		984		541		60.1		1370	
DAC-HY-06	34C	2.73	U	960		157		657		460		101		808	
DAC-HY-19	19C	416		1040		286		1250		1250		83.1		753	
DAC-HY-19	31C	1.75	U	1380		271		1240		1360		62.2		650	
DAC-HY-19	32C	455		1660		276		1230		1490		94.2		747	

Concentrations of Semi-Volatile Organic Compounds in Surface Sediments of Hylebos Waterway for Field Replicates (Organic Carbon Normalized) (Continued)

		Chlorobiphenyl 7/187		Chlorobiphenyl 8/195		Chlorobiphenyl 9/206		PCBs, total	
Station	Sample	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.
DAC-HY-06	06C	301		176		2280		26400	
DAC-HY-06	33C	295		153		1480		23000	
DAC-HY-06	34C	399		197		3030		29300	
DAC-HY-19	19C	192		44.2		312		17400	
DAC-HY-19	31C	212		48		311		17200	
DAC-HY-19	32C	552		140		582		21100	

Concentrations of Volatile Organic Compounds in Surface Sediments of Hylebos Waterway for Field Replicates (Organic Carbon Normalized)

		Trichloroethene		Tetrachloroethene		Ethylbenzene		Xyleres		1,2-Dichlorobenzene		1,2,4-Trichlorobenzene		1,3-Dichlorobenzene		1,4-Dichlorobenzene	
Station	Sample	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.
DAC-HY-06	06C	72.5	U	72.5	U	72.5	U	145	U	72.5	U	363	U	72.5	U	72.5	U
DAC-HY-06	33C	175		92.9	U	92.9	U	186	U	92.9	U	459	U	92.9	U	92.9	U
DAC-HY-06	34C	75.8	U	75.8	U	75.8	U	152	U	75.8	U	379	U	75.8	U	556	
DAC-HY-19	19C	26.0	U	26.0	U	26.0	U	52.0	U	26.0	U	130	U	26.0	U	26.0	U
DAC-HY-19	31C	56.5	U	56.5	U	56.5	U	113	U	56.5	U	282	U	56.5	U	56.5	U
DAC-HY-19	32C	61.7	U	61.7	U	61.7	U	123	U	61.7	U	312	U	61.7	U	61.7	U

APPENDIX C

ANALYTICAL RESULTS
FOR SURFACE SEDIMENT SAMPLES

Measurement of Conventionals in Surface Sediments of the Hylebos Waterway and Reference Stations (mg/kg DW)

Station	Sample	Clay, percent		Gravel, percent		Sand, percent		Silt, percent		Total solids		Total volatile solids		Ammonia-nitrogen		Sulfides		Total organic carbon	
		Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.
DAC-HY-01	01C	16.0		4.00		42.0		38.0		63.3		21900		1.80		30.0		1.50	
DAC-HY-02	02C	14.0		19.0		37.0		30.0		63.8		26400		2.66		337		1.80	
DAC-HY-03	03C	25.0		0.00		32.0		43.0		55.4		26200		9.03		740		1.92	
DAC-HY-04	04C	23.0		1.00		36.0		40.0		60.0		26000		22.0		179		1.75	
DAC-HY-05	05C	22.0		0.00		39.0		39.0		58.0		28400		26.5		145		1.97	
DAC-HY-06	06C	18.0		1.00		45.0		36.0		57.2		24400		15.6		719		1.93	
DAC-HY-07	07C	19.0		1.00		48.0		32.0		59.7		23200		19.0		151		1.75	
DAC-HY-08	08C	31.0		0.00		13.0		56.0		49.5		29600		9.84		1450		2.88	
DAC-HY-09	09C	23.0		1.00		31.0		45.0		52.0		26900		22.0		270		2.02	
DAC-HY-10	10C	26.0		1.00		24.0		49.0		48.4		28600		26.5		307		2.04	
DAC-HY-11	11C	22.0		1.00		31.0		46.0		53.9		28500		21.5		153	J	2.09	
DAC-HY-12	12C	22.0		0.00		34.0		44.0		53.6		31100		18.6		9.44	J	2.50	
DAC-HY-13	13C	11.0		28.0		38.0		23.0		65.1		26000		11.7		108	J	1.89	
DAC-HY-14	14C	16.0		2.00		55.0		27.0		61.2		24300		11.1		46.8	J	1.47	
DAC-HY-15	15C	29.0		0.00		19.0		52.0		45.2		34000		21.0		79.0	J	2.55	
DAC-HY-16	16C	30.0		0.00		12.0		58.0		41.2		33100		20.0		813	J	3.12	
DAC-HY-17	17C	16.0		1.00		36.0		47.0		62.1		26300		8.81		210	J	2.28	
DAC-HY-18	18C	28.0		0.00		21.0		51.0		43.7		37500		16.7		916	J	3.37	
DAC-HY-19	19C	27.0		0.00		24.0		49.0		45.9		40100		28.0		941	J	3.85	
DAC-HY-20	20C	36.0		0.00		7.00		57.0		41.8		38800		25.7		2350		4.04	
DAC-HY-21	21C	33.0		0.00		10.0		57.0		40.6		39000		25.9		2820		3.92	
DAC-HY-22	22C	19.0		1.00		51.0		29.0		52.6		28500		18.5		621		3.21	
DAC-HY-23	23C	28.0		1.00		32.0		39.0		44.2		40500		15.9		1610		3.78	
DAC-HY-24	24C	23.0		2.00		23.0		52.0		35.5		61500		25.0		5650		5.85	
DAC-HY-25	25C	33.0		0.00		15.0		52.0		37.7		45200		28.6		2690		6.32	
DAC-HY-26	26C	29.0		1.00		10.0		60.0		37.6		47900		19.2		5290		6.08	
DAC-HY-27	27C	30.0		2.00		11.0		57.0		44.6		39400		30.7		1670	J	3.76	
DAC-HY-28	28C	37.0		0.00		10.0		53.0		39.8		46300		19.3		2970		4.92	
DAC-CR-02	02C-REF	5.00		4.00		59.0		32.0		68.8		13700		5.49		1.46	U	0.981	
DAC-CR-02A	02AC-REF	9.00		0.00		25.0		66.0		61.1		16100		2.50		4.03		0.740	
DAC-HY-30	30C-REF	36.0		1.00		16.0		47.0		49.36		39000		9.66		961		2.42	
DAC-HY-35	35C-REF	29.0		3.00		32.0		36.0		55.0		27800		3.53		172		1.71	

Concentration of Metals in Surface Sediments of the Hylebos Waterway and Reference Stations using Strong Acid Digestion (mg/kg DW)

		Antimony		Arsenic		Cadmium		Chromium		Copper		Lead		Mercury		Nickel		Silver		Zinc	
Station	Sample	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.
DAC-HY-01	01C	0.995	U	13.0	U	0.184		22.7		48.5		21.5		0.222	UJ	14.6		0.269		63.4	
DAC-HY-02	02C	0.995	U	16.6		0.255		30.9		76.4		58.9		0.304	UJ	18.0		0.325		98.1	
DAC-HY-03	03C	0.995	U	14.2		0.261		32.4		152		72.3		0.387	UJ	19.3		0.429		142	
DAC-HY-04	04C	0.995	U	13.0	U	0.281		28.0		98.0		47.4		0.255	UJ	18.5		0.396		124	
DAC-HY-05	05C	0.995	U	13.0	U	0.234		29.3		80.2		54.0		0.268	UJ	16.7		0.416		97.7	
DAC-HY-06	06C	0.995	U	20.7		0.331		35.9		80.2		68.6		0.365	UJ	22.7		0.356		130	
DAC-HY-07	07C	0.995	U	13.0	U	0.206		28.2		76.1		58.5		0.241	UJ	19.6		0.315		103	
DAC-HY-08	08C	0.995	U	27.6		0.400		32.5		82.3		82.5		0.487	UJ	24.6		0.334		97.2	
DAC-HY-09	09C	0.995	U	18.6		0.292		27.6		84.0		66.3		0.317	UJ	17.9		0.399		109	
DAC-HY-10	10C	0.995	U	13.0	U	0.343		32.8		110		176		0.395	UJ	25.7		0.473		129	
DAC-HY-11	11C	0.995	U	13.9		0.335		28.3		83.7		57.9		0.348	U	19.1		0.391		97.4	
DAC-HY-12	12C	0.995	U	21.4		0.308		27.8		89.7		68.5		0.392	UJ	18.1		0.424		104	
DAC-HY-13	13C	0.995	U	21.6		0.230		28.9		59.2		33.0		0.239	UJ	18.8		0.198		71.4	
DAC-HY-14	14C	1.12		14.9		0.236		23.1		71.3		40.7		0.242	UJ	16.9		0.229		86.6	
DAC-HY-15	15C	0.995	U	34.6		0.447		36.6		115		75.4		0.459	UJ	22.2		0.465		132	
DAC-HY-16	16C	0.995	U	34.6		0.560		37.3		125		64.4		0.528	UJ	23.7		0.449		530	
DAC-HY-17	17C	2.07		22.4		0.202		20.3		43.4		35.2		0.207	UJ	15.6		0.112		95.5	
DAC-HY-18	18C	1.46		41.1		0.618		33.7		121		72.3		0.558	UJ	24.9		0.481		173	
DAC-HY-19	19C	1.45		42.0		0.676		32.6		120		74.1		0.595	UJ	28.4		0.438		169	
DAC-HY-20	20C	0.995	U	48.9		0.762		49.3		155		90.8		0.759	UJ	35.1		0.507		243	
DAC-HY-21	21C	1.17		51.5		0.830		36.4		147		89.1		0.801	UJ	39.5		0.461		221	
DAC-HY-22	22C	1.12		47.2		0.685		30.8		114		68.9		0.605	UJ	26.5		0.341		200	
DAC-HY-23	23C	1.36		52.6		1.14		34.5		166		84.2		0.578	UJ	31.4		0.356		380	
DAC-HY-24	24C	1.83		54.5		1.18		45.6		151		77.9		0.976	UJ	21.2		0.352		329	
DAC-HY-25	25C	2.27		63.4		1.35		48.8		184		83.2		0.911	UJ	18.0		0.399		376	
DAC-HY-26	26C	1.54		54.5		1.05		50.2		181		91.0		0.997	UJ	38.2		0.460		347	
DAC-HY-27	27C	0.995	U	40.5		0.694		40.7		115		52.1		0.619	UJ	22.5		0.257		210	
DAC-HY-28	28C	0.995	U	38.4		1.50	U	43.6		140		65.0		0.747	UJ	32.7		0.438		263	
DAC-CR-02	02C-REF	0.995	U	13.0	U	0.156		25.8		12.2		4.02		0.084	UJ	20.4		0.045		37.5	
DAC-CR-02A	02AC-REF	0.995	U	13.0	U	0.311		31.4		18.7		6.09		0.113	UJ	27.4		0.096		51.3	
DAC-HY-30	30-C-REF	0.995	U	13.0	U	0.207	U	28.3		55.7		27.3		0.386	UJ	20.3		0.371		86.5	
DAC-HY-35	35C-REF	0.995	U	13.0	U	0.195		23.3		53.8		32.5		0.279	UJ	18.1		0.356		95.8	
DAC-HY-26	26FB	0.995	U	13.0	U	0.005	U	0.967	U	2.70		0.179	U	0.248	U	0.780		0.018	U	1.90	U
DAC-HY-05	05CCB	0.995	U	13.0	U	0.005	U	0.967	U	3.49		0.179	U	0.055	U	0.600	U	0.018	U	2.93	

Concentration of Metals in Surface Sediments of the Hylebos Waterway and Reference Stations using Total Acid Digestion (mg/kg DW)

		Antimony		Arsenic		Cadmium		Chromium		Copper		Lead		Mercury		Nickel		Silver		Zinc	
Station	Sample	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.
DAC-HY-01	01C	1.73		5.45		0.216	U	29.0		53.6		23.4		0.082	UJ	24.8		0.189		109	
DAC-HY-02	02C	5.81		15.2		0.303	U	31.5		90.7		44.9		0.221	UJ	28.8		0.229		135	
DAC-HY-03	03C	3.40		12.9		0.296	U	31.6		159		50.3		0.160		28.6		0.309		210	
DAC-HY-04	04C	4.40		10.7		0.298	U	31.4		121		63.0		0.195	UJ	28.3		0.259		176	
DAC-HY-05	05C	3.10		12.2		0.301	U	31.2		80.8		40.8		0.200	UJ	27.7		0.268		119	
DAC-HY-06	06C	3.05		15.0		0.405	U	31.0		79.1		73.9		0.281	UJ	35.0		0.264		142	
DAC-HY-07	07C			10.8		0.323	U	29.1		84.4		56.4		0.209	UJ	30.7		0.254		145	
DAC-HY-08	08C	3.44		17.3		0.456		30.5		94.7		86.4		0.303	UJ	36.4		0.295		135	
DAC-HY-09	09C	2.87		11.3		0.318		30.5		104		64.2		0.206	UJ	29.9		0.307		155	
DAC-HY-10	10C	4.59		8.64		0.339		91.7		113		158		0.239	UJ	32.8		0.328		161	
DAC-HY-11	11C	3.28		15.8		0.382		29.2		94.5		59.6		0.250	U	30.0		0.309		140	
DAC-HY-12	12C	3.84		16.0		0.356		28.7		103		65.1		0.248	UJ	30.2		0.306		113	
DAC-HY-13	13C	3.69		7.88		0.241		29.2		60.7		30.7		0.116	UJ	27.1		0.140		105	
DAC-HY-14	14C	15.2		21.1		0.269		35.2		77.6		55.3		0.152	UJ	28.2		0.173		144	
DAC-HY-15	15C	10.9		15.8		0.383		35.0		132		89.3		0.358	UJ	32.1		0.368		173	
DAC-HY-16	16C	7.88		34.9		0.477		37.1		136		83.1		0.393	UJ	37.5		0.363		579	
DAC-HY-17	17C	4.57		9.92		0.202		28.7		53.8		207		0.174	UJ	29.5		0.095		99.4	
DAC-HY-18	18C	10.4		17.5		0.474		34.8		130		87.9		0.366	UJ	34.4		0.325		213	
DAC-HY-19	19C	14.1		40.1		0.529		33.6		135		95.5		2.70	UJ	36.7		0.340		217	
DAC-HY-20	20C	10.6		45.9		0.674		36.2		160		105		0.569	UJ	40.3		0.370		261	
DAC-HY-21	21C	16.5		32.2		0.703		39.3		161		103		0.774	UJ	43.7		0.398		279	
DAC-HY-22	22C	7.13		30.9		0.492		34.4		101		57.0		0.357	UJ	35.9		0.206		196	
DAC-HY-23	23C	16.5		22.9		1.07		39.8		190		105		0.414	UJ	39.8		0.288		434	
DAC-HY-24	24C	11.6		120		1.95		39.4		154		114		2.73	UJ	38.2		0.248		295	
DAC-HY-25	25C	13.8		61.4		1.36		40.7		230		122		0.631	UJ	39.4		0.289		384	
DAC-HY-26	26C	14.5		55.1		0.981		40.4		183		129		0.715	UJ	41.2		0.289		324	
DAC-HY-27	27C	6.77		97.6		0.633		33.7		127		64.0		0.396	UJ	36.4		0.202		216	
DAC-HY-28	28C	8.59		37.0		0.803		38.8		141		73.6		0.501	UJ	38.8		0.245		250	
DAC-CR-02	02C-FEF	1.22	U	3.06		0.348		61.4		16.0		10.4		0.038	UJ	33.9		0.076		17.2	
DAC-CR-02A	02AC-REF	1.22	U	1.87		0.180		45.8		9.80		8.49		0.024	UJ	27.5		0.043		15.7	U
DAC-HY-30	30C-FEF	1.22	U	6.41		0.295		27.7		71.4		28.7		0.251	UJ	26.1		0.240		75.5	
DAC-HY-35	35C-FEF	1.22	U	6.61		0.217		20.9		52.1		40.9		0.169	UJ	24.6		0.217		64.6	
DAC-HY-26	26FB	1.22	U	0.136	U	0.046	U	1.75	U	0.602	U	0.486	U	0.024	U	0.783	U	0.007	U	15.7	U
DAC-HY-05	05CCB	1.22	U	0.136	U	0.046	U	1.75	U	0.602	U	0.486	U	0.024	U	0.783	U	0.007	U	15.7	U

Concentration of Organotin Compounds in Surface Sediments of the Hylebos Waterway and Reference Stations (ug/kg DW)

Station	Sample	Monobutyltin Conc.	Qual.	Dibutyltin Conc.	Qual.	Tributyltin Conc.	Qual.	Tetrabutyltin Conc.	Qual.
DAC-HY-01	01C	7.13	U	13.2		37.1		7.13	U
DAC-HY-02	02C	6.60	U	19.0		43.6		6.60	U
DAC-HY-03	03C	8.28	U	82.8		236		8.28	U
DAC-HY-04	04C	7.12	U	54.1		122		7.12	U
DAC-HY-05	05C	8.39	U	22.4		64.8		8.39	U
DAC-HY-06	06C	7.31	U	7.31	U	35.1		7.31	U
DAC-HY-07	07C	6.63	U	33.4		90.2		6.63	U
DAC-HY-08	08C	9.32	U	9.32	U	31.0		9.32	U
DAC-HY-09	09C	9.20	U	52.3		169		9.20	U
DAC-HY-10	10C	10.4	U	52.5		179		10.4	U
DAC-HY-11	11C	7.93	U	10.8		50.6		7.93	U
DAC-HY-12	12C	8.63	U	42.7		78.8		8.63	U
DAC-HY-13	13C	6.25	U	6.25	U	14.9		6.25	U
DAC-HY-14	14C	7.58	U	12.2		140		7.58	U
DAC-HY-15	15C	9.71	U	32.0		133		9.71	U
DAC-HY-16	16C	9.79	U	41.7		199		9.79	U
DAC-HY-17	17C	5.78	U	5.78	U	15.5		5.78	U
DAC-HY-18	18C	10.4	U	32.2		184		10.4	U
DAC-HY-19	19C	9.78	U	55.7		218		9.77	U
DAC-HY-20	20C	11.1	U	70.3		225		11.1	U
DAC-HY-21	21C	11.8	U	64.1		174		11.8	U
DAC-HY-22	22C	7.01	U	47.0		81.9		7.01	U
DAC-HY-23	23C	10.7	U	73.7		128		10.7	U
DAC-HY-24	24C	12.8	U	70.0		212		12.8	U
DAC-HY-25	25C	12.7	U	79.1		238		12.7	U
DAC-HY-26	26C	11.9	U	82.6		181		11.9	U
DAC-HY-27	27C	10.6	U	46.5		136		10.6	U
DAC-HY-28	28C	11.6	U	35.5		174		11.6	U
DAC-CR-02	02C-REF	5.75	U	5.75	U	5.75	U	5.75	U
DAC-CR-02A	02AC-REF	7.26	U	7.26	U	7.26	U	7.26	U
DAC-HY-30	30C-REF	10.5	U	19.9		25.5		10.5	U
DAC-HY-35	35C-REF	7.14	U	7.14	U	7.14	U	7.14	U

Concentrations of Semivolatile Organic Compounds in Surface Sediments of the Hylebos Waterway and Reference Stations (ug/kg DW)

Station	Sample	2-Methylnaphthalene		Acenaphthene		Acenaphthylene		Anthracene		Fluorene		Total low molecular weight PAHs	
		Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.
DAC-HY-01	01C	57.0		17.0		9.80		71.0		31.0		372	
DAC-HY-02	02C	61.0		46.0		19.0		130		64.0		789	
DAC-HY-03	03C	150	J	190		22.0		740	J	310	J	2880	J
DAC-HY-04	04C	87.0		61.0		20.0		170		71.0		902	
DAC-HY-05	05C	100		51.0		25.0		800		190		2170	
DAC-HY-06	06C	130		110		19.0		270		150		1470	
DAC-HY-07	07C	130		64.0		21.0		520		110		1460	
DAC-HY-08	08C	190		86.0		47.0		310		140		1530	
DAC-HY-09	09C	120		63.0		19.0		300		110		1360	
DAC-HY-10	10C	110		87.0		26.0		330		140		1610	
DAC-HY-11	11C	75.0		38.0		21.0		160		60.0		769	
DAC-HY-12	12C	100		62.0		30.0		250		97.0		1150	
DAC-HY-13	13C	100		61.0		23.0		120		68.0		862	
DAC-HY-14	14C	65.0		34.0		22.0		110		47.0		643	
DAC-HY-15	15C	83.0		56.0		32.0		290		97.0		1220	
DAC-HY-16	16C	72.0		44.0		23.0		160	J	66.0	J	913	J
DAC-HY-17	17C	21.0		11.0		5.30		60.0		18.0		248	
DAC-HY-18	18C	73.0		41.0		21.0		240		73.0		985	
DAC-HY-19	19C	83.0		140		26.0		450		150		2030	
DAC-HY-20	20C	63.0		44.0		20.0		270		71.0		1080	
DAC-HY-21	21C	72.0		57.0		25.0		300		83.0		1160	
DAC-HY-22	22C	47.0		42.0		13.0		430		69.0		2640	
DAC-HY-23	23C	51.0		42.0		16.0		250		66.0		964	
DAC-HY-24	24C	59.0		61.0		17.0		990		170		2100	
DAC-HY-25	25C	53.0		40.0		22.0		270		68.0		955	J
DAC-HY-26	26C	42.0		28.0		22.0		170		60.0		728	
DAC-HY-27	27C	33.0		23.0		14.0		130		39.0		531	J
DAC-HY-28	28C	57.0		35.0		20.0		240		70.0		841	J
DAC-CR-02	02C-REF	0.700	U	0.820	U	0.480	U	0.420	U	0.660	U	6.58	<
DAC-CR-02A	02AC-REF	2.30		1.90	U	1.10	U	1.40		1.50	U	16.9	<
DAC-HY-30	30C-REF	63.0		66.0		12.0		190		82.0		1062	J
DAC-HY-35	35C-REF	99.0		100		23.0		230		110		1450	
DAC-HY-05	05CCB	1.10	U	1.40	U	0.830	U	0.740	U	1.10	U	6.69	
DAC-HY-22	22FB	0.650	U	0.760	U	0.440	U	0.390	U	0.610	U	3.04	

Concentrations of Semivolatile Organic Compounds in Surface Sediments of the Hylebos Waterway and Reference Stations (ug/kg DW) (Continued)

Station	Sample	Naphthalene		Phenanthrene		Dibenz(a,h)anthracene		Benz(a)anthracene		Benzo(a)pyrene		Benzo(g,h,i)perylene		Chrysene	
		Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.
DAC-HY-01	01C	83.0		160		15.0		98.0		92.0		65.0		140	
DAC-HY-02	02C	130		400		38.0		200		230		160		290	
DAC-HY-03	03C	220		1400	J	110		990		800		410		1200	
DAC-HY-04	04C	160		420		51.0		340		340		200		480	
DAC-HY-05	05C	170		830		56.0		560		390		220		810	
DAC-HY-06	06C	260		660		61.0		420		410		250		610	
DAC-HY-07	07C	200		550		55.0		520		400		220		680	
DAC-HY-08	08C	300		650		80.0		530		520		410		1100	
DAC-HY-09	09C	300		570		67.0		520		420		250		760	
DAC-HY-10	10C	240		790		92.0		710		620		360		1100	
DAC-HY-11	11C	150		340		57.0		350		350		240		610	
DAC-HY-12	12C	230		480		94.0		590		590		350		1000	
DAC-HY-13	13C	320		270		24.0		180		150		110		330	
DAC-HY-14	14C	170		260		45.0		240		280		190		470	
DAC-HY-15	15C	200		540		110		520		550		450		1100	
DAC-HY-16	16C	150		470		110		390		550		460		880	
DAC-HY-17	17C	54.0		100		46.0		130		290		230		430	
DAC-HY-18	18C	130		480		140		510		720		620		1300	
DAC-HY-19	19C	160		1100		200		850		1100		940		2200	
DAC-HY-20	20C	140		530		190		730		910		870		1800	
DAC-HY-21	21C	130		560		210		670		1000		880		1800	
DAC-HY-22	22C	91.0		2000		150		640		700		590		1500	
DAC-HY-23	23C	100		490		210		770		1100		870		1900	
DAC-HY-24	24C	86.0		780		340		1900		1800		1300		3700	
DAC-HY-25	25C	85.0		470	J	280		740		1300		1000		2100	
DAC-HY-26	26C	78.0		370	J	240		470		1000		870		1500	
DAC-HY-27	27C	55.0		270	J	150		330		690		550		980	
DAC-HY-28	28C	66.0		410	J	180		670		850		640		1600	
DAC-CR-02	02C-REF	1.30		2.90		0.720	U	0.570	U	0.550	U	0.680	U	2.10	
DAC-CR-02A	02AC-REF	4.00		7.00		1.10	U	3.50		3.50		4.90		6.40	
DAC-HY-30	30C-REF	94.0		550	J	43.0		240		260		170		340	
DAC-HY-35	35C-REF	170		820		34.0		340		250		150		370	
DAC-HY-05	05CCB	1.90	U	0.720	U	0.830	U	0.650	U	0.660	U	0.780	U	0.600	U
DAC-HY-22	22FB	0.450	U	0.390	U	0.530	U	0.420	U	0.410	U	0.500	U	0.390	U

Concentrations of Semivolatile Organic Compounds in Surface Sediments of the Hylebos Waterway and Reference Stations (ug/kg DW) (Continued)

Station	Sample	Fluoranthene		Total high molecular weight PAHs		Indeno(1,2,3-c,d)pyrene		Pyrene		Total benzofluoranthenes		2-Methylphenol	
		Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.
DAC-HY-01	01C	240		1270		61.0		320		240		2.90	U
DAC-HY-02	02C	570		2970		160		760		560		4.50	U
DAC-HY-03	03C	2400	J	10200	J	440		1900	J	1900		6.90	U
DAC-HY-04	04C	900		4380		200		1000		870		4.70	U
DAC-HY-05	05C	1600		6160		220		1300		1000		5.50	U
DAC-HY-06	06C	970		5200		250		1300		930		6.30	U
DAC-HY-07	07C	1200		5540		230		1300		930		5.10	
DAC-HY-08	08C	1100		7190		350		1500		1600		9.50	
DAC-HY-09	09C	1400		6070		250		1300		1100		11.0	
DAC-HY-10	10C	1900		8450		370		1600		1700		12.0	
DAC-HY-11	11C	830		4750		210		1000		1100		7.30	
DAC-HY-12	12C	1100		6970		350		1300		1600		9.40	
DAC-HY-13	13C	560		2520		91.0		630		440		6.20	
DAC-HY-14	14C	600		3620		170		780		840		18.0	
DAC-HY-15	15C	1200		7640		410		1500		1800		8.00	U
DAC-HY-16	16C	970		6960		400		1400		1800		8.20	
DAC-HY-17	17C	300		3450		180		950		890		1.80	
DAC-HY-18	18C	1400		9620		530		2100		2300		23.0	
DAC-HY-19	19C	2200		15500		800		3800		3400		7.50	
DAC-HY-20	20C	1800		12700		720		2400		3300		8.40	U
DAC-HY-21	21C	1700		13200		780		2800		3400		7.80	
DAC-HY-22	22C	2900		12100		540		2700		2400		4.70	
DAC-HY-23	23C	1600		13400		750		2300		3900		10.0	
DAC-HY-24	24C	6100		28500		1100		5700		6600		14.0	
DAC-HY-25	25C	2000	J	16600	J	930		3400		4800		7.90	U
DAC-HY-26	26C	1100	J	12400	J	800		2500		3900		8.80	U
DAC-HY-27	27C	1100	J	8590	J	490		1800		2500		4.80	U
DAC-HY-28	28C	2200	J	11800	J	600		2100		3000		7.30	U
DAC-CR-02	02C-REF	6.10		17.4	<	0.720	U	4.90		1.10		2.00	U
DAC-CR-02A	02AC-REF	15.0		62.1	<	3.70		12.0		12.0		1.90	U
DAC-HY-30	30C-REF	670		3183	J	180		750		530		4.60	U
DAC-HY-35	35C-REF	780		3410		140		890		460		4.50	U
DAC-HY-05	05CCB	0.650	U	6.25		0.870	U	0.620	U	0.590	U	0.640	U
DAC-HY-22	22FB	0.360	U	3.89		0.530	U	0.350	U	0.400	U	10.0	U

Concentrations of Semivolatile Organic Compounds in Surface Sediments of the Hylebos Waterway and Reference Stations (ug/kg DW) (Continued)

		2,4-Dimethylphenol		4-Methylphenol		Pentachlorophenol		Phenol		1,2-Dichlorobenzene		1,2,4-Trichlorobenzene		1,3-Dichlorobenzene	
Station	Sample	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.
DAC-HY-01	01C	3.70		26.0		13.0	J	33.0		1.50		6.90		1.20	
DAC-HY-02	02C	4.40		23.0		27.0	J	38.0		4.10		29.0		3.10	
DAC-HY-03	03C	8.30		33.0		56.0	J	57.0		5.50		16.0		2.20	
DAC-HY-04	04C	5.60		27.0		55.0	J	45.0		4.00		22.0		3.00	
DAC-HY-05	05C	5.10		26.0		40.0	J	45.0		4.70		31.0		3.90	
DAC-HY-06	06C	6.10		20.0		35.0	J	40.0		10.0		97.0		11.0	
DAC-HY-07	07C	9.80		20.0		45.0	J	39.0		4.90		45.0		5.20	
DAC-HY-08	08C	13.0		120		37.0	J	38.0		10.0		74.0		11.0	
DAC-HY-09	09C	11.0		40.0		790	J	49.0		8.50		59.0		9.80	
DAC-HY-10	10C	18.0		38.0		180	J	45.0		13.0		110		14.0	
DAC-HY-11	11C	7.50		27.0		64.0	J	40.0		5.90		42.0		6.30	
DAC-HY-12	12C	12.0		34.0		150	J	44.0		5.30		35.0		5.30	
DAC-HY-13	13C	7.10		37.0		17.0	J	30.0		1.40		7.40		1.60	U
DAC-HY-14	14C	4.90		24.0		26.0	J	27.0		2.40		15.0		2.50	U
DAC-HY-15	15C	11.0		43.0		53.0	J	38.0		3.10		19.0		3.00	
DAC-HY-16	16C	7.90		40.0		95.0	J	42.0		3.70		22.0		4.10	
DAC-HY-17	17C	12.0		16.0		15.0	J	53.0		2.00		14.0		2.30	
DAC-HY-18	18C	10.0		32.0		69.0	J	38.0		4.60		30.0		5.30	
DAC-HY-19	19C	9.70		42.0		72.0	J	44.0		6.70		40.0		7.00	
DAC-HY-20	20C	16.0		40.0		75.0	J	68.0		3.60		25.0		4.00	
DAC-HY-21	21C	11.0		42.0		91.0	J	47.0		6.60		37.0		6.70	
DAC-HY-22	22C	6.50		22.0		42.0	J	33.0		4.50		21.0		4.10	
DAC-HY-23	23C	8.20		44.0		52.0	J	53.0		3.40		15.0		2.80	
DAC-HY-24	24C	11.0		72.0		55.0	J	53.0		3.00		12.0		3.00	
DAC-HY-25	25C	8.00		53.0		74.0	J	57.0		3.40		14.0		2.90	
DAC-HY-26	26C	7.10		53.0		93.0	J	56.0		2.40		11.0		2.30	
DAC-HY-27	27C	4.90		36.0		52.0	J	43.0		2.00		7.70		1.60	
DAC-HY-28	28C	7.50		49.0		65.0	J	49.0		2.00		8.00		1.90	
DAC-CR-02	02C-REF	0.410		3.90		0.760	J	21.0		0.300	U	0.270	U	0.260	U
DAC-CR-02A	C2AC-REF	1.50		4.00		0.700	J	16.0	U	0.400	U	0.320	U	0.380	U
DAC-HY-30	30C-REF	4.40		25.0		13.0	J	31.0		1.60		2.50		1.00	
DAC-HY-35	35C-REF	6.00		32.0		7.80	J	31.0		1.80		2.00		0.690	
DAC-HY-05	05CCB	0.670	U	1.20		0.340	U	26.0		0.480	U	0.420	U	0.470	U
DAC-HY-22	22FB	0.440	U	0.660		0.480	U	16.0	U	0.350	U	0.310	U	0.390	

Concentrations of Semivolatile Organic Compounds in Surface Sediments of the Hylebos Waterway and Reference Stations (ug/kg DW) (Continued)

		1,4-Dichlorobenzene		Hexachlorobutadiene		Di-n-octyl phthalate		Bis(2-ethylhexyl)phthalate		Butylbenzy phthalate		Diethyl phthalate		Dimethyl phthalate	
Station	Sample	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.
DAC-HY-01	01C	8.60	U	14.0		3.00		94.0	J	12.0	J	3.30	UJ	2.40	J
DAC-HY-02	02C	19.0		49.0		3.30		89.0	J	8.70	UJ	2.80	UJ	2.30	J
DAC-HY-03	03C	61.0		25.0		11.0		470	J	35.0	J	2.20	UJ	7.90	J
DAC-HY-04	04C	47.0		37.0		7.70		250	J	20.0	J	2.60	UJ	5.20	J
DAC-HY-05	05C	31.0		75.0		5.30		550	J	15.0	J	3.00	UJ	8.90	J
DAC-HY-06	06C	81.0		150		10.0		140	J	9.70	J	2.50	UJ	4.80	J
DAC-HY-07	07C	25.0		260		5.40		270	J	8.80	UJ	2.60	UJ	14.0	J
DAC-HY-08	08C	35.0		240		5.80		160	J	13.0		4.20	U	5.20	
DAC-HY-09	09C	40.0		220		9.90		1100	J	22.0		2.50	U	9.60	
DAC-HY-10	10C	50.0		120		14.0		460	J	46.0		5.10	U	47.0	
DAC-HY-11	11C	28.0		66.0		7.70		310	J	20.0		3.90	U	11.0	
DAC-HY-12	12C	44.0		62.0		11.0		330	J	36.0		4.50	U	12.0	
DAC-HY-13	13C	7.30	U	16.0		2.70		100	J	5.10	U	2.30	U	6.90	
DAC-HY-14	14C	12.0		23.0		4.00		180	J	19.0		3.00	U	6.20	
DAC-HY-15	15C	17.0	U	25.0		8.70		520	J	63.0		4.30	UJ	33.0	J
DAC-HY-16	16C	20.0		25.0		3.80	J	580	J	93.0		6.10	U	38.0	
DAC-HY-17	17C	5.70	U	8.80		1.90		71.0	UJ	8.10	UJ	1.90	UJ	0.960	J
DAC-HY-18	18C	21.0		24.0		8.20		560	J	67.0	J	3.30	UJ	32.0	J
DAC-HY-19	19C	22.0		27.0		7.10		500	J	53.0	J	3.00	UJ	30.0	J
DAC-HY-20	20C	17.0	U	19.0		7.60		760	J	120		4.10	UJ	55.0	J
DAC-HY-21	21C	23.0		24.0		5.80		770	J	82.0	J	6.40	UJ	65.0	J
DAC-HY-22	22C	14.0		17.0		7.90		600	J	70.0	J	0.520	UJ	19.0	J
DAC-HY-23	23C	15.0	U	12.0		14.0		920	J	580		3.40	UJ	36.0	J
DAC-HY-24	24C	16.0	U	12.0		12.0	J	1400	J	150	J	8.30	UJ	75.0	J
DAC-HY-25	25C	16.0		9.60		12.0		1000	J	88.0		3.30	UJ	48.0	
DAC-HY-26	26C	12.0		6.60		6.40		920	J	55.0		5.00	UJ	54.0	
DAC-HY-27	27C	10.0		5.70		13.0		1200	J	67.0		2.10	UJ	60.0	
DAC-HY-28	28C	13.0		6.80		11.0		1200	J	100		1.80	UJ	67.0	
DAC-CR-02	02C-REF	1.20	U	1.10	U	0.190	U	7.90	U	0.970	UJ	2.10	UJ	0.210	J
DAC-CR-02A	02AC-REF	1.80	U	1.50	U	0.350	U	18.0	UJ	1.90	U	2.50	U	0.420	UJ
DAC-HY-30	30C-REF	10.0		3.30		7.80		150	J	13.0		3.20	UJ	20.0	
DAC-HY-35	35C-REF	7.70	U	3.20		1.80		97.0	J	5.70	UJ	2.70	UJ	5.50	J
DAC-HY-05	05CCB	1.60	U	1.50	U	0.960		140	J	1200		4.00	U	0.250	U
DAC-HY-22	22FB	1.00	U	1.20	U	2.70		900	J	24.0	J	1.50	U	0.085	U

Concentrations of Semivolatile Organic Compounds in Surface Sediments of the Hylebos Waterway and Reference Stations (ug/kg DW) (Continued)

		Di-n-butyl phthalate		Gamma-HCH (Lindane)		Hexachlorobenzene		Aldrin		Alpha-chlordane		Gamma-chlordane		Chlordane	
Station	Sample	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.
DAC-HY-01	01C	72.0	J	0.470		11.0		0.088	U	0.610		0.910		1.50	
DAC-HY-02	02C	6.20	UJ	0.990		20.0		0.065	U	2.00		2.10		4.10	
DAC-HY-03	03C	30.0	UJ	0.840		22.0		8.00		1.90		0.070	U	1.90	
DAC-HY-04	04C	14.0	UJ	0.940		22.0		0.076	U	1.80		2.90		4.70	
DAC-HY-05	05C	76.0	J	1.20		41.0		0.078	U	1.90		3.20		5.10	
DAC-HY-06	06C	6.20	UJ	2.00		63.0		0.062	U	3.00		4.20		7.20	
DAC-HY-07	07C	13.0	UJ	2.60		64.0		0.500		2.40		5.90		8.30	
DAC-HY-08	08C	9.40	U	3.00		54.0		0.086	U	3.40		0.062	U	3.40	
DAC-HY-09	09C	30.0	U	4.80		120		0.040	U	2.00		3.40		5.40	
DAC-HY-10	10C	25.0	U	3.80		64.0		0.043	U	5.10		2.20		7.30	
DAC-HY-11	11C	14.0	U	1.90		40.0		0.081	U	2.00		2.50		4.50	
DAC-HY-12	12C	11.0	U	1.90		45.0		0.088	U	2.90		0.064	U	2.90	
DAC-HY-13	13C	5.50	U	0.670		12.0		0.076	U	0.670		1.70		2.40	
DAC-HY-14	14C	8.50	U	0.740		16.0		0.075	U	1.10		2.00		3.20	
DAC-HY-15	15C	21.0	UJ	1.40		28.0		0.082	U	1.20		0.080	U	1.20	
DAC-HY-16	16C	26.0	U	1.20		23.0		6.30		1.80	J	4.10	J	5.90	
DAC-HY-17	17C	5.90	UJ	1.00		9.90		0.057	U	1.10		1.00		2.10	
DAC-HY-18	18C	20.0	UJ	1.10		21.0		0.067	U	1.90		0.065	U	1.90	
DAC-HY-19	19C	15.0	UJ	1.40		21.0		0.061	U	2.30		0.060	U	2.30	
DAC-HY-20	20C	34.0	UJ	1.30		23.0		0.082	U	1.50		0.080	U	1.50	
DAC-HY-21	21C	30.0	UJ	1.80		29.0		0.066	U	3.00		3.50		6.40	
DAC-HY-22	22C	24.0	UJ	0.780		12.0		0.059	U	1.30		0.058	U	1.30	
DAC-HY-23	23C	28.0	UJ	0.590		11.0		7.70		1.20		4.10		5.30	
DAC-HY-24	24C	79.0	UJ	0.610		12.0		6.70		1.40		0.480		1.90	
DAC-HY-25	25C	23.0	UJ	0.760		13.0		5.30		2.00		1.20		3.10	
DAC-HY-26	26C	17.0	UJ	0.550		12.0		5.20		2.60		0.130	U	2.70	
DAC-HY-27	27C	20.0	UJ	0.410		8.10		3.30		1.80		4.20		6.00	
DAC-HY-28	28C	23.0	UJ	0.400		8.70		4.10		2.50		0.550		3.10	
DAC-CR-02	02C-REF	2.70	UJ	0.070		0.110	U	0.100		0.130		0.110		0.240	
DAC-CR-02A	C2AC-REF	5.40	UJ	0.110	U	0.180		0.082	U	0.390		0.550		0.940	
DAC-HY-30	30C-REF	11.0	UJ	0.530		4.60		0.090	U	0.540		0.097	U	0.540	
DAC-HY-35	35C-REF	6.80	UJ	0.210		4.30		0.120	U	0.350		1.80		2.20	
DAC-HY-05	05CCB	1800	J	0.068	U	0.064	U	0.062	U	0.140		0.120			
DAC-HY-22	22FB	2900	J	0.037	U	0.480		0.066	U	0.045	U	0.048			

Concentrations of Semivolatile Organic Compounds in Surface Sediments of the Hylebos Waterway and Reference Stations (ug/kg DW) (Continued)

Station	Sample	Dieldrin		Heptachlor		Chlorobiphenyl 10/209		Chlorobiphenyl 3/18		Chlorobiphenyl 3/28		Chlorobiphenyl 4/44		Chlorobiphenyl 4/52	
		Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.
DAC-HY-01	01C	0.120		0.200		12.0		2.10		0.510	U	1.30	U	0.800	
DAC-HY-02	02C	0.520		0.800		35.0		5.40		3.20		3.10	U	4.50	
DAC-HY-03	03C	0.750		0.500		25.0		4.50		2.30	U	3.10	U	2.10	
DAC-HY-04	04C	0.590		0.500		15.0		5.70		2.90		3.00		3.10	
DAC-HY-05	05C	0.790		0.800		40.0		6.20		3.40		3.50	U	3.10	
DAC-HY-06	06C	1.40		1.90		57.0		5.80		6.20		6.40		7.00	
DAC-HY-07	07C	0.340		4.10		29.0		12.0		5.70		4.40	U	3.10	
DAC-HY-08	08C	1.40		1.90		140		11.0		9.00		10.0		5.10	
DAC-HY-09	09C	1.40		4.10		12.0		22.0		3.90		2.60	U	3.60	
DAC-HY-10	10C	2.30		0.500		16.0		15.0		3.60		2.40	U	9.50	
DAC-HY-11	11C	1.60		0.800		25.0		9.90		2.40		4.70	U	4.20	
DAC-HY-12	12C	2.50		0.400		19.0		10.0		3.60		4.40	U	4.60	
DAC-HY-13	13C	0.055	U	0.400		6.00		3.40		0.880	U	1.60	U	2.70	
DAC-HY-14	14C	0.054	U	0.500		10.0		4.10		1.40		4.00	U	4.50	
DAC-HY-15	15C	1.90		1.80		22.0		3.80		2.20		6.90		8.90	
DAC-HY-16	16C	1.30		0.700		26.0		4.70		4.10		8.50		9.20	
DAC-HY-17	17C	0.057	U	1.10		9.50		6.40		4.10		9.80		31.0	
DAC-HY-18	18C	1.20		1.60		22.0		11.0		6.30		8.70	U	16.0	
DAC-HY-19	19C	0.062	U	0.900		19.0		14.0		9.50		12.0		20.0	
DAC-HY-20	20C	3.50		1.40		19.0		5.90		5.00		10.0		16.0	
DAC-HY-21	21C	3.30		0.800		22.0		21.0		8.80		11.0		16.0	
DAC-HY-22	22C	1.40		0.400		11.0		8.60		6.10		7.20	U	11.0	
DAC-HY-23	23C	1.50		0.500		13.0		8.70		12.0		12.0		17.0	
DAC-HY-24	24C	1.40		0.400		9.30		5.90		8.50		11.0		14.0	
DAC-HY-25	25C	2.10		0.900		18.0		6.90		8.00		13.0		14.0	
DAC-HY-26	26C	2.20		0.700		17.0		4.10		5.50		13.0		15.0	
DAC-HY-27	27C	2.00		0.500		12.0		3.70		4.40		8.50	U	12.0	
DAC-HY-28	28C	2.30		0.700		10.0		4.00		4.80		8.20	U	11.0	
DAC-CR-02	02C-REF	0.054		0.100		0.055	U	0.190	U	0.180	U	0.530	U	0.180	
DAC-CR-02A	02AC-REF	0.086	U	0.100	U	0.150		0.280	U	0.220		0.560	U	0.210	
DAC-HY-30	30C-REF	0.570		0.300		3.90		2.30		0.770	U	2.00	U	2.10	
DAC-HY-35	35C-REF	0.340		0.100		1.50		2.60		0.980	U	1.20	U	1.70	
DAC-HY-05	05CCB	0.063	U	0.076	U	0.160	U	0.320		0.220	U	0.900	U	0.210	U
DAC-HY-22	22FB	0.048	U	0.029	U	0.500	U	0.180	U	0.170	U	0.510	U	0.130	U

Concentrations of Semivolatile Organic Compounds in Surface Sediments of the Hylebos Waterway and Reference Stations (ug/kg DW) (Continued)

Station	Sample	Chlorobiphenyl 4/66		Chlorobiphenyl 5/101		Chlorobiphenyl 5/105		Chlorobiphenyl 5/118		Chlorobiphenyl 6/128		Chlorobiphenyl 6/138		Chlorobiphenyl 6/153	
		Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.
DAC-HY-01	01C	0.100	U	2.00		1.00		5.40		0.590		2.90		3.50	
DAC-HY-02	02C	6.00		5.60		5.30		31.0		1.50		12.0		7.90	
DAC-HY-03	03C	1.00	U	3.70		1.60		2.30		1.20		5.90		6.20	
DAC-HY-04	04C	4.00		5.00		5.00		22.0		1.40		6.70		7.10	
DAC-HY-05	05C	4.00		7.90		3.70		26.0		3.70		12.0		15.0	
DAC-HY-06	06C	12.0		6.20		7.40		41.0		0.048	U	11.0		8.70	
DAC-HY-07	07C	7.00		3.10		6.50		20.0		0.042	U	8.40		0.070	U
DAC-HY-08	08C	10.0		6.90		4.70		50.0		0.067	U	9.20		15.0	
DAC-HY-09	09C	9.00		1.70		3.30		25.0		0.031	U	5.70		2.90	
DAC-HY-10	10C	9.00		0.060	U	9.40		54.0		3.40		13.0		55.0	
DAC-HY-11	11C	5.00		5.40		7.70		47.0		0.760		14.0		13.0	J
DAC-HY-12	12C	6.00		8.30		8.00		45.0		3.90		19.0		14.0	
DAC-HY-13	13C	2.00		4.80		2.80		13.0		1.30		6.10		9.20	
DAC-HY-14	14C	2.00		8.70		4.70		7.50		3.30		14.0		15.0	
DAC-HY-15	15C	0.100	U	18.0		0.075	U	24.0		5.40		28.0		24.0	
DAC-HY-16	16C	8.00		28.0		11.0		28.0		8.60		37.0		61.0	J
DAC-HY-17	17C	0.100	U	50.0		20.0		63.0		10.0		46.0		47.0	
DAC-HY-18	18C	0.100	U	33.0		13.0		35.0		8.00		43.0		43.0	
DAC-HY-19	19C	6.00		40.0		16.0		40.0		11.0		48.0		48.0	
DAC-HY-20	20C	0.100	U	39.0		0.074	U	50.0		12.0		52.0		40.0	
DAC-HY-21	21C	7.00		35.0		27.0		45.0		0.070	U	45.0		0.120	U
DAC-HY-22	22C	0.100	U	24.0		8.80		33.0		7.00		26.0		30.0	
DAC-HY-23	23C	13.0		33.0		0.085	U	35.0		9.90		43.0		32.0	
DAC-HY-24	24C	0.400		32.0		0.110	U	36.0		6.90		39.0		33.0	
DAC-HY-25	25C	12.0		29.0		9.20		26.0		6.70		35.0		38.0	
DAC-HY-26	26C	10.0		26.0		7.90		19.0		5.70		32.0		36.0	
DAC-HY-27	27C	8.00		21.0		6.60		24.0		5.10		25.0		28.0	
DAC-HY-28	28C	7.00		19.0		7.00		15.0		4.70		24.0		26.0	
DAC-CR-02	02C-REF	0.080	U	0.200	U	0.160		0.250		0.077		0.340	U	0.310	U
DAC-CR-02A	02AC-REF	0.200		0.270		0.075	U	0.390		0.071	U	0.510	U	0.380	
DAC-HY-30	30C-REF	0.200	U	2.50		0.520		2.70		0.710		2.80		3.10	
DAC-HY-35	35C-REF	0.100	U	2.90		1.30		5.10		0.500		4.10		5.40	
DAC-HY-05	05CCB	0.500	U	0.230		0.070	U	0.110	U	0.069		2.80		0.110	U
DAC-HY-22	22FB	0.090	U	0.200	U	0.057	U	0.250		0.051	U	0.290	U	0.140	U

Concentrations of Semivolatile Organic Compounds in Surface Sediments of the Hylebos Waterway and Reference Stations (ug/kg DW) (Continued)

Station	Sample	Chlorobiphenyl 7/170 Conc.	Qual.	Chlorobiphenyl 7/180 Conc.	Qual.	Chlorobiphenyl 7/187 Conc.	Qual.	Chlorobiphenyl 8/195 Conc.	Qual.	Chlorobiphenyl 9/206 Conc.	Qual.	PCBs, total Conc.	Qual.	p,p-DDD Conc.	Qual.
DAC-HY-01	01C	0.680	U	4.40		2.20		0.620		6.80		94.0		2.00	
DAC-HY-02	02C	0.670	U	20.0		4.10		2.00		20.0		330		5.20	
DAC-HY-03	03C	1.80		11.0		3.20		1.30		12.0		180		3.50	
DAC-HY-04	04C	1.60		12.0		3.30		1.30		11.0		220		3.80	
DAC-HY-05	05C	2.40		20.0		4.60		1.80		17.0		350		3.70	
DAC-HY-06	06C	0.940	U	31.0		5.80		3.40		44.0		510		7.40	
DAC-HY-07	07C	2.40		19.0		6.70		1.60		13.0		280		1.40	
DAC-HY-08	08C	0.067	U	42.0		9.20		5.20		66.0		790		7.20	
DAC-HY-09	09C	0.840		13.0		2.20		0.910		8.10		230		3.90	
DAC-HY-10	10C	1.20		28.0		3.00		0.620		11.0		470		7.40	
DAC-HY-11	11C	1.70		27.0		6.30		2.10		18.0		390		6.50	
DAC-HY-12	12C	2.20		27.0		6.50		2.00		16.0		400		7.80	
DAC-HY-13	13C	0.210		11.0		4.60		1.00		6.00		150		3.00	
DAC-HY-14	14C	1.10		16.0		6.70		1.40		8.30		230		3.90	
DAC-HY-15	15C	2.30		28.0		14.0		2.40		15.0		410		6.70	
DAC-HY-16	16C	6.20		29.0		12.0		2.00		15.0		600		13.0	
DAC-HY-17	17C	1.30		15.0		3.50		0.950		7.00		650		5.90	
DAC-HY-18	18C	3.00		27.0		7.40		1.60		11.0		580		7.60	
DAC-HY-19	19C	3.20		29.0		7.40		1.70		12.0		670		14.0	
DAC-HY-20	20C	2.70		24.0		10.0		1.70		13.0		600		15.0	
DAC-HY-21	21C	3.10		37.0		7.70		2.10		12.0		600		14.0	
DAC-HY-22	22C	2.50		17.0		5.00		1.10		7.00		410		7.10	
DAC-HY-23	23C	4.90		17.0		7.10		1.00		7.40		530		11.0	
DAC-HY-24	24C	5.60		16.0		6.80		1.20		8.20		470		16.0	
DAC-HY-25	25C	5.30		17.0		5.90		1.70		8.70		510		2.50	
DAC-HY-26	26C	5.00		15.0		5.80		1.80		7.50		450		2.60	
DAC-HY-27	27C	3.30		11.0		5.30		2.90		5.30		370		1.70	
DAC-HY-28	28C	4.30		11.0		5.90		3.40	J	6.40		350		21.0	
DAC-CR-02	02C-REF	0.460	U	0.160		0.066	U	0.050	U	0.110		6.00		0.140	
DAC-CR-02A	02AC-REF	0.130	U	0.210		0.100		0.059	U	0.079		8.00		0.180	
DAC-HY-30	30C-REF	1.20		2.20		2.00		0.320		2.30		64.0		1.30	
DAC-HY-35	35C-REF	0.930	U	1.70		1.10		0.087	U	0.710		63.0		1.70	
DAC-HY-05	05CCB	0.071	U	0.072	U	0.088	U	0.071	U	0.072	U	11		0.093	U
DAC-HY-22	22FB	0.052	U	0.130		0.065	U	0.049	U	0.330		5		0.098	U

Concentrations of Semivolatile Organic Compounds in Surface Sediments of the Hylebos Waterway and Reference Stations (ug/kg DW) (Continued)

		p,p-DDE		p,p-DDT	
Station	Sample	Conc.	Qual.	Conc.	Qual.
DAC-HY-01	01C	0.220		0.074	U
DAC-HY-02	02C	0.490		6.50	
DAC-HY-03	03C	0.100		0.860	
DAC-HY-04	04C	0.830		1.50	
DAC-HY-05	05C	0.540		0.360	
DAC-HY-06	06C	0.840		2.70	
DAC-HY-07	07C	0.038	U	0.055	U
DAC-HY-08	08C	0.180		0.072	U
DAC-HY-09	09C	0.470		0.520	
DAC-HY-10	10C	0.640		2.70	
DAC-HY-11	11C	1.20		2.20	
DAC-HY-12	12C	1.80		2.90	
DAC-HY-13	13C	2.10		0.280	
DAC-HY-14	14C	1.10		0.960	
DAC-HY-15	15C	1.80		5.70	
DAC-HY-16	16C	3.10		2.90	
DAC-HY-17	17C	4.50		1.60	
DAC-HY-18	18C	4.10		5.10	
DAC-HY-19	19C	6.30		5.40	
DAC-HY-20	20C	3.90		7.30	
DAC-HY-21	21C	4.10		19.0	
DAC-HY-22	22C	2.70		2.10	
DAC-HY-23	23C	3.80		3.50	
DAC-HY-24	24C	6.90		2.50	
DAC-HY-25	25C	9.60		2.80	
DAC-HY-26	26C	13.0		2.40	
DAC-HY-27	27C	8.90		2.20	
DAC-HY-28	28C	12.0		1.90	J
DAC-CR-02	02C-REF	0.110		0.057	U
DAC-CR-02A	02AC-REF	0.210		0.140	U
DAC-HY-30	30C-REF	0.380		0.210	
DAC-HY-35	35C-REF	0.190		0.200	
DAC-HY-05	05CCB	0.059	U	0.086	U
DAC-HY-22	22FB	0.052	U	0.056	U

Concentrations of Volatile Organic Compounds in Surface Sediments of the Hylebos Waterway and Reference Stations (ug/kg DW)

		Trichloroethene		Tetrachloroethene		Ethylbenzene		Xylenes		1,2-Dichlorobenzene		1,2,4-Trichlorobenzene		1,3-Dichlorobenzene		1,4-Dichlorobenzene	
Station	Sample	Conc.	Qual.	Conc.	Qual	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.
DAC-HY-01	01C	1.40	U	1.40	U	1.40	U	2.90	U	1.40	U	7.10	U	1.40	U	1.40	U
DAC-HY-02	02C	1.40	U	1.40	U	1.40	U	2.80	U	1.40	U	6.90	U	1.40	U	1.40	U
DAC-HY-03	03C	1.60	U	1.60	U	1.60	U	3.30	U	1.60	U	8.20	U	1.60	U	1.60	U
DAC-HY-04	04C	1.40	U	1.40	U	1.40	U	2.90	U	1.40	U	7.20	U	1.40	U	1.40	U
DAC-HY-05	05C	1.20	U	1.20	U	1.20	U	2.50	U	1.20	U	6.20	U	1.20	U	1.20	U
DAC-HY-06	06C	1.40	U	1.40	U	1.40	U	2.80	U	1.40	U	7.00	U	1.40	U	1.40	U
DAC-HY-07	07C	2.40		1.40	U	1.40	U	2.70	U	1.40	U	6.80	U	1.40	U	1.40	U
DAC-HY-08	08C	1.60	U	1.60	U	1.60	U	3.10	U	1.60	U	7.80	U	1.60	U	1.60	U
DAC-HY-09	09C	1.00	U	1.00	U	1.00	U	2.00	U	1.00	U	5.00	U	1.00	U	1.00	U
DAC-HY-10	10C	1.80	U	1.80	U	1.80	U	3.60	U	1.80	U	9.00	U	1.80	U	1.80	U
DAC-HY-11	11C	1.60	U	1.60	U	1.60	U	3.20	U	1.60	U	8.00	U	1.60	U	1.60	U
DAC-HY-12	12C	1.50	U	1.50	U	1.50	U	3.10	U	1.50	U	7.70	U	1.50	U	1.50	U
DAC-HY-13	13C	1.60	U	1.60	U	1.60	U	3.20	U	1.60	U	8.10	U	1.60	U	1.60	U
DAC-HY-14	14C	1.20	U	1.20	U	1.20	U	2.50	U	1.20	U	6.20	U	1.20	U	1.20	U
DAC-HY-15	15C	1.90	U	1.90	U	1.90	U	3.70	U	1.90	U	9.30	U	1.90	U	1.90	U
DAC-HY-16	16C	2.20	U	2.20	U	2.20	U	4.50	U	2.20	U	11.0	U	2.20	U	2.20	U
DAC-HY-17	17C	1.40	U	1.40	U	1.40	U	2.80	U	1.40	U	7.00	U	1.40	U	1.40	U
DAC-HY-18	18C	1.80	U	1.80	U	1.80	U	3.50	U	1.80	U	8.90	U	1.80	U	1.80	U
DAC-HY-19	19C	1.00	U	1.00	U	1.00	U	2.00	U	1.00	U	5.00	U	1.00	U	1.00	U
DAC-HY-20	20C	2.10	U	2.10	U	2.10	U	4.30	U	2.10	U	11.0	U	2.10	U	2.10	U
DAC-HY-21	21C	1.00	U	1.00	U	1.00	U	2.00	U	1.00	U	5.00	U	1.00	U	1.00	U
DAC-HY-22	22C	1.70	U	1.70	U	1.70	U	3.40	U	1.70	U	8.50	U	1.70	U	1.70	U
DAC-HY-23	23C	1.70	U	1.70	U	1.70	U	3.40	U	1.70	U	8.50	U	1.70	U	1.70	U
DAC-HY-24	24C	2.30	U	2.30	U	2.30	U	4.70	U	2.30	U	12.0	U	2.30	U	2.30	U
DAC-HY-25	25C	2.00	U	2.00	U	2.00	U	4.00	U	2.00	U	9.90	U	2.00	U	2.00	U
DAC-HY-26	26C	2.30	U	2.30	U	2.30	U	4.60	U	2.30	U	12.0	U	2.30	U	2.30	U
DAC-HY-27	27C	1.90	U	1.90	U	1.90	U	3.80	U	1.90	U	9.50	U	1.90	U	1.90	U
DAC-HY-28	28C	2.30	U	2.30	U	2.30	U	4.60	U	2.30	U	11.0	U	2.30	U	2.30	U
DAC-CR-02	02C-REF	1.20	U	1.20	U	1.20	U	2.40	U	1.20	U	6.10	U	1.20	U	1.20	U
DAC-CR-02A	02AC-REF	1.00	U	1.00	U	1.00	U	2.00	U	1.00	U	5.00	U	1.00	U	1.00	U
DAc-HY-30	30C-REF	1.70	U	1.70	U	1.70	U	3.30	U	1.70	U	8.30	U	1.70	U	1.70	U
DAC-HY-35	35C-REF	1.60	U	1.60	U	1.60	U	3.20	U	1.60	U	8.00	U	1.60	U	1.60	U
DAC-HY-30	30C-VB	1.00	U	1.00	U	1.00	U	2.00	U	1.00	U	5.00	U	1.00	U	1.00	U

Concentrations of Semi-Volatile Organic Compounds in Surface Sediments of Hylebos Waterway and Reference Stations (Organic Carbon Normalized)

		2-Methylnaphthalene		Acenaphthene		Acenaphthylene		Anthracene		Fluorene		Total low molecular weight PAHs		Naphthalene		Phenanthrene	
Station	Sample	Conc.	Qual.	Conc.	Qual.	Conc.	Qua.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.
DAC-HY-01	01C	3800		1130		653		4730		2070		24800		5530		10700	
DAC-HY-02	02C	3390		2560		1060		7220		3560		43800		7220		22200	
DAC-HY-03	03C	7810	J	9900		1150		38500	J	16100	J	150000	J	11500		72900	J
DAC-HY-04	04C	4970		3490		1140		9710		4060		51500		9140		24000	
DAC-HY-05	05C	5080		2590		1270		40600		9640		105000		8630		42100	
DAC-HY-06	06C	6740		5700		984		14000		7770		76100		13500		34200	
DAC-HY-07	07C	7430		3660		1200		29700		6290		83700		11400		31400	
DAC-HY-08	08C	6600		2990		1630		10800		4860		53200		10400		22600	
DAC-HY-09	09C	5940		3120		941		14900		5450		67400		14900		28200	
DAC-HY-10	10C	5390		4260		1270		16200		6860		79100		11800		38700	
DAC-HY-11	11C	3570		1810		1000		7620		2860		36800		7140		16200	
DAC-HY-12	12C	4000		2480		1200		10000		3880		46000		9200		19200	
DAC-HY-13	13C	5290		3230		1220		6350		3600		45600		16900		14300	
DAC-HY-14	14C	4420		2310		1500		7480		3200		43700		11600		17700	
DAC-HY-15	15C	3450		2200		1250		11400		3800		47600		7840		21200	
DAC-HY-16	16C	2310		1410		737		5130	J	2120	J	29300	J	4810		15100	
DAC-HY-17	17C	921		482		232		2630		789		10900		2370		4390	
DAC-HY-18	18C	2170		1220		623		7120		2170		29200		3860		14200	
DAC-HY-19	19C	2160		3640		675		11700		3900		52600		4160		28600	
DAC-HY-20	20C	1680		1090		495		6680		1760		26600		3470		13100	
DAC-HY-21	21C	1840		1450		638		7650		2120		29500		3320		14300	
DAC-HY-22	22C	1460		1310		405		13400		2150		82400		2830		62300	
DAC-HY-23	23C	1350		1110		423		6610		1750		25500		2650		13000	
DAC-HY-24	24C	1010		1040		291		16900		2910		36000		1470		13300	
DAC-HY-25	25C	839		633		348		4270		1080		15100	J	1340		7440	J
DAC-HY-26	26C	691		461		362		2800		987		12000		1280		6090	J
DAC-HY-27	27C	878		612		372		3460		1040		14100	J	1460		7180	J
DAC-HY-28	28C	1160		711		406		4880		1420		17100	J	1340		8330	J
DAC-CR-02	02C-REF	71.4	U	83.6	U	48.9	U	42.8	U	67.3	U	671	<	133		296	
DAC-CR-02A	02AC-REF	311		257	U	149	U	189		203	U	2280	<	541		946	
DAC-HY-30	30C-REF	2810		2730		496		7850		3390		41100	J	3880		22700	J
DAC-HY-35	35C-REF	5790		5850		1350		13500		6430		85000		9940		48000	

Concentrations of Semi-Volatile Organic Compounds in Surface Sediments of Hylebos Waterway and Reference Stations (Organic Carbon Normalized) (Continued)

		Dibenz(a,h)anthracene		Benz(a)anthracene		Benzo(a)pyrene		Benzo(g,h,i)perylene		Chrysene		Fluoranthene		Total high molecular weight PAHs	
Station	Sample	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.
DAC-HY-01	01C	1000		6530		6130		4330		9330		16000		84700	
DAC-HY-02	02C	2110		11100		12800		8890		16100		31700		165000	
DAC-HY-03	03C	5730		51600		41700		21400		62500		125000	J	529000	J
DAC-HY-04	04C	2910		19400		19400		11400		27400		51400		250000	
DAC-HY-05	05C	2840		28400		19800		11200		41100		81200		312000	
DAC-HY-06	06C	3160		21800		21200		13000		31600		50300		269000	
DAC-HY-07	07C	3140		29700		22900		12600		38900		68600		316000	
DAC-HY-08	08C	2780		18400		18100		14200		38200		38200		250000	
DAC-HY-09	09C	3320		25700		20800		12400		37600		69300		300000	
DAC-HY-10	10C	4510		34800		30400		17600		53900		93100		414000	
DAC-HY-11	11C	2710		16700		16700		11400		29000		39500		226000	
DAC-HY-12	12C	3760		23600		23600		14000		40000		44000		279000	
DAC-HY-13	13C	1270		9520		7940		5820		17500		29600		133000	
DAC-HY-14	14C	3060		16300		19000		12900		32000		40800		246000	
DAC-HY-15	15C	4310		20400		21600		17600		43100		47100		300000	
DAC-HY-16	16C	3530		12500		17600		14700		28200		31100		223000	
DAC-HY-17	17C	2110		5700		12700		10100		18900		13200		151000	
DAC-HY-18	18C	4150		15100		21400		18400		38600		41500		285000	
DAC-HY-19	19C	5190		22100		28600		24400		57100		57100		402000	
DAC-HY-20	20C	4700		18100		22500		21500		44600		44600		315000	
DAC-HY-21	21C	5360		17100		25500		22400		45900		43400		338000	
DAC-HY-22	22C	4670		19900		21800		18400		46700		90300		378000	
DAC-HY-23	23C	5560		20400		29100		23000		50300		42300		354000	
DAC-HY-24	24C	5810		32500		30800		22200		63200		104000		488000	
DAC-HY-25	25C	4430		11700		20600		15800		33200		31600	J	262000	J
DAC-HY-26	26C	3950		7730		16400		14300		24700		18100	J	204000	J
DAC-HY-27	27C	3990		8780		18400		14600		26100		29300	J	228000	J
DAC-HY-28	28C	3660		13600		17300		13000		32500		44700	J	241000	J
DAC-CR-02	02C-REF	73.4	U	58.1	U	56.1	U	69.3	U	214		622		1780	<
DAC-CR-02A	02AC-REF	149	U	473		473		662		865		2030		8390	<
DAC-HY-30	30C-REF	1780		9920		10700		7020		14000		27700	J	132000	J
DAC-HY-35	35C-REF	1990		19900		14600		8770		21600		45600		200000	

Concentrations of Semi-Volatile Organic Compounds in Surface Sediments of Hylebos Waterway and Reference Stations (Organic Carbon Normalized) (Continued)

		Indeno(1,2,3-c,d)pyrene		Pyrene		Total benzofluoranthenes		1,2-Dichlorobenzene		1,2,4-Trichlorobenzene		1,3-Dichlorobenzene		1,4-Dichlorobenzene	
Station	Sample	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.
DAC-HY-01	01C	4070		21300		16000		100		460		80.0		573	U
DAC-HY-02	02C	8890		42200		31100		228		1610		172		1060	
DAC-HY-03	03C	22900		99000	J	99000		286		833		115		3180	
DAC-HY-04	04C	11400		57100		49700		229		1260		171		2690	
DAC-HY-05	05C	11200		66000		50800		239		1570		198		1570	
DAC-HY-06	06C	13000		67400		48200		518		5030		570		4200	
DAC-HY-07	07C	13100		74300		53100		280		2570		297		1430	
DAC-HY-08	08C	12200		52100		55600		347		2570		382		1220	
DAC-HY-09	09C	12400		64400		54500		421		2920		485		1980	
DAC-HY-10	10C	18100		78400		83300		637		5390		686		2450	
DAC-HY-11	11C	10000		47600		52400		281		2000		300		1330	
DAC-HY-12	12C	14000		52000		64000		212		1400		212		1760	
DAC-HY-13	13C	4810		33300		23300		74.1		392		84.7	U	386	U
DAC-HY-14	14C	11600		53100		57100		163		1020		170	U	816	
DAC-HY-15	15C	16100		58800		70600		122		745		118		667	U
DAC-HY-16	16C	12800		44900		57700		119		705		131		641	
DAC-HY-17	17C	7890		41700		39000		87.7		614		101		250	U
DAC-HY-18	18C	15700		62300		68200		136		890		157		623	
DAC-HY-19	19C	20800		98700		88300		174		1040		182		571	
DAC-HY-20	20C	17800		59400		81700		89.1		619		99		421	U
DAC-HY-21	21C	19900		71400		86700		168		944		171		587	
DAC-HY-22	22C	16800		84100		74800		140		654		128		436	
DAC-HY-23	23C	19800		60800		103000		90.0		397		74.1		397	U
DAC-HY-24	24C	18800		97400		113000		51.3		205		51.3		274	U
DAC-HY-25	25C	14700		53800		75900		53.8		222		45.9		253	
DAC-HY-26	26C	13200		41100		64100		39.5		181		37.8		197	
DAC-HY-27	27C	13000		47900		66500		53.2		205		42.6		266	
DAC-HY-28	28C	12200		42700		61000		40.6		163		38.6		264	
DAC-CR-02	02C-REF	73.4	U	499		112		30.6	U	27.5	U	26.5	U	122	U
DAC-CR-02A	02AC-REF	500		1620		1620		54.0	U	43.2	U	51.4	U	243	U
DAC-HY-30	30C-REF	7440		31000		21900		66.1		103		41.3		413	
DAC-HY-35	35C-REF	8190		52000		26900		105		117		40.4		450	U

Concentrations of Semi-Volatile Organic Compounds in Surface Sediments of Hylebos Waterway and Reference Stations (Organic Carbon Normalized) (Continued)

Station	Sample	Hexachlorobutadiene Conc.	Qual.	Di-n-octyl phthalate Conc.	Qual.	Bis(2-ethylhexyl)phthalate Conc.	Qual.	Butylbenzyl phthalate Conc.	Qual.	Diethyl phthalate Conc.	Qual.	Dimethyl phthalate Conc.	Qual.	Di-n-butyl phthalate Conc.	Qual.	Hexachlorobenzene Conc.	Qual.
DAC-HY-01	01C	933		200		6270	J	800	J	220	UJ	160	J	4800	J	733	
DAC-HY-02	02C	2720		183		4940	J	483	UJ	156	UJ	128	J	344	UJ	1110	
DAC-HY-03	03C	1300		573		24500	J	1820	J	115	UJ	411	J	1560	UJ	1150	
DAC-HY-04	04C	2110		440		14300	J	1140	J	149	UJ	297	J	800	UJ	1260	
DAC-HY-05	05C	3810		269		27900	J	761	J	152	UJ	452	J	3860	J	2080	
DAC-HY-06	06C	7770		518		7250	J	503	J	130	UJ	249	J	321	UJ	3260	
DAC-HY-07	07C	14900		309		15400	J	503	UJ	149	UJ	800	J	743	UJ	3660	
DAC-HY-08	08C	8330		201		5560	J	451		146	U	181		326	U	1880	
DAC-HY-09	09C	10900		490		54500	J	1090		124	U	475		1490	U	5940	
DAC-HY-10	10C	5880		686		22500	J	2250		250	U	2300		1230	U	3140	
DAC-HY-11	11C	3140		367		14800	J	952		186	U	524		667	U	1900	
DAC-HY-12	12C	2480		440		13200	J	1440		180	U	480		440	U	1800	
DAC-HY-13	13C	847		143		5290	J	270	U	122	U	365		291	U	635	
DAC-HY-14	14C	1560		272		12200	J	1290		204	U	422		578	U	1090	
DAC-HY-15	15C	980		341		20400	J	2470		169	UJ	1290	J	824	UJ	1100	
DAC-HY-16	16C	801		122	J	18600	J	2980		196	U	1220		833	U	737	
DAC-HY-17	17C	386		83.3		3110	UJ	355	UJ	83.3	UJ	42.1	J	259	UJ	434	
DAC-HY-18	18C	712		243		16600	J	1990	J	97.9	UJ	950	J	593	UJ	623	
DAC-HY-19	19C	701		184		13000	J	1380	J	77.9	UJ	779	J	390	UJ	545	
DAC-HY-20	20C	470		188		18800	J	2970		101	UJ	1360	J	842	UJ	569	
DAC-HY-21	21C	612		148		19600	J	2090	J	163	UJ	1660	J	765	UJ	740	
DAC-HY-22	22C	530		246		18700	J	2180	J	16.2	UJ	592	J	748	UJ	374	
DAC-HY-23	23C	317		370		24300	J	15300		90.0	UJ	952	J	74	UJ	291	
DAC-HY-24	24C	205		205	J	23900	J	2560	J	142	UJ	1280	J	1350	UJ	205	
DAC-HY-25	25C	152		190		15800	J	1390		52.2	UJ	759		364	UJ	206	
DAC-HY-26	26C	109		105		15100	J	905		82.2	UJ	888		280	UJ	197	
DAC-HY-27	27C	152		346		31900	J	1780		55.8	UJ	1600		532	UJ	215	
DAC-HY-28	28C	138		224		24400	J	2030		36.6	UJ	1360		467	UJ	177	
DAC-CR-02	02C-REF	112	U	19.4	U	805	U	98.9	UJ	214	UJ	21.4	J	275	UJ	11.2	U
DAC-CR-02A	02AC-REF	203	U	47.3	U	2430	UJ	257	U	338	U	56.8	UJ	730	UJ	24.3	
DAC-HY-30	30C-REF	136		322		6200	J	537		132	UJ	826		455	UJ	190	
DAC-HY-35	35C-REF	187		105		5670	J	333	UJ	158	UJ	322	J	398	UJ	251	

Concentrations of Semi-Volatile Organic Compounds in Surface Sediments of Hylebos Waterway and Reference Stations (Organic Carbon Normalized) (Continued)

Station	Sample	Chlorobiphenyl 10/209 Conc.	Qual.	Chlorobiphenyl 3/18 Conc.	Qual.	Chlorobiphenyl 3/28 Conc.	Qual.	Chlorobiphenyl 4/44 Conc.	Qual.	Chlorobiphenyl 4/52 Conc.	Qual.	Chlorobiphenyl 4/66 Conc.	Qual.	Chlorobiphenyl 5/101 Conc.	Qual.
DAC-HY-01	01C	800		140		34.0	U	86.7	U	53.3		6.67	U	133	
DAC-HY-02	02C	1940		300		178		172	U	250		333		311	
DAC-HY-03	03C	1300		234		120	U	161	U	109		52.1	U	193	
DAC-HY-04	04C	857		326		166		171		177		229		286	
DAC-HY-05	05C	2030		315		173		178	U	157		203		401	
DAC-HY-06	06C	2950		301		321		332		363		622		321	
DAC-HY-07	07C	1660		686		326		251	U	177		400		177	
DAC-HY-08	08C	4860		382		312		347		177		347		240	
DAC-HY-09	09C	594		1090		193		129	U	178		446		84.2	
DAC-HY-10	10C	784		735		176		118	U	466		441		2.94	U
DAC-HY-11	11C	1190		471		114		224	U	200		238		257	
DAC-HY-12	12C	760		400		144		176	U	184		240		332	
DAC-HY-13	13C	317		180		46.6	U	84.7	U	143		106		254	
DAC-HY-14	14C	680		279		95.2		272	U	306		136		592	
DAC-HY-15	15C	863		149		86.3		271		349		3.92	U	706	
DAC-HY-16	16C	833		151		131		272		295		256		897	
DAC-HY-17	17C	417		281		180		430		1360		4.39	U	2190	
DAC-HY-18	18C	653		326		187		258	U	475		2.97	U	979	
DAC-HY-19	19C	494		364		247		312		519		156		1040	
DAC-HY-20	20C	470		146		124		248		396		2.48	U	965	
DAC-HY-21	21C	561		536		224		281		408		179		893	
DAC-HY-22	22C	343		268		190		224	U	343		3.12	U	748	
DAC-HY-23	23C	344		230		317		317		450		344		873	
DAC-HY-24	24C	159		101		145		188		239		6.84		547	
DAC-HY-25	25C	285		109		127		206		222		190		459	
DAC-HY-26	26C	280		67.4		90.5		214		247		164		428	
DAC-HY-27	27C	319		98.4		117		226	U	319		213		559	
DAC-HY-28	28C	203		81.3		97.6		167	U	224		142		386	
DAC-CR-02	02C-REF	5.61	U	19.4	U	18.4	U	54.0	U	18.4		8.15	U	20.4	U
DAC-CR-02A	02AC-REF	20.3		37.8	U	29.7		75.7	U	28.4		27.0		36.5	
DAC-HY-30	30C-REF	161		95.0		31.8	U	82.6	U	86.8		8.26	U	103	
DAC-HY-35	35C-REF	87.7		152		57.3	U	70.2	U	99.4		5.85	U	170	

Concentrations of Semi-Volatile Organic Compounds in Surface Sediments of Hylebos Waterway and Reference Stations (Organic Carbon Normalized) (Continued)

		Chlorobiphenyl 5/105		Chlorobiphenyl 5/118		Chlorobiphenyl 6/128		Chlorobiphenyl 6/138		Chlorobiphenyl 6/153		Chlorobiphenyl 7/170		Chlorobiphenyl 7/180	
Station	Sample	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.
DAC-HY-01	01C	66.7		360		39.3		193		233		45.3	U	293	
DAC-HY-02	02C	322		1720		83.3		667		439		37.2	U	1110	
DAC-HY-03	03C	83.3		120		62.5		307		323		93.8		573	
DAC-HY-04	04C	286		1260		80.0		383		406		91.4		686	
DAC-HY-05	05C	188		1320		188		609		761		122		1020	
DAC-HY-06	06C	383		2120		2.49	U	570		451		48.7	U	1610	
DAC-HY-07	07C	371		1140		2.40	U	480		4.00	U	137		1090	
DAC-HY-08	08C	163		1740		2.33	U	319		521		2.33	U	1460	
DAC-HY-09	09C	163		1240		1.53	U	282		144		41.6		644	
DAC-HY-10	10C	461		2650		167		637		2700		58.8		1370	
DAC-HY-11	11C	367		2240		36.2		667		619	J	81.0		1290	
DAC-HY-12	12C	320		1800		156		760		560		88.0		1080	
DAC-HY-13	13C	148		688		68.8		323		487		11.1		582	
DAC-HY-14	14C	320		510		224		952		1020		74.8		1090	
DAC-HY-15	15C	2.94	U	941		212		1100		941		90.2		1100	
DAC-HY-16	16C	353		897		276		1190		1960	J	199		929	
DAC-HY-17	17C	877		2760		439		2020		2060		57.0		658	
DAC-HY-18	18C	386		1040		237		1280		1280		89.0		801	
DAC-HY-19	19C	416		1040		286		1250		1250		83.1		753	
DAC-HY-20	20C	1.83	U	1240		297		1290		990		66.8		594	
DAC-HY-21	21C	689		1150		1.79	U	1150		3.06	U	79.1		944	
DAC-HY-22	22C	274		1030		218		810		935		77.9		530	
DAC-HY-23	23C	2.25	U	926		262		1140		847		130		450	
DAC-HY-24	24C	1.88	U	615		118		667		564		95.7		274	
DAC-HY-25	25C	146		411		106		554		601		83.9		269	
DAC-HY-26	26C	130		312		93.8		526		592		82.2		247	
DAC-HY-27	27C	181		638		136		665		745		87.8		293	
DAC-HY-28	28C	142		305		95.5		488		528		87.4		224	
DAC-CR-02	02C-REF	16.3		25.5		7.85		34.7	U	31.6	U	46.9	U	16.3	
DAC-CR-02A	02AC-REF	10.1	U	52.7		9.59	U	68.9	U	51.4		17.6	U	23.4	
DAC-HY-30	30C-REF	21.5		112		29.3		116		128		49.6		90.9	
DAC-HY-35	35C-REF	76.0		298		29.2		240		316		54.4	U	99.4	

Concentrations of Semi-Volatile Organic Compounds in Surface Sediments of Hylebos Waterway and Reference Stations (Organic Carbon Normalized) (Continued)

Station	Sample	Chlorobiphenyl 7/187 Conc.	Qual.	Chlorobiphenyl 8/195 Conc.	Qual.	Chlorobiphenyl 9/206 Conc.	Qual.	PCBs, total Conc.	Qual.
DAC-HY-01	01C	147		41.3		453		6270	
DAC-HY-02	02C	228		111		1110		18300	
DAC-HY-03	03C	167		67.7		625		9380	
DAC-HY-04	04C	189		74.3		629		12600	
DAC-HY-05	05C	234		91.4		863		17800	
DAC-HY-06	06C	301		176		2280		26400	
DAC-HY-07	07C	383		91.4		743		16000	
DAC-HY-08	08C	319		181		2290		27400	
DAC-HY-09	09C	109		45.0		401		11400	
DAC-HY-10	10C	147		30.4		539		23000	
DAC-HY-11	11C	300		100		857		18600	
DAC-HY-12	12C	260		80.0		640		16000	
DAC-HY-13	13C	243		52.9		317		7940	
DAC-HY-14	14C	456		95.2		565		15600	
DAC-HY-15	15C	549		94.1		568		16100	
DAC-HY-16	16C	385		64.1		481		19200	
DAC-HY-17	17C	154		41.7		307		28500	
DAC-HY-18	18C	220		47.5		326		17200	
DAC-HY-19	19C	192		44.2		312		17400	
DAC-HY-20	20C	248		42.1		322		14900	
DAC-HY-21	21C	196		53.6		306		15300	
DAC-HY-22	22C	156		34.3		218		12800	
DAC-HY-23	23C	188		26.5		196		14000	
DAC-HY-24	24C	116		20.5		140		8030	
DAC-HY-25	25C	93.4		26.9		138		8070	
DAC-HY-26	26C	95.4		29.6		123		7400	
DAC-HY-27	27C	141		77.1		141		9840	
DAC-HY-28	28C	120		69.1	J	130		7110	
DAC-CR-02	02C-REF	6.73	U	5.10	U	11.2		612	
DAC-CR-02A	02AC-REF	13.5		7.97	U	10.7		1080	
DAC-HY-30	30C-REF	82.6		13.2		95.0		2640	
DAC-HY-35	35C-REF	64.3		5.09	U	41.5		3680	

Concentrations of Volatile Organic Compounds in Surface Sediments of Hylebos Waterway and Reference Stations (Organic Carbon Normalized)

		Trichloroethene		Tetrachloroethene		Ethylbenzene		Xylenes		1,2-Dichlorobenzene		1,2,4-Trichlorobenzene		1,3-Dichlorobenzene		1,4-Dichlorobenzene	
Station	Sample	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.
DAC-HY-01	01C	93.3	U	93.3	U	93.3	U	193	U	93.3	U	473	U	93.3	U	93.3	U
DAC-HY-02	02C	77.8	U	77.8	U	77.8	U	156	U	77.8	U	383	U	77.8	U	77.8	U
DAC-HY-03	03C	83.3	U	83.3	U	83.3	U	172	U	83.3	U	427	U	83.3	U	83.3	U
DAC-HY-04	04C	80.0	U	80.0	U	80.0	U	166	U	80.0	U	411	U	80.0	U	80.0	U
DAC-HY-05	05C	60.9	U	60.9	U	60.9	U	127	U	60.9	U	315	U	60.9	U	60.9	U
DAC-HY-06	06C	72.5	U	72.5	U	72.5	U	145	U	72.5	U	363	U	72.5	U	72.5	U
DAC-HY-07	07C	137		80.0	U	80.0	U	154	U	80.0	U	389	U	80.0	U	80.0	U
DAC-HY-08	08C	55.6	U	55.6	U	55.6	U	108	U	55.6	U	271	U	55.6	U	55.6	U
DAC-HY-09	09C	49.5	U	49.5	U	49.5	U	99.0	U	49.5	U	248	U	49.5	U	49.5	U
DAC-HY-10	10C	88.2	U	88.2	U	88.2	U	176	U	88.2	U	441	U	88.2	U	88.2	U
DAC-HY-11	11C	76.2	U	76.2	U	76.2	U	152	U	76.2	U	381	U	76.2	U	76.2	U
DAC-HY-12	12C	60.0	U	60.0	U	60.0	U	124	U	60.0	U	308	U	60.0	U	60.0	U
DAC-HY-13	13C	84.7	U	84.7	U	84.7	U	169	U	84.7	U	429	U	84.7	U	84.7	U
DAC-HY-14	14C	81.6	U	81.6	U	81.6	U	170	U	81.6	U	422	U	81.6	U	81.6	U
DAC-HY-15	15C	74.5	U	74.5	U	74.5	U	145	U	74.5	U	365	U	74.5	U	74.5	U
DAC-HY-16	16C	70.5	U	70.5	U	70.5	U	144	U	70.5	U	353	U	70.5	U	70.5	U
DAC-HY-17	17C	61.4	U	61.4	U	61.4	U	123	U	61.4	U	307	U	61.4	U	61.4	U
DAC-HY-18	18C	53.4	U	53.4	U	53.4	U	104	U	53.4	U	264	U	53.4	U	53.4	U
DAC-HY-19	19C	26.0	U	26.0	U	26.0	U	52.0	U	26.0	U	130	U	26.0	U	26.0	U
DAC-HY-20	20C	52.0	U	52.0	U	52.0	U	106	U	52.0	U	272	U	52.0	U	52.0	U
DAC-HY-21	21C	25.5	U	25.5	U	25.5	U	51.0	U	25.5	U	128	U	25.5	U	25.5	U
DAC-HY-22	22C	53.0	U	53.0	U	53.0	U	106	U	53.0	U	265	U	53.0	U	53.0	U
DAC-HY-23	23C	45.0	U	45.0	U	45.0	U	90.0	U	45.0	U	225	U	45.0	U	45.0	U
DAC-HY-24	24C	39.3	U	39.3	U	39.3	U	80.3	U	39.3	U	205	U	39.3	U	39.3	U
DAC-HY-25	25C	31.6	U	31.6	U	31.6	U	63.3	U	31.6	U	157	U	31.6	U	31.6	U
DAC-HY-26	26C	37.8	U	37.8	U	37.8	U	75.7	U	37.8	U	197	U	37.8	U	37.8	U
DAC-HY-27	27C	50.5	U	50.5	U	50.5	U	101	U	50.5	U	253	U	50.5	U	50.5	U
DAC-HY-28	28C	46.8	U	46.8	U	46.8	U	93.5	U	46.8	U	224	U	46.8	U	46.8	U
DAC-CR-02	02C-REF	122	U	122	U	122	U	245	U	122	U	622	U	122	U	122	U
DAC-CR-02A	02AC-REF	135	U	135	U	135	U	270	U	135	U	676	U	135	U	135	U
DAC-HY-30	30C-REF	70.2	U	70.2	U	70.2	U	136	U	70.2	U	343	U	70.2	U	70.2	U
DAC-HY-35	35C-REF	93.6	U	93.6	U	93.6	U	187	U	93.6	U	468	U	93.6	U	93.6	U

Ratio of metal concentrations as analyzed by total digestion and strong acid digestion methods

Station	Sample	Variable	Method	Value	Qualifier	Method	Value	Qualifier	TD/SA ratio
CR-02	02C-REF	ANTIMONY	TD	1.22	U	SA	0.995	U	1.23
CR-02A	02AC-REF	ANTIMONY	TD	1.22	U	SA	0.995	U	1.23
HY-01	01C	ANTIMONY	TD	1.73		SA	0.995	U	1.74
HY-02	02C	ANTIMONY	TD	5.81		SA	0.995	U	5.84
HY-03	03C	ANTIMONY	TD	3.4		SA	0.995	U	3.42
HY-04	04C	ANTIMONY	TD	4.4		SA	0.995	U	4.42
HY-05	05C	ANTIMONY	TD	3.1		SA	0.995	U	3.12
HY-06	06C	ANTIMONY	TD	3.05		SA	0.995	U	3.07
HY-07	07C	ANTIMONY	TD	2.15		SA	0.995	U	2.16
HY-08	08C	ANTIMONY	TD	3.44		SA	0.995	U	3.46
HY-09	09C	ANTIMONY	TD	2.87		SA	0.995	U	2.88
HY-10	10C	ANTIMONY	TD	4.59		SA	0.995	U	4.61
HY-11	11C	ANTIMONY	TD	3.28		SA	0.995	U	3.3
HY-12	12C	ANTIMONY	TD	3.84		SA	0.995	U	3.86
HY-13	13C	ANTIMONY	TD	3.69		SA	0.995	U	3.71
HY-14	14C	ANTIMONY	TD	15.2		SA	1.12		13.57
HY-15	15C	ANTIMONY	TD	10.9		SA	0.995	U	10.95
HY-16	16C	ANTIMONY	TD	7.88		SA	0.995	U	7.92
HY-17	17C	ANTIMONY	TD	4.57		SA	2.07		2.21
HY-18	18C	ANTIMONY	TD	10.4		SA	1.46		7.12
HY-19	19C	ANTIMONY	TD	14.1		SA	1.45		9.72
HY-20	20C	ANTIMONY	TD	10.6		SA	0.995	U	10.65
HY-21	21C	ANTIMONY	TD	16.5		SA	1.17		14.1
HY-22	22C	ANTIMONY	TD	7.13		SA	1.12		6.37
HY-23	23C	ANTIMONY	TD	16.5		SA	1.36		12.13
HY-24	24C	ANTIMONY	TD	11.6		SA	1.83		6.34
HY-25	25C	ANTIMONY	TD	13.8		SA	2.27		6.08
HY-26	26C	ANTIMONY	TD	14.5		SA	1.54		9.42
HY-27	27C	ANTIMONY	TD	6.77		SA	0.995	U	6.8
HY-28	28C	ANTIMONY	TD	8.59		SA	0.995	U	8.63
HY-30	30C-REF	ANTIMONY	TD	1.22	U	SA	0.995	U	1.23
								Average:	5.85
CR-02	02C-REF	ARSENIC	TD	3.06		SA	13	U	0.24
CR-02A	02AC-REF	ARSENIC	TD	1.87		SA	13	U	0.14
HY-01	01C	ARSENIC	TD	5.45		SA	13	U	0.42
HY-02	02C	ARSENIC	TD	15.2		SA	16.6		0.92
HY-03	03C	ARSENIC	TD	12.9		SA	14.2		0.91
HY-04	04C	ARSENIC	TD	10.7		SA	13	U	0.82
HY-05	05C	ARSENIC	TD	12.2		SA	13	U	0.94
HY-06	06C	ARSENIC	TD	15		SA	20.7		0.72
HY-07	07C	ARSENIC	TD	10.8		SA	13	U	0.83
HY-08	08C	ARSENIC	TD	17.3		SA	27.6		0.63
HY-09	09C	ARSENIC	TD	11.3		SA	18.6		0.61
HY-10	10C	ARSENIC	TD	8.64		SA	13	U	0.66
HY-11	11C	ARSENIC	TD	15.8		SA	13.9		1.14

Ratio of metal concentrations as analyzed by total digestion and strong acid digestion methods (continued)

Station	Sample	Variable	Method	Value	Qualifier	Method	Value	Qualifier	TD/SA ratio
HY-12	12C	ARSENIC	TD	16		SA	21.4		0.75
HY-13	13C	ARSENIC	TD	7.88		SA	21.6		0.36
HY-14	14C	ARSENIC	TD	21.1		SA	14.9		1.42
HY-15	15C	ARSENIC	TD	15.8		SA	34.6		0.46
HY-16	16C	ARSENIC	TD	34.9		SA	34.6		1.01
HY-17	17C	ARSENIC	TD	9.92		SA	22.4		0.44
HY-18	18C	ARSENIC	TD	17.5		SA	41.1		0.43
HY-19	19C	ARSENIC	TD	40.1		SA	42		0.95
HY-20	20C	ARSENIC	TD	45.9		SA	48.9		0.94
HY-21	21C	ARSENIC	TD	32.2		SA	51.5		0.63
HY-22	22C	ARSENIC	TD	30.9		SA	47.2		0.65
HY-23	23C	ARSENIC	TD	22.9		SA	52.6		0.44
HY-24	24C	ARSENIC	TD	120		SA	54.5		2.2
HY-25	25C	ARSENIC	TD	61.4		SA	63.4		0.97
HY-26	26C	ARSENIC	TD	55.1		SA	54.5		1.01
HY-27	27C	ARSENIC	TD	97.6		SA	40.5		2.41
HY-28	28C	ARSENIC	TD	37		SA	38.4		0.96
HY-30	30C-REF	ARSENIC	TD	6.41		SA	13	U	0.49
								Average:	0.82
CR-02	02C-REF	CADMIUM	TD	0.348		SA	0.156		2.23
CR-02A	02AC-REF	CADMIUM	TD	0.18		SA	0.311		0.58
HY-01	01C	CADMIUM	TD	0.216	U	SA	0.184		1.17
HY-02	02C	CADMIUM	TD	0.303	U	SA	0.255		1.19
HY-03	03C	CADMIUM	TD	0.296	U	SA	0.261		1.13
HY-04	04C	CADMIUM	TD	0.298	U	SA	0.281		1.06
HY-05	05C	CADMIUM	TD	0.301	U	SA	0.234		1.29
HY-06	06C	CADMIUM	TD	0.405	U	SA	0.331		1.22
HY-07	07C	CADMIUM	TD	0.323	U	SA	0.206		1.57
HY-08	08C	CADMIUM	TD	0.456		SA	0.4		1.14
HY-09	09C	CADMIUM	TD	0.318		SA	0.292		1.09
HY-10	10C	CADMIUM	TD	0.339		SA	0.343		0.99
HY-11	11C	CADMIUM	TD	0.382		SA	0.335		1.14
HY-12	12C	CADMIUM	TD	0.356		SA	0.308		1.16
HY-13	13C	CADMIUM	TD	0.241		SA	0.23		1.05
HY-14	14C	CADMIUM	TD	0.269		SA	0.236		1.14
HY-15	15C	CADMIUM	TD	0.383		SA	0.447		0.86
HY-16	16C	CADMIUM	TD	0.477		SA	0.56		0.85
HY-17	17C	CADMIUM	TD	0.202		SA	0.202		1
HY-18	18C	CADMIUM	TD	0.474		SA	0.618		0.77
HY-19	19C	CADMIUM	TD	0.529		SA	0.676		0.78
HY-20	20C	CADMIUM	TD	0.674		SA	0.762		0.88
HY-21	21C	CADMIUM	TD	0.703		SA	0.83		0.85
HY-22	22C	CADMIUM	TD	0.492		SA	0.685		0.72
HY-23	23C	CADMIUM	TD	1.07		SA	1.14		0.94
HY-24	24C	CADMIUM	TD	1.95		SA	1.18		1.65
HY-25	25C	CADMIUM	TD	1.36		SA	1.35		1.01
HY-26	26C	CADMIUM	TD	0.981		SA	1.05		0.93

Ratio of metal concentrations as analyzed by total digestion and strong acid digestion methods (continued)

Station	Sample	Variable	Method	Value	Qualifier	Method	Value	Qualifier	TD/SA ratio
HY-27	27C	CADMIUM	TD	0.633		SA	0.694		0.91
HY-28	28C	CADMIUM	TD	0.803		SA	1.5	U	0.54
HY-30	30C-REF	CADMIUM	TD	0.295		SA	0.207	U	1.43
								Average:	1.07
CR-02	02C-REF	CHROMIUM	TD	61.4		SA	25.8		2.38
CR-02A	02AC-REF	CHROMIUM	TD	45.8		SA	31.4		1.46
HY-01	01C	CHROMIUM	TD	29		SA	22.7		1.28
HY-02	02C	CHROMIUM	TD	31.5		SA	30.9		1.02
HY-03	03C	CHROMIUM	TD	31.6		SA	32.4		0.98
HY-04	04C	CHROMIUM	TD	31.4		SA	28		1.12
HY-05	05C	CHROMIUM	TD	31.2		SA	29.3		1.06
HY-06	06C	CHROMIUM	TD	31		SA	35.9		0.86
HY-07	07C	CHROMIUM	TD	29.1		SA	28.2		1.03
HY-08	08C	CHROMIUM	TD	30.5		SA	32.5		0.94
HY-09	09C	CHROMIUM	TD	30.5		SA	27.6		1.11
HY-10	10C	CHROMIUM	TD	91.7		SA	32.8		2.8
HY-11	11C	CHROMIUM	TD	29.2		SA	28.3		1.03
HY-12	12C	CHROMIUM	TD	28.7		SA	27.8		1.03
HY-13	13C	CHROMIUM	TD	29.2		SA	28.9		1.01
HY-14	14C	CHROMIUM	TD	35.2		SA	23.1		1.52
HY-15	15C	CHROMIUM	TD	35		SA	36.6		0.96
HY-16	16C	CHROMIUM	TD	37.1		SA	37.3		0.99
HY-17	17C	CHROMIUM	TD	28.7		SA	20.3		1.41
HY-18	18C	CHROMIUM	TD	34.8		SA	33.7		1.03
HY-19	19C	CHROMIUM	TD	33.6		SA	32.6		1.03
HY-20	20C	CHROMIUM	TD	36.2		SA	49.3		0.73
HY-21	21C	CHROMIUM	TD	39.3		SA	36.4		1.08
HY-22	22C	CHROMIUM	TD	34.4		SA	30.8		1.12
HY-23	23C	CHROMIUM	TD	39.8		SA	34.5		1.15
HY-24	24C	CHROMIUM	TD	39.4		SA	45.6		0.86
HY-25	25C	CHROMIUM	TD	40.7		SA	48.8		0.83
HY-26	26C	CHROMIUM	TD	40.4		SA	50.2		0.8
HY-27	27C	CHROMIUM	TD	38.7		SA	40.7		0.83
HY-28	28C	CHROMIUM	TD	38.8		SA	43.6		0.89
HY-30	30C-REF	CHROMIUM	TD	27.7		SA	28.3		0.98
								Average:	1.14
CR-02	02C-REF	COPPER	TD	16		SA	12.2		1.31
CR-02A	02AC-REF	COPPER	TD	9.8		SA	18.7		0.52
HY-01	01C	COPPER	TD	53.6		SA	48.5		1.11
HY-02	02C	COPPER	TD	90.7		SA	76.4		1.19
HY-03	03C	COPPER	TD	159		SA	152.2		1.04
HY-04	04C	COPPER	TD	121		SA	98		1.23
HY-05	05C	COPPER	TD	80.8		SA	80.2		1.01
HY-06	06C	COPPER	TD	79.1		SA	80.2		0.99
HY-07	07C	COPPER	TD	84.4		SA	76.1		1.11
HY-08	08C	COPPER	TD	94.7		SA	82.3		1.15

Ratio of metal concentrations as analyzed by total digestion and strong acid digestion methods (continued)

Station	Sample	Variable	Method	Value	Qualifier	Method	Value	Qualifier	TD/SA ratio
HY-09	09C	COPPER	TD	104		SA	84		1.24
HY-10	10C	COPPER	TD	113		SA	110.4		1.02
HY-11	11C	COPPER	TD	94.5		SA	83.7		1.13
HY-12	12C	COPPER	TD	103		SA	89.7		1.15
HY-13	13C	COPPER	TD	60.7		SA	59.2		1.03
HY-14	14C	COPPER	TD	77.6		SA	71.3		1.09
HY-15	15C	COPPER	TD	132		SA	114.6		1.15
HY-16	16C	COPPER	TD	136		SA	125.1		1.09
HY-17	17C	COPPER	TD	53.8		SA	43.4		1.24
HY-18	18C	COPPER	TD	130		SA	121.1		1.07
HY-19	19C	COPPER	TD	135		SA	119.7		1.13
HY-20	20C	COPPER	TD	160		SA	154.6		1.03
HY-21	21C	COPPER	TD	161		SA	146.6		1.1
HY-22	22C	COPPER	TD	101		SA	114.2		0.88
HY-23	23C	COPPER	TD	190		SA	165.5		1.15
HY-24	24C	COPPER	TD	154		SA	151.3		1.02
HY-25	25C	COPPER	TD	230		SA	183.9		1.25
HY-26	26C	COPPER	TD	183		SA	180.7		1.01
HY-27	27C	COPPER	TD	127		SA	114.7		1.11
HY-28	28C	COPPER	TD	141		SA	139.7		1.01
HY-30	30C-REF	COPPER	TD	71.4		SA	65.7		1.09
								Average:	1.09
CR-02	02C-REF	LEAD	TD	10.4		SA	4.02		2.59
CR-02A	02AC-REF	LEAD	TD	8.49		SA	6.09		1.39
HY-01	01C	LEAD	TD	23.4		SA	21.5		1.09
HY-02	02C	LEAD	TD	44.9		SA	58.9		0.76
HY-03	03C	LEAD	TD	50.3		SA	72.3		0.7
HY-04	04C	LEAD	TD	63		SA	47.4		1.33
HY-05	05C	LEAD	TD	40.8		SA	54		0.76
HY-06	06C	LEAD	TD	73.9		SA	68.6		1.08
HY-07	07C	LEAD	TD	56.4		SA	58.5		0.96
HY-08	08C	LEAD	TD	86.4		SA	82.5		1.05
HY-09	09C	LEAD	TD	64.2		SA	66.3		0.97
HY-10	10C	LEAD	TD	158		SA	176		0.9
HY-11	11C	LEAD	TD	59.6		SA	57.9		1.03
HY-12	12C	LEAD	TD	65.1		SA	68.5		0.95
HY-13	13C	LEAD	TD	30.7		SA	33		0.93
HY-14	14C	LEAD	TD	55.3		SA	40.7		1.36
HY-15	15C	LEAD	TD	89.3		SA	75.4		1.18
HY-16	16C	LEAD	TD	83.1		SA	64.4		1.29
HY-17	17C	LEAD	TD	207		SA	35.2		5.88
HY-18	18C	LEAD	TD	87.9		SA	72.3		1.22
HY-19	19C	LEAD	TD	95.5		SA	74.1		1.29
HY-20	20C	LEAD	TD	105		SA	90.8		1.16
HY-21	21C	LEAD	TD	103		SA	89.1		1.16
HY-22	22C	LEAD	TD	57		SA	68.9		0.83
HY-23	23C	LEAD	TD	105		SA	84.2		1.25

Ratio of metal concentrations as analyzed by total digestion and strong acid digestion methods (continued)

Station	Sample	Variable	Method	Value	Qualifier	Method	Value	Qualifier	TD/SA ratio
HY-24	24C	LEAD	TD	114		SA	77.9		1.46
HY-25	25C	LEAD	TD	122		SA	83.2		1.47
HY-26	26C	LEAD	TD	129		SA	91		1.42
HY-27	27C	LEAD	TD	64		SA	52.1		1.23
HY-28	28C	LEAD	TD	73.6		SA	65		1.13
HY-30	30C-REF	LEAD	TD	28.7		SA	27.3		1.05
								Average:	1.32
CR-02	02C-REF	MERCURY	TD	0.038	UJ	SA	0.084	UJ	0.45
CR-02A	02AC-REF	MERCURY	TD	0.024	UJ	SA	0.113	UJ	0.21
HY-01	01C	MERCURY	TD	0.082	UJ	SA	0.222	UJ	0.37
HY-02	02C	MERCURY	TD	0.221	UJ	SA	0.304	UJ	0.73
HY-03	03C	MERCURY	TD	0.16		SA	0.387	UJ	0.41
HY-04	04C	MERCURY	TD	0.195	UJ	SA	0.255	UJ	0.76
HY-05	05C	MERCURY	TD	0.2	UJ	SA	0.268	UJ	0.75
HY-06	06C	MERCURY	TD	0.281	UJ	SA	0.365	UJ	0.77
HY-07	07C	MERCURY	TD	0.209	UJ	SA	0.241	UJ	0.87
HY-08	08C	MERCURY	TD	0.303	UJ	SA	0.487	UJ	0.62
HY-09	09C	MERCURY	TD	0.206	UJ	SA	0.317	UJ	0.65
HY-10	10C	MERCURY	TD	0.239	UJ	SA	0.395	UJ	0.61
HY-11	11C	MERCURY	TD	0.25	U	SA	0.348	U	0.72
HY-12	12C	MERCURY	TD	0.248	UJ	SA	0.392	UJ	0.63
HY-13	13C	MERCURY	TD	0.116	UJ	SA	0.239	UJ	0.49
HY-14	14C	MERCURY	TD	0.152	UJ	SA	0.242	UJ	0.63
HY-15	15C	MERCURY	TD	0.358	UJ	SA	0.459	UJ	0.78
HY-16	16C	MERCURY	TD	0.393	UJ	SA	0.528	UJ	0.74
HY-17	17C	MERCURY	TD	0.174	UJ	SA	0.207	UJ	0.84
HY-18	18C	MERCURY	TD	0.366	UJ	SA	0.558	UJ	0.66
HY-19	19C	MERCURY	TD	2.7	UJ	SA	0.595	UJ	4.54
HY-20	20C	MERCURY	TD	0.569	UJ	SA	0.759	UJ	0.75
HY-21	21C	MERCURY	TD	0.774	UJ	SA	0.801	UJ	0.97
HY-22	22C	MERCURY	TD	0.357	UJ	SA	0.605	UJ	0.59
HY-23	23C	MERCURY	TD	0.414	UJ	SA	0.578	UJ	0.72
HY-24	24C	MERCURY	TD	2.73	UJ	SA	0.976	UJ	2.8
HY-25	25C	MERCURY	TD	0.631	UJ	SA	0.911	UJ	0.69
HY-26	26C	MERCURY	TD	0.715	UJ	SA	0.997	UJ	0.72
HY-27	27C	MERCURY	TD	0.396	UJ	SA	0.619	UJ	0.64
HY-28	28C	MERCURY	TD	0.501	UJ	SA	0.747	UJ	0.67
HY-30	30C-REF	MERCURY	TD	0.251	UJ	SA	0.386	UJ	0.65
								Average:	0.85
CR-02	02C-REF	NICKEL	TD	33.9		SA	20.4		1.66
CR-02A	02AC-REF	NICKEL	TD	27.5		SA	27.4		1
HY-01	01C	NICKEL	TD	24.8		SA	14.6		1.7
HY-02	02C	NICKEL	TD	28.8		SA	18		1.6
HY-03	03C	NICKEL	TD	28.6		SA	19.3		1.48
HY-04	04C	NICKEL	TD	28.3		SA	18.5		1.53
HY-05	05C	NICKEL	TD	27.7		SA	16.7		1.66

Ratio of metal concentrations as analyzed by total digestion and strong acid digestion methods (continued)

Station	Sample	Variable	Method	Value	Qualifier	Method	Value	Qualifier	TD/SA ratio
HY-06	06C	NICKEL	TD	35		SA	22.7		1.54
HY-07	07C	NICKEL	TD	30.7		SA	19.6		1.57
HY-08	08C	NICKEL	TD	36.4		SA	24.6		1.48
HY-09	09C	NICKEL	TD	29.9		SA	17.9		1.67
HY-10	10C	NICKEL	TD	32.8		SA	25.7		1.28
HY-11	11C	NICKEL	TD	30		SA	19.1		1.57
HY-12	12C	NICKEL	TD	30.2		SA	18.1		1.67
HY-13	13C	NICKEL	TD	27.1		SA	18.8		1.44
HY-14	14C	NICKEL	TD	28.2		SA	16.9		1.67
HY-15	15C	NICKEL	TD	32.1		SA	22.2		1.45
HY-16	16C	NICKEL	TD	37.5		SA	23.7		1.58
HY-17	17C	NICKEL	TD	29.5		SA	15.6		1.89
HY-18	18C	NICKEL	TD	34.4		SA	24.9		1.38
HY-19	19C	NICKEL	TD	36.7		SA	28.4		1.29
HY-20	20C	NICKEL	TD	40.3		SA	35.1		1.15
HY-21	21C	NICKEL	TD	43.7		SA	39.5		1.11
HY-22	22C	NICKEL	TD	35.9		SA	26.5		1.35
HY-23	23C	NICKEL	TD	39.8		SA	31.4		1.27
HY-24	24C	NICKEL	TD	38.2		SA	21.2		1.8
HY-25	25C	NICKEL	TD	39.4		SA	18		2.19
HY-26	26C	NICKEL	TD	41.2		SA	38.2		1.08
HY-27	27C	NICKEL	TD	36.4		SA	22.5		1.62
HY-28	28C	NICKEL	TD	38.8		SA	32.7		1.19
HY-30	30C-REF	NICKEL	TD	26.1		SA	20.3		1.29
								Average:	1.49
CR-02	02C-REF	SILVER	TD	0.076		SA	0.045		1.69
CR-02A	02AC-REF	SILVER	TD	0.043		SA	0.096		0.45
HY-01	01C	SILVER	TD	0.189		SA	0.269		0.7
HY-02	02C	SILVER	TD	0.229		SA	0.325		0.7
HY-03	03C	SILVER	TD	0.309		SA	0.429		0.72
HY-04	04C	SILVER	TD	0.259		SA	0.396		0.65
HY-05	05C	SILVER	TD	0.268		SA	0.416		0.64
HY-06	06C	SILVER	TD	0.264		SA	0.356		0.74
HY-07	07C	SILVER	TD	0.254		SA	0.315		0.81
HY-08	08C	SILVER	TD	0.295		SA	0.334		0.88
HY-09	09C	SILVER	TD	0.307		SA	0.399		0.77
HY-10	10C	SILVER	TD	0.328		SA	0.473		0.69
HY-11	11C	SILVER	TD	0.309		SA	0.391		0.79
HY-12	12C	SILVER	TD	0.306		SA	0.424		0.72
HY-13	13C	SILVER	TD	0.14		SA	0.198		0.71
HY-14	14C	SILVER	TD	0.173		SA	0.229		0.76
HY-15	15C	SILVER	TD	0.368		SA	0.465		0.79
HY-16	16C	SILVER	TD	0.363		SA	0.449		0.81
HY-17	17C	SILVER	TD	0.095		SA	0.112		0.85
HY-18	18C	SILVER	TD	0.325		SA	0.481		0.68
HY-19	19C	SILVER	TD	0.34		SA	0.438		0.78
HY-20	20C	SILVER	TD	0.37		SA	0.507		0.73

Ratio of metal concentrations prepared by total digestion and strong acid digestion methods (continued)

Station	Sample	Variable	Method	Value	Qualifier	Method	Value	Qualifier	TD/SA ratio
HY-22	22C	SILVER	TD	0.206		SA	0.341		0.6
HY-23	23C	SILVER	TD	0.288		SA	0.356		0.81
HY-24	24C	SILVER	TD	0.248		SA	0.352		0.7
HY-25	25C	SILVER	TD	0.289		SA	0.399		0.72
HY-26	26C	SILVER	TD	0.289		SA	0.46		0.63
HY-27	27C	SILVER	TD	0.202		SA	0.257		0.79
HY-28	28C	SILVER	TD	0.245		SA	0.438		0.56
HY-30	30C-REF	SILVER	TD	0.24		SA	0.371		0.65
								Average:	0.75
CR-02	02C-REF	ZINC	TD	17.2		SA	37.5		0.46
CR-02A	02AC-REF	ZINC	TD	15.7	U	SA	51.3		0.31
HY-01	01C	ZINC	TD	109		SA	63.4		1.72
HY-02	02C	ZINC	TD	135		SA	98.1		1.38
HY-03	03C	ZINC	TD	210		SA	142		1.48
HY-04	04C	ZINC	TD	176		SA	124		1.42
HY-05	05C	ZINC	TD	119		SA	97.7		1.22
HY-06	06C	ZINC	TD	142		SA	130		1.09
HY-07	07C	ZINC	TD	145		SA	103		1.41
HY-08	08C	ZINC	TD	135		SA	97.2		1.39
HY-09	09C	ZINC	TD	155		SA	109		1.42
HY-10	10C	ZINC	TD	161		SA	129		1.25
HY-11	11C	ZINC	TD	140		SA	97.4		1.44
HY-12	12C	ZINC	TD	113		SA	104		1.09
HY-13	13C	ZINC	TD	105		SA	71.4		1.47
HY-14	14C	ZINC	TD	144		SA	86.6		1.66
HY-15	15C	ZINC	TD	173		SA	132		1.31
HY-16	16C	ZINC	TD	579		SA	530		1.09
HY-17	17C	ZINC	TD	99.4		SA	95.5		1.04
HY-18	18C	ZINC	TD	213		SA	173		1.23
HY-19	19C	ZINC	TD	217		SA	169		1.28
HY-20	20C	ZINC	TD	261		SA	243		1.07
HY-21	21C	ZINC	TD	279		SA	221		1.26
HY-22	22C	ZINC	TD	196		SA	200		0.98
HY-23	23C	ZINC	TD	434		SA	380		1.14
HY-24	24C	ZINC	TD	295		SA	329		0.9
HY-25	25C	ZINC	TD	384		SA	376		1.02
HY-26	26C	ZINC	TD	324		SA	347		0.93
HY-27	27C	ZINC	TD	216		SA	210		1.03
HY-28	28C	ZINC	TD	250		SA	263		0.95
HY-30	30C-REF	ZINC	TD	75.5		SA	66.5		0.07
								Average:	1.17

APPENDIX D

LABORATORY BIOASSAY DATA SHEETS

Polychaete Benthic Abundance Data

ANNELIDA	NODC CODE	HY1I-1	HY1I-2	HY1I-3	HY1I-4	HY2I-1	HY2I-2	HY2I-3	HY2I-7	HY3I-1	HY3I-2
Amage anops	5001670101			1		1	1	1	2	4	4
Ampharete acutifrons	5001670208					7	1	2	1	1	1
Ampharete finmarchica	5001670214	5	1	8	3		2		5	3	3
Ampharete labrops	5001670215									2	1
Ampharete sp.	50016702										1
Ampharetidae	500107										
Amphicteis mucronata	5001670306							1			
Anobothrus gracilis	5001670701	1	1	5	1		1	1	2	1	
Aphelochaeta monilaris		2	3	14	2	2	4	1	5	18	24
Aphelochaeta sp. C	5001500302	254	223	242	196	489	163	238	299	303	405
Aphelochaeta spp.	50015009										
Arabellidae											
Aricidea lopezi											
Aricidea ramosa	5001410706										
Armandia brevis	5001580202										
Artacama coniferi	5001681101				1						
Artacamella hancocki	5001681201										
Asabellides lineata	5001670804	1		2		16	16	9	4	8	14
Asabellides sibirica								1			
Barantolla americana	5001600601							1			
Boccardia pugettensis	5001430812					1		1	2		
Boccardiella hamata	5001430806	85	29	114	182				1	4	
Capitella capitata	5001600101						1		1		1
Caulleriella sp. A											
Chaetozone acuta	5001500489		2	2				1			7
Chaetozone setosa	5001500401	1	1	4	5	1				3	5
Chaetozone sp.	50015004										
Chirimia similis											
Cirratulidae	500150							2			
Cirratulus cirratus	5001500101	1		1		1			3		3
Cirratulus sp.											
Clymenura columbiana	5001631206					1					
Cossura pygodactylata	5001520106										
Cossura sp.	50015201										
Demonax medius	5001700802										
Diopatra ornata	5001290202									1	
Dorvillea rudolphi											
Drilonereis falcata minor	500133010402		2								
Ehlersia heterochaeta	5001232201				1						
Eteone californica	5001130201					1					
Eteone longa	5001130205				1					1	
Eteone sp.	50011302										
Eteone spilotus											
Euchone incolor	5001700204	1		1			1				1
Euchone limnicola											
Euchone spp.											
Euclymene cf. zonalis	5001631103										
Euclymeninae	5001631		1		1						
Eudistylia catherinae											
Eulalia bilineata	5001130304										
Eulalia sanguinea	5001131101	1	6	2		1				2	1
Eusyllis habei	5001230699										
Exogone molesta	5001230704										
Galathowenia oculata	5001640202										
Glycera americana	5001270104	1									
Glycera nana	5001270129	3	3	3	2	4	1	2	3	1	
Glycera sp.	50012701										
Glycinde armigera	5001280103										1
Glycinde picta	5001280101			1		1					2
Glycinde polygnatha											
Goniada brunnea	5001280203	1	1			1	1	6	2	1	1
Goniada maculata	5001280202										
Gyptis brevipalpa	5001210102										
Harmothoe imbricata	5001020606										
Harmothoidae sp.											
Hesionidae	500121										
Heteromastus filobranchus	5001600203										
Heteromastus sp.	50016002										
Lanassa nordenskioeldi	5001681301	7	16	8	15	1	1	2	5	4	4
Lanassa venusta	500168130201				2						
Laonice cirrata	5001430201										
Laonice pugettensis	5001430204										
Laonice spp.					1						
Leitoscoloplos pugettensis	5001400302					2	8				1
Lepidasthenia berkeleyae	5001021										
Lepidasthenia longicirrata					1						
Lepidonotus squamatus	5001021703										1
Levinsenia gracilis	5001410801	1	2	2	1						
Lumbrineridae	500131	11	6	13	1	29	16	5	7	6	14
Lumbrineris californiensis	5001310132	1		1	3		1	3	4	1	7
Lumbrineris cruzensis	5001310118		2		1	1		1			
Magelona longicornis	5001440105	5	3	5	4	1	2	3	2	5	3
Magelona sp.	50014401										

ANNELIDA	NODC CODE	HY1I-1	HY1I-2	HY1I-3	HY1I-4	HY2I-1	HY2I-2	HY2I-3	HY2I-7	HY3I-1	HY3I-2
Maldane sarsi											
Maldanidae	500163		1	2	1						
Malmgreniella bansei										1	1
Mediomastus ambiseta	5001600401										
Mediomastus californiensis	5001600402				1					2	
Mediomastus sp.	50016004										
Melinna oculata			1		1						1
Mesochaetopterus taylori	5001490401	1		1	2	1	1	3	2	2	
Microphthalmus sczelkowii	5001210201										
Micropodarke dubia	5001210801										
Neoamphitrite edwardsi									1		
Neoamphitrite robusta	5001680401				1						
Nephtys caeca	5001250103										
Nephtys comuta	5001250104		1		1	1		1		2	
Nephtys ferruginea	5001250111			5	12					1	4
Nephtys sp.	50012501				1		1				
Nereidae	500124				1						
Nereis procera	5001240404			3	3		1		1	3	
Nereis sp.	50012404										
Nereis zonata	5001240406									1	
Notomastus latericeus	5001600306										
Notomastus sp.	50016003										
Notomastus tenuis	5001600302	19	34	41	24	6	10	9	6	7	4
Odontosyllis phosphorea	5001231303	1									
Onuphidae	500129										1
Onuphis elegans	5001290111									1	1
Ophelina acuminata	5001560607				1		1				
Owenia fusiformis	5001640102										
Paleanotus bellis	5001080101										
Paranaitis polynoides											
Parandalia fauveli	5001220802										
Paraonidae	500141										
Paraprionospio pinnata	5001431701			1	1		1	3	1	1	3
Parougia caeca	5001360505										
Pectinaria californiensis	5001660304				2			1		1	1
Pectinaria granulata	5001660303	1	2	2	3	8	8	6	9	4	7
Pectinaria sp.	50016603										
Petaloproctus tenuis borealis	5001630701 01										
Pherusa plumosa	5001540302										
Pholoe minuta	5001060101										
Pholoides aspera	5001040101	1				3	2	1	4		
Phyllochaetopterus prolifica	5001490202						1			1	2
Phyllodoce cuspidata											
Phyllodoce groenlandica	5001130102										
Phyllodoce hartmanae	5001131402	2		1			2	1			1
Phyllodoce longipes		2	3	1	1			1			
Phyllodoce sp.	50011314				6						
Phyllodocidae	500113										
Pilargis maculata				1							
Pista brevibranchiata	5001680710		4		1						
Pista cristata	5001680701									1	
Pista disjuncta		2	2	3		1			1	5	3
Pista elongata					1						
Pista moorei	5001680712									3	1
Pista sp.	50016807				1						3
Platynereis bicanaliculata	5001240501						1	1			1
Podarke pugettensis	5001210401										
Podarkeopsis glabrus											
Polycirrus sp. complex	50016808	3	3	4	13	9	4	6	8	6	11
Polydora brachycephala	5001430429		1	1		1	1			1	1
Polydora cardalia	5001430431					1	2		1		
Polydora cauleryi			1		2	1		2		2	
Polydora kempi											
Polydora limicola				1					4	1	1
Polydora socialis	5001430402	11	20	25	28	32	20	23	31	31	31
Polydora sp.	50014304							1			
Polynoidae	5001022687		1							1	1
Praxillella affinis pacifica	5001630000901	6									
Praxillella gracilis	5001630901		3	1	2		1			1	
Praxillella praetermissa									2		
Praxillella sp.	50016309										
Prionospio lighti	5001430521		1	3							
Prionospio multibranchiata	5001430599					1	1			1	
Prionospio sp.											
Prionospio steenstrupi	5001430506	5	4	6	17	5	10	3	2	1	
Protodorvillea gracilis	5001360201										
Pseudopotamilla intermedia	5001700701										
Pseudopotamilla occelata											
Pseudopotamilla sp.	50017006										
Pterocirrus macroceros	5001131701										
Raricirrus maculatus											
Rhodine bitorquata	5001631001		1	1							
Sabellaria cementarium	5001650201						1				5

ANNELIDA	NODC CODE	HY1I-1	HY1I-2	HY1I-3	HY1I-4	HY2I-1	HY2I-2	HY2I-3	HY2I-7	HY3I-1	HY3I-2
Sabellidae	500170										2
Scalibregma inflatum	5001570101								1		
Schistocomus hiltoni	5001672501									1	
Scoletoma luti		16	20	29	12	23	14	16	17	25	45
Sigambra tentaculata	5001220201										
Sphaerodoropsis sphaerulifer	5001260202										
Sphaerosyllis brandhorsti	5001230806										
Spio filicornis	5001430701										
Splochaetopterus costarum	5001490302	16	20	16	11	8	6	7	7	11	9
Sponidae	500143										
Spiophanes berkeleyorum	5001431004	3	3	2	3		1				1
Spiophanes sp.	50014310										
Sternaspis scutata	5001590101	1									
Sthenelais tertiaglabra	5001060305			2	1					2	
Streblosoma bairdi	5001682502										
Syllis harti	5001230510										
Tenonia priops	5001022689		1	1							
Terebellidae	500168		1					1		1	
Terebellides californica	5001690103										
Terebellides sp.	50016901						1				
Terebellides stroemi	5001690101										
Thelepus setosus	5001061004										
Trochochaeta multisetosa	5001450102										
Oligochaeta	5004										
Abundance		471	430	583	578	662	311	367	446	490	646
Richness											

ANNELIDA	HY3I-3	HY3I-7	HY4I-4	HY4I-5	HY4I-6	HY4I-7	HY5I-1	HY5I-2	HY5I-4	HY5I-6	HY6I-1	HY6I-3
Amage anops	6	1							1			
Ampharete acutifrons	4		1			3		1		2	1	3
Ampharete finmarchica	3	7	1		2	1						
Ampharete labrops		3			2				1			
Ampharete sp.												2
Ampharetidae	1											
Amphicteis mucronata												
Anobothrus gracilis		1				1	4	1				
Aphelochaeta monilaris	16	12	4	1	2	6	27	8	17	25		3
Aphelochaeta sp. C	473	271	355	142	240	359	491	403	419	593	194	233
Aphelochaeta spp.												
Arabellidae												
Aricidea lopezi									1			
Aricidea ramosa												
Armandia brevis												
Artacama coniferi							2		1			
Artacamella hancocki					1							
Asabellides lineata	21	10	1	2	1	2						2
Asabellides sibirica												
Barantolla americana							1	3	1		10	
Boccardia pugettensis			4	1	3	6	2	1	1			
Boccardiella hamata	6	7				4		1				
Capitella capitata	1	4		1			1		1	1	1	1
Caulleriella sp. A												
Chaetozone acuta	2	1							2			
Chaetozone setosa	16	10	9	2	5		7		9	7	6	4
Chaetozone sp.												
Chirimia similis												
Cirratulidae												
Cirratulus cirratus	8	6	1			2				1	1	1
Cirratulus sp.												
Glycinella columbiana		1										
Cossura pygodactylata							4		3			1
Cossura sp.	6											
Demonax medius		1										
Diopatra ornata				1		1				1	1	
Dorvillea rudolphi												
Drilonereis falcata minor												
Ehlersia heterochaeta												
Eteone californica												
Eteone longa							1					
Eteone sp.												
Eteone spilotus												
Euchone incolor	1	1			3		3	1			1	11
Euchone limnicola		1		1	2							
Euchone spp.												
Euclymene cf. zonalis												
Euclymeninae												
Eudistylia catherinae												
Eulalia bilineata												
Eulalia sanguinea	1							1	1			
Eusyllis habei												
Exogone molesta												
Galathowenia oculata	1											
Glycera americana								1				
Glycera nana	4	2	2	1			3		4	6		1
Glycera sp.											1	
Glycinde armigera												
Glycinde picta	1	1					1		2		1	
Glycinde polygnatha												
Goniada brunnea		2										
Goniada maculata												
Gyptis brevipalpa												
Harmothoe imbricata												
Harmothoidae sp.												
Hesionidae												
Heteromastus filobranchus	1			1	1					3		
Heteromastus sp.			2									
Lanassa nordenskioeldi	4	2	1	1	1	1	3	3		1	2	8
Lanassa venusta												
Laonice cirrata												1
Laonice pugettensis												
Laonice spp.												
Leitoscoloplos pugettensis	1			1	1	1	1		3			
Lepidasthenia berkeleyae				1								
Lepidasthenia longicirrata												
Lepidonotus squamatus										1		
Levinsenia gracilis									1			
Lumbrineridae	16	3	8	3	2	1	20	13	5	14	9	8
Lumbrineris californiensis	13	5	8	3	1	2	4		5	14		
Lumbrineris cruzensis												
Magelona longicornis	3	6	2	2		6	3	1	3		3	2
Magelona sp.												

ANNELIDA	HY3I-3	HY3I-7	HY4I-4	HY4I-5	HY4I-6	HY4I-7	HY5I-1	HY5I-2	HY5I-4	HY5I-6	HY6I-1	HY6I-3
Maldane sarsi												
Maldanidae					1		1					
Malmgreniella bansei												1
Mediomastus ambiseta			2									
Mediomastus californiensis	2						2		1	7		
Mediomastus sp.		4		2				3	5		1	
Melinna oculata	1					1						1
Mesochaetopterus taylori	1							1		2		1
Microphthalmus sczelkowii												
Micropodarke dubia												2
Neoamphitrite edwardsi												
Neoamphitrite robusta												
Nephtys caeca												
Nephtys cornuta	4						2	1	2			5
Nephtys ferruginea	5			1	4		1		2		1	2
Nephtys sp.			1				1			9		
Nereidae												
Nereis procera		2	1						1			
Nereis sp.		1										
Nereis zonata	2											
Notomastus latericeus								1				
Notomastus sp.												
Notomastus tenuis	2	5	8	6	7	13	22	7	8	22	3	
Odontosyllis phosphorea												
Onuphidae												
Onuphis elegans										1		
Ophelina acuminata												
Owenia fusiformis												
Paleanotus bellis												
Paranaitis polynoides	1											
Parandalia fauveli												
Paraonidae												
Paraprionospio pinnata	1	2	1	2	2				2			2
Parougia caeca							1					
Pectinaria californiensis	1				1							
Pectinaria granulata	5	5	1						1			
Pectinaria sp.												
Petaloproctus tenuis borealis												
Pherusa plumosa												
Pholoe minuta		1							1			
Pholoides aspera	4	1						1				
Phyllochaetopterus prolifica								1		1	1	
Phyllodoce cuspidata												
Phyllodoce groenlandica												
Phyllodoce hartmanae	3			1		1	3		3	1		1
Phyllodoce longipes												
Phyllodoce sp.		1	1									
Phyllodocidae	1											
Pilargis maculata			1		1							
Pista brevibranchiata												
Pista cristata												
Pista disjuncta	3	2		1		1			3			2
Pista elongata												
Pista moorei												
Pista sp.												
Platynereis bicanaliculata	1							1	2	2		
Podarke pugettensis	4									2		
Podarkeopsis glabrus												
Polycirrus sp. complex	7	17	3	3	3	3	2	2	2	4		7
Polydora brachycephala	1						2		2	2	3	
Polydora cardalia							1	2	1			
Polydora caulleryi		1				1	2		1	1		
Polydora kempi												
Polydora limicola		1				1				1		
Polydora socialis	43	35	27	14	31	21	100	37	94	93	8	37
Polydora sp.											1	
Polynoidae									1			
Praxillella affinis pacifica												
Praxillella gracilis		1										
Praxillella praetermissa												
Praxillella sp.												
Prionospio lighti						1						
Prionospio multibranchiata	1											
Prionospio sp.												
Prionospio steenstrupi	8		7	2	12	6	24	8	13	23	7	33
Protodorvillea gracilis												
Pseudopotamilla intermedia												
Pseudopotamilla occelata		2										
Pseudopotamilla sp.										1		
Pterocirrus macroceros	1											
Raricirrus maculatus												
Rhodine bitorquata												1
Sabellaria cementarium	6	1			1		1					

ANNELIDA	HY3I-3	HY3I-7	HY4I-4	HY4I-5	HY4I-6	HY4I-7	HY5I-1	HY5I-2	HY5I-4	HY5I-6	HY6I-1	HY6I-3
Sabellidae		1										
Scalibregma inflatum												
Schistocomus hiltoni	1	1										
Scoletoma luti	30	24	12	6	15	23	31	18	20	41	6	3
Sigambra tentaculata												
Sphaerodoropsis sphaerulifer									1			
Sphaerosyllis brandhorsti							1					
Spio filicornis												
Spiochaetopterus costarum	9	22		3	5	5	6	5	3	4	3	3
Spionidae												
Spiophanes berkeleyorum					1				6	5		2
Spiophanes sp.												
Sternaspis scutata												
Sthenelais tertiaglabra		1										
Streblosoma bairdi				1								
Syllis harti												
Tenonia priops											1	
Terebellidae	3				1		1					
Terebellides californica									2	1		
Terebellides sp.												
Terebellides stroemi												
Thelepus setosus												
Trochochaeta multisetosa												
Oligochaeta												
Abundance	760	489	464	206	352	473	782	526	658	892	266	384
Richness												

ANNELIDA	HY6I-6	HY6I-7	HY7I-1	HY7I-2	HY7I-3	HY7I-6	HY8I-1	HY8I-4	HY8I-5	HY8I-7	HY9I-1	HY9I-2
Amage anops		1		2	1							
Ampharete acutifrons	1	2	1	1								
Ampharete finmarchica			1	1								
Ampharete labrops		1								1		
Ampharete sp.												
Ampharetidae												1
Amphicteis mucronata												
Anobothrus gracilis	1											
Aphelochaeta monilaris	3	1	15	4	10	16	5	3	2	6	1	
Aphelochaeta sp. C	299	166	454	450	321	34	148	166	136	315	572	1
Aphelochaeta spp.												
Arabellidae												
Aricidea lopezi										1		
Aricidea ramosa												
Armandia brevis												
Artacama coniferi											1	
Artacamella hancocki												
Asabellides lineata	1	1		4								
Asabellides sibirica												
Barantolla americana					2							
Boccardia pugettensis				1								
Boccardiella hamata			2		4			1	2	1		
Capitella capitata	3	2							1		2	1
Caulleriella sp. A												
Chaetozone acuta	1	2		1				3				
Chaetozone setosa	2	4	2	6	2		4	2	1	18		
Chaetozone sp.												
Chirimia similis												
Cirratulidae					2							
Cirratulus cirratus												
Cirratulus sp.												
Clymenura columbiana												
Cossura pygodactylata	2		1				1			2	3	
Cossura sp.			1		1							
Demonax medius												
Diopatra ornata												
Dorvillea rudolphi												
Drilonereis falcata minor					1							
Ehlersia heterochaeta												
Eteone californica												
Eteone longa				2								
Eteone sp.												
Eteone spilotus												
Euchone incolor	5	3	1	4						2		
Euchone limnicola			1		3			1	1			
Euchone spp.												
Eucolymene cf. zonalis												
Euclymeninae												
Eudistylia catherinae												
Eulalia bilineata												
Eulalia sanguinea												
Eusyllis habei												
Exogone molesta												
Galathowenia oculata												
Glycera americana		1										
Glycera nana			1	2	1				2	2	1	
Glycera sp.												
Glycinde armigera												
Glycinde picta	2			1			1		1	2		1
Glycinde polygnatha												
Goniada brunnea	1				1	1						
Goniada maculata												
Gyptis brevipalpa												
Harmothoe imbricata												
Harmothoidae sp.												
Hesionidae												
Heteromastus filobranchus										1		
Heteromastus sp.												
Lanassa nordenskioeldi	1	3	1	6	1						1	
Lanassa venusta										1		
Laonice cirrata				1								
Laonice pugettensis												
Laonice spp.												
Leitoscoloplos pugettensis	2		2	2	2			1				
Lepidasthenia berkeleyae												
Lepidasthenia longicirrata												
Lepidonotus squamatus												
Levinsenia gracilis				1						1		1
Lumbrineridae	7	19	17	19	6	9	2			18	41	5
Lumbrineris californiensis				1			1		1			
Lumbrineris cruzensis												
Magelona longicornis	1		3		2		1		1	10		
Magelona sp.												

ANNELIDA	HY6I-6	HY6I-7	HY7I-1	HY7I-2	HY7I-3	HY7I-6	HY8I-1	HY8I-4	HY8I-5	HY8I-7	HY9I-1	HY9I-2
Maldane sarsi												
Maldanidae										1		
Malmgreniella bansei												
Mediomastus ambiseta												
Mediomastus californiensis								2				
Mediomastus sp.			2	1	2					1	2	
Melinna oculata			1									
Mesochaetopterus taylori	1	1	2	4								
Microphthalmus sczelkowii												
Micropodarke dubia												
Neoamphitrite edwardsi												
Neoamphitrite robusta												
Nephtys caeca												
Nephtys cornuta	3	3				1	1			1	14	4
Nephtys ferruginea	1		1									3
Nephtys sp.												
Nereidae												
Nereis procera	1	1		2		1						
Nereis sp.												
Nereis zonata												
Notomastus latericeus												
Notomastus sp.												
Notomastus tenuis	1		8		8	2	4	3	5	3		
Odontosyllis phosphorea												
Onuphidae												
Onuphis elegans												
Ophelina acuminata											1	3
Owenia fusiformis												
Paleanotus bellis		1										
Paranaitis polynoides												
Parandalia fauveli												
Paraonidae												
Paraprionospio pinnata	1		2	2			1	1	3	1		
Parougia caeca												
Pectinaria californiensis												
Pectinaria granulata	1	2										
Pectinaria sp.												
Petaloproctus tenuis borealis												
Pherusa plumosa												
Pholoe minuta												
Pholoides aspera		2										
Phyllochaetopterus prolifica							1		3			
Phyllodoce cuspidata												
Phyllodoce groenlandica												
Phyllodoce hartmanae		1		1			1		4	1	1	
Phyllodoce longipes												
Phyllodoce sp.	1											
Phyllodocidae												
Pilargis maculata												
Pista brevibranchiata	2											
Pista cristata												
Pista disjuncta			1	2		1	1					
Pista elongata												
Pista moorei												
Pista sp.												
Platynereis bicanaliculata		2		1	1							
Podarke pugettensis		3		1					1			
Podarkeopsis glabrus												
Polycirrus sp. complex	3	3	7	3	1					1		
Polydora brachycephala				2	1		1				1	
Polydora cardalia			2								1	
Polydora caulleryi		1					2			1		
Polydora kempi												
Polydora limicola	1			1								
Polydora socialis	10	4	62	26	31	3	16	20	20	49	7	1
Polydora sp.												
Polynoidae	1			1								
Praxillella affinis pacifica												
Praxillella gracilis												
Praxillella praetermissa												
Praxillella sp.												
Prionospio lighti	1							2				
Prionospio multibranchiata												
Prionospio sp.	1											
Prionospio steenstrupi	12	11	7	18	4		3	2	2	15	9	
Protodorvillea gracilis												
Pseudopotamilla intermedia												
Pseudopotamilla occelata												
Pseudopotamilla sp.												
Pterocirrus macroceros												
Raricirrus maculatus												
Rhodine bitorquata												
Sabellaria cementarium												

ANNELIDA	HY6I-6	HY6I-7	HY7I-1	HY7I-2	HY7I-3	HY7I-6	HY8I-1	HY8I-4	HY8I-5	HY8I-7	HY9I-1	HY9I-2
Sabellidae	1											
Scalibregma inflatum												
Schistocomus hiltoni												
Scoletoma luti	10	6	7	18	16	1	19	14	24	32	4	
Sigambra tentaculata												
Sphaerodoropsis sphaerulifer												
Sphaerosyllis brandhorsti												
Spio filicornis												
Spiochaetopterus costarum	4		3	3	2	2	7	2	4	2		
Spionidae												
Spiophanes berkeleyorum	1	1	2						1	3		
Spiophanes sp.												
Sternaspis scutata							1					
Sthenelais tertiaglabra						1						
Streblosoma bairdi												
Syllis harti												
Tenonia priops												
Terebellidae												
Terebellides californica											1	1
Terebellides sp.												
Terebellides stroemi												
Thelepus setosus												
Trochochaeta multisetosa											1	
Oligochaeta												
Abundance	389	248	610	595	426	72	221	223	215	492	664	22
Richness												

ANNELIDA	HY9I-3	HY9I-4	HY10I-3	HY10I-5	HY10I-6	HY10I-7	HY11I-1	HY11I-3	HY11I-4	HY11I-7	HY12I-1	HY12I-4
Amage anops	1											
Ampharete acutifrons												
Ampharete finmarchica												
Ampharete labrops			1									
Ampharete sp.												
Ampharetidae	1											
Amphicteis mucronata												
Anobothrus gracilis												
Aphelochaeta monilaris			6	4		4				5	17	18
Aphelochaeta sp. C	11	24	200	607		122	43	13		5	279	189
Aphelochaeta spp.							4					
Arabellidae												
Aricidea lopezi												1
Aricidea ramosa												
Armandia brevis												
Artacama coniferi												1
Artacamella hancocki												
Asabellides lineata									1			
Asabellides sibirica												
Barantolla americana											1	
Boccardia pugettensis												
Boccardiella hamata												
Capitella capitata	2	2		1		1					2	
Caulleriella sp. A		1										
Chaetozone acuta	1											
Chaetozone setosa			7	3		2	5		2	3	22	19
Chaetozone sp.												
Chirimia similis												
Cirratulidae			59		129	91		92	266	208		
Cirratulus cirratus												
Cirratulus sp.												
Clymenura columbiana												
Cossura pygodactylata											2	
Cossura sp.			3	3	1	4		1				
Demonax medius												
Diopatra ornata									1			
Dorvillea rudolphi												
Drilonereis falcata minor												
Ehlersia heterochaeta												
Eteone californica												
Eteone longa												
Eteone sp.												
Eteone spilotus												
Euchone incolor												3
Euchone limnicola												
Euchone spp.												
Euclymene cf. zonalis												
Eucymeninae												
Eudistylia catherinae												
Eulalia bilineata												
Eulalia sanguinea												
Eusyllis habei												
Exogone molesta												
Galathowenia oculata												
Glycera americana												
Glycera nana	1								2			
Glycera sp.												
Glycinde armigera											1	
Glycinde picta								1		3	1	
Glycinde polygnatha							1					
Goniada brunnea								1				
Goniada maculata												
Gyptis brevipalpa												
Harmothoe imbricata												
Harmothoidae sp.												
Hesionidae												
Heteromastus filobranchus												
Heteromastus sp.												
Lanassa nordenskioeldi	2	2									1	1
Lanassa venusta												
Laonice cirrata		1										
Laonice pugettensis												
Laonice spp.												
Leitoscoloplos pugettensis			1				1			1	1	
Lepidasthenia berkeleyae												
Lepidasthenia longicirrata												1
Lepidonotus squamatus												
Lovinconia gracilis			1			1				1		2
Lumbrineridae	23	19	19	25	10	6	1	9	16	21	5	1
Lumbrineris californiensis											1	
Lumbrineris cruzensis												
Magelona longicornis												
Magelona sp.												

ANNELIDA	HY9I-3	HY9I-4	HY10I-3	HY10I-5	HY10I-6	HY10I-7	HY11I-1	HY11I-3	HY11I-4	HY11I-7	HY12I-1	HY12I-4
Maldane sarsi												
Maldanidae								1				
Malmgreniella bansei												
Mediomastus ambiseta												
Mediomastus californiensis											3	
Mediomastus sp.										1		
Melinna oculata	1											
Mesochaetopterus taylori											1	
Microphthalmus sczelkowii												
Micropodarke dubia												
Neoamphitrite edwardsi												1
Neoamphitrite robusta												
Nephtys caeca												
Nephtys cornuta	11	21	6	17	1			1	1	2	7	3
Nephtys ferruginea											1	1
Nephtys sp.												
Nereidae												
Nereis procera												
Nereis sp.												
Nereis zonata												
Notomastus latericeus											1	
Notomastus sp.			1	1	3	7				1		
Notomastus tenuis							1				2	4
Odontosyllis phosphorea												
Onuphidae	1											
Onuphis elegans												
Ophelina acuminata	9										1	
Owenia fusiformis												
Paleanotus bellis												
Paranaitis polynoides												
Parandalia fauveli												
Paraonidae												
Paraprionospio pinnata			2	2				1	1		1	1
Parougia caeca												
Pectinaria californiensis												
Pectinaria granulata												
Pectinaria sp.												
Petaloproctus tenuis borealis												
Pherusa plumosa												
Pholoe minuta												
Pholoides aspera		2										
Phyllochaetopterus prolifica												4
Phyllodoce cuspidata											1	
Phyllodoce groenlandica												
Phyllodoce hartmanae												
Phyllodoce longipes												
Phyllodoce sp.												
Phyllodocidae												
Pilargis maculata					1	1						
Pista brevibranchiata												
Pista cristata			1									
Pista disjuncta	1											6
Pista elongata												
Pista moorei												
Pista sp.							1					
Platynereis bicanaliculata							2					
Podarke pugettensis		2										
Podarkeopsis glabrus												
Polycirrus sp. complex	3	3									3	4
Polydora brachycephala	2	1										1
Polydora cardalia											1	
Polydora caulleryi												
Polydora kempi												
Polydora limicola		1										
Polydora socialis	3	1	12	20	3	10	7	3	9		28	25
Polydora sp.			6	3								
Polynoidae		1										
Praxillella affinis pacifica												
Praxillella gracilis												
Praxillella praetermissa												
Praxillella sp.												
Prionospio lighti												
Prionospio multibranchiata												
Prionospio sp.												
Prionospio steenstrupi		4	17	19	1	1	1	1	7	1	7	7
Protodorvillea gracilis												
Pseudopotamilla intermedia												
Pseudopotamilla occelata												
Pseudopotamilla sp.												
Pterocirrus macroceros												
Raricirrus maculatus												
Rhodine bitorquata												
Sabellaria cementarium											1	

ANNELIDA	HY9I-3	HY9I-4	HY10I-3	HY10I-5	HY10I-6	HY10I-7	HY11I-1	HY11I-3	HY11I-4	HY11I-7	HY12I-1	HY12I-4
Sabellidae												
Scalibregma inflatum												
Schistocomus hiltoni												
Scoletoma luti				2	6	7	20		5	5	8	14
Sigambra tentaculata												
Sphaerodoropsis sphaerulifer		1							1			
Sphaerosyllis brandhorsti	1											
Spio filicornis												
Spiochaetopterus costarum	1		1	3		3			2			3
Spionidae											1	
Spiophanes berkeleyorum												
Spiophanes sp.			3	2		1						
Sternaspis scutata				1	1		1					
Sthenelais tertiaglabra		1									1	
Streblosoma bairdi												
Syllis hartl												
Tenonia priops												
Terebellidae	1	1										
Terebellides californica	6	2										1
Terebellides sp.												
Terebellides stroemi				1				1	2			
Thelepus setosus												
Trochochaeta multisetosa												
Oligochaeta	1											
Abundance	83	90	346	714	156	261	88	125	316	257	401	311
Richness												

ANNELIDA	HY12I-5	HY12I-6	HY13I-1	HY13I-2	HY13I-6	HY13I-7	HY14I-1	HY14I-2	HY14I-3	HY14I-7	HY15I-1	HY15I-3
Amage anops		1										
Ampharete acutifrons												
Ampharete finmarchica												
Ampharete labrops					2			1	1			
Ampharete sp.												
Ampharetidae								1				
Amphicteis mucronata												
Anobothrus gracilis												
Aphelochaeta monilaris	21	6				1		2		1	9	13
Aphelochaeta sp. C	235	142	130	1	16	105	214	298	408	465	100	175
Aphelochaeta spp.												
Arabellidae												
Aricidea lopezi								1				
Aricidea ramosa												
Armandia brevis												
Artacama coniferi									1			
Artacamella hancocki												
Asabellides lineata					1							
Asabellides sibirica												
Barantolla americana												
Boccardia pugettensis	1											
Boccardiella hamata												
Capitella capitata			3		11			3	17	6		
Caulleriella sp. A			1									
Chaetozone acuta			8		11	17	13	13	37	48		
Chaetozone setosa	16	2		1			2	3	5	2	12	11
Chaetozone sp.												
Chirimia similis												
Cirratulidae												
Cirratulus cirratus	1											
Cirratulus sp.												
Clymenura columbiana												
Cossura pygodactylata	2		7		1	1	5	8	23	32		
Cossura sp.											10	24
Demonax medius												
Diopatra ornata		1	1									
Dorvillea rudolphi										1		
Drilonereis falcata minor												
Ehlersia heterochaeta												
Eteone californica												
Eteone longa										1		
Eteone sp.												
Eteone spilotus												
Euchone incolor	1		4			3	16	8	6	13		
Euchone limnicola			1		1	2	3	7	5	9		
Euchone spp.												2
Euclymene cf. zonalis												
Euclymeninae												
Eudistylia catherinae												
Eulalia bilineata												
Eulalia sanguinea		1				1						
Eusyllis habei						1						
Exogone molesta												
Galathowenia oculata												
Glycera americana												
Glycera nana	1	1			1			1		1		
Glycera sp.												
Glycinde armigera												
Glycinde picta			1			1	2			2		
Glycinde polygnatha												
Goniada brunnea												
Goniada maculata												
Gyptis brevipalpa												1
Harmothoe imbricata												
Harmothoidae sp.												
Hesionidae												
Heteromastus filobranchus				1								
Heteromastus sp.											2	
Lanassa nordenskioeldi	4	1	2					2	1			
Lanassa venusta												
Laonice cirrata			1									
Laonice pugettensis												
Laonice spp.												
Leitoscoloplos pugettensis	1								1			
Lepidasthenia berkeleyae												
Lepidasthenia longicirrata												
Lepidonotus squamatus												
Levinsenia gracilis			1			1			1	2		
Lumbrineridae	3	4	16		4	8	8	14	14	29	22	21
Lumbrineris californiensis			2			1				1		
Lumbrineris cruzensis												
Magelona longicornis		1										
Magelona sp.												

ANNELIDA	HY12I-5	HY12I-6	HY13I-1	HY13I-2	HY13I-6	HY13I-7	HY14I-1	HY14I-2	HY14I-3	HY14I-7	HY15I-1	HY15I-3
Maldane sarsi												
Maldanidae										1		
Malmgreniella bansei												
Mediomastus ambiseta												
Mediomastus californiensis	1						1					
Mediomastus sp.			3					1	1	3		
Melinna oculata												
Mesochaetopterus taylori												
Microphthalmus sczelkowii												
Micropodarke dubia												
Necamphitrite edwardsi												
Necamphitrite robusta												
Nephtys caeca												
Nephtys comuta	9		2		1	1	1	2		3	7	13
Nephtys ferruginea	1		1		1	1		1			1	
Nephtys sp.												
Nereidae												
Nereis procera					1					1		
Nereis sp.												
Nereis zonata												
Notomastus latericeus												
Notomastus sp.											1	1
Notomastus tenuis	4	2										
Odontosyllis phosphorea												
Onuphidae												
Onuphis elegans												
Ophelina acuminata			1									
Owenia fusiformis												
Paleanotus bellis												
Paranaitis polynoides												
Parandalia fauveli												
Paraonidae												
Paraprionospio pinnata	1		1		1	2			2	3		
Parougia caeca												
Pectinaria californiensis												
Pectinaria granulata												
Pectinaria sp.												
Petaloproctus tenuis borealis												
Pherusa plumosa												
Pholoe minuta												1
Pholoides aspera	1					1						
Phyllochaetopterus prolifica												
Phyllodoce cuspidata												
Phyllodoce groenlandica												
Phyllodoce hartmanae							2			1		
Phyllodoce longipes			1									
Phyllodoce sp.												
Phyllodocidae												
Pilargis maculata												
Pista brevibranchiata								2				
Pista cristata												
Pista disjuncta	2	1				2		1				
Pista elongata												
Pista moorei												
Pista sp.			1									1
Platynereis bicanaliculata												
Podarke pugettensis		1										
Podarkeopsis glabrus					2				1			
Polycirrus sp. complex	7						3	2				
Polydora brachycephala	1	1								2		
Polydora cardalia							1					
Polydora caulleryi	1											
Polydora kempi												
Polydora limicola												
Polydora socialis	23	12	16		3	1	8	7	8	20	2	7
Polydora sp.					1	1					3	
Polynoidae												
Praxillella affinis pacifica												
Praxillella gracilis												
Praxillella praetermissa												
Praxillella sp.												
Prionospio lighti						1		1		1		
Prionospio multibranchiata												
Prionospio sp.												
Prionospio steenstrupi	13	1	30	1	5	16	6	4	11	8	2	2
Protodorvillea gracilis												
Pseudopotamilla intermedia												
Pseudopotamilla occelata												
Pseudopotamilla sp.												
Pterocirrus macroceros												
Raricirrus maculatus												
Rhodine bitorquata												
Sabellaria cementarium												

ANNELIDA	HY12I-5	HY12I-6	HY13I-1	HY13I-2	HY13I-6	HY13I-7	HY14I-1	HY14I-2	HY14I-3	HY14I-7	HY15I-1	HY15I-3
Sabellidae												
Scalibregma inflatum												
Schistocomus hiltoni												
Scoletoma luti	15	5	3				2	2	5	8	2	6
Sigambra tentaculata												
Sphaerodoropsis ophaerulifer												
Sphaerosyllis brandhorsti						1						
Spio filicornis												
Splochaetopterus costarum	1	5				1			1			
Spionidae												
Spiophanes berkeleyorum	1						4					
Spiophanes sp.												
Sternaspis scutata												
Sthenelais tertiaglabra												
Streblosoma bairdi												
Syllis hartl												
Tenonia priops												
Terebellidae						2			1			
Terebellides californica	1									1		
Terebellides sp.		1										
Terebellides stroemi												1
Thelepus setosus												
Trochochaeta multisetosa												
Oligochaeta												
Abundance	368	189	237	4	63	172	291	385	550	667	173	279
Richness												

ANNELIDA	HY15I-4	HY15I-5	HY16I-2	HY16I-3	HY16I-4	HY16I-6	HY17I-1	HY17I-2	HY17I-5	HY17I-6	HY18I-1	HY18I-2
Amage anops		1										
Ampharete acutifrons										1		
Ampharete finmarchica											1	
Ampharete labrops									1		1	
Ampharete sp.												
Ampharetidae								1				
Amphicteis mucronata												
Anobothrus gracilis												
Aphelochaeta monilaris	6	8	6		16	1					25	4
Aphelochaeta sp. C	99	115	422	38	249	160	35	31	44	5	627	267
Aphelochaeta spp												
Arabellidae												
Aricidea lopezi												
Aricidea ramosa												
Armandia brevis								1		1		
Artacama coniferi												
Artacamella hancocki												
Asabellides lineata												
Asabellides sibirica												
Barantolla americana												
Boccardia pugettensis												
Boccardiella hamata												
Capitella capitata					1		2	1	1			
Cauleriella sp. A												
Chaetozone acuta							44	25	45	8	7	8
Chaetozone setosa	1	8	7		20	8					2	3
Chaetozone sp.			1	3	1	13						
Chirimia similis												
Cirratulidae			3	88	17	51						
Cirratulus cirratus								1				
Cirratulus sp.			1			1						
Clymenura columbiana												
Cossura pygodactylata							3		1	2	16	6
Cossura sp.	1	4	1	7	24	5						
Demonax medius												
Diopatra ornata												
Dorvillea rudolphi												
Drilonereis falcata minor												
Ehlersia heterochaeta												
Eteone californica												
Eteone longa							1					
Eteone sp.												
Eteone spilotus												
Euchone incolor							1			3	41	18
Euchone limnicola							9	9	10	4	17	8
Euchone spp.	1			6	9							
Euclymene cf. zonalis												
Eucymeninae												
Eudistylia catherinae												
Eulalia bilineata												
Eulalia sanguinea											1	
Eusyllis habei												
Exogone molesta												
Galathowenia oculata												
Glycera americana				1								
Glycera nana				1	1				1			
Glycera sp.												
Glycinde armigera												1
Glycinde picta	1				1		1					1
Glycinde polygnatha												
Goniada brunnea												
Goniada maculata												
Gyptis brevipalpa												
Harmothoe imbricata												
Harmothoidae sp.												
Hesionidae												
Heteromastus filobranchus					2						1	
Heteromastus sp.												
Lanassa nordenskioeldi											2	3
Lanassa venusta												
Laonice cirrata												
Laonice pugettensis												
Laonice spp.												
Leitoscoloplos pugettensis												
Lepidasthenia berkeleyae												
Lepidasthenia longicirrata												
Lepidonotus squamatus												
Levinsenia gracilis					1							
Lumbrineridae	13	14	15	13	22	7			3		9	7
Lumbrineris californiensis												
Lumbrineris cruzensis												5
Magelona longicornis												
Magelona sp.												

ANNELIDA	HY15I-4	HY15I-5	HY16I-2	HY16I-3	HY16I-4	HY16I-6	HY17I-1	HY17I-2	HY17I-5	HY17I-6	HY18I-1	HY18I-2
Maldane sarsi												
Maldanidae												
Malmgreniella bansei												
Mediomastus ambiseta												
Mediomastus californiensis												
Mediomastus sp.							1					
Melinna oculata												
Mesochaetopterus taylori												
Microphthalmus sczelkowii												
Micropodarke dubia							1			1	1	
Neoamphitrite edwardsi												
Neoamphitrite robusta												
Nephtys caeca												
Nephtys cornuta	2	2	4	2	12	3	5		5	9	37	9
Nephtys ferruginea							1			1		
Nephtys sp.												
Nereidae												
Nereis procera												
Nereis sp.												
Nereis zonata												
Notomastus latericeus												
Notomastus sp.	3											
Notomastus tenuis												
Odontosyllis phosphorea												
Onuphidae												
Onuphis elegans												
Ophelina acuminata												
Owenia fusiformis												
Paleanotus bellis												
Paranaitis polynoides												
Parandalia fauveli												
Paronidae									1			
Paraprionospio pinnata		2	1		2	1	3	1	2		1	1
Parougia caeca												
Pectinaria californiensis											1	
Pectinaria granulata												
Pectinaria sp.												
Petaloproctus tenuis borealis												
Pherusa plumosa												
Pholoe minuta		1			1							
Pholoides aspera												
Phyllochaetopterus prolifica												
Phyllodoce cuspidata												
Phyllodoce groenlandica												
Phyllodoce hartmanae										1	1	1
Phyllodoce longipes											1	
Phyllodoce sp.												
Phyllodocidae												
Pilargis maculata												
Pista brevibranchiata												
Pista cristata												
Pista disjuncta												1
Pista elongata												
Pista moorei												
Pista sp.												
Platynereis bicanaliculata												
Podarke pugettensis								1				
Podarkeopsis glabrus											1	
Polycirrus sp. complex												3
Polydora brachycephala												
Polydora cardalia											4	4
Polydora cauleryi											1	
Polydora kempi												
Polydora limicola												
Polydora socialis	9	8	7	1	13	8	6	1	2	8	13	5
Polydora sp.			1	2	6			1				
Polynoidae												
Praxillella affinis pacifica												
Praxillella gracilis												
Praxillella praetermissa												
Praxillella sp.												
Prionospio lighti										1		1
Prionospio multibranchiata												
Prionospio sp.												
Prionospio steenstrupi	3		1		6	4	11	4	8	1	5	4
Protodorvillea gracilis												
Pseudopotamilla intermedia												
Pseudopotamilla occelata												
Pseudopotamilla sp.												
Pterocirrus macroceros												
Raricirrus maculatus												
Rhodine bitorquata												
Sabellaria cementarium												

ANNELIDA	HY15I-4	HY15I-5	HY16I-2	HY16I-3	HY16I-4	HY16I-6	HY17I-1	HY17I-2	HY17I-5	HY17I-6	HY18I-1	HY18I-2
Sabellidae						6						
Scalibregma inflatum												
Schistocomus hiltoni												
Scoletoma luti	4	5	6		3	6	3				21	21
Sigambra tentaculata												
Sphaerodoropsis sphaerulifer												
Sphaerosyllis brandhorsti										2		
Spio filicornis												
Spiochaetopterus costarum		1	1									
Spionidae												
Spiophanes berkeleyorum												
Spiophanes sp.												
Sternaspis scutata												
Sthenelais tertiaglabra												
Streblosoma bairdi												
Syllis harti												
Tenonia priops								1				
Terebellidae												
Terebellides californica												
Terebellides sp.												
Terebellides stroemi												
Thelepus setosus												
Trochochaeta multisetosa												
Oligochaeta							1					
Abundance	143	169	477	162	407	274	128	78	124	48	837	381
Richness												

ANNELIDA	HY18I-4	HY18I-5	HY19I-2	HY19I-3	HY19I-4	HY19I-5	HY20I-1	HY20I-2	HY20I-4	HY20I-5	HY21I-1	HY21I-2
Amage anops					1				1			
Ampharete acutifrons								1				
Ampharete finmarchica	1	1							2			1
Ampharete labrops		1	1	1	5			1			1	2
Ampharete sp.		1										
Ampharetidae												1
Amphicteis mucronata												
Anobothrus gracilis					1							
Aphelochaeta monilaris	18	13	10	22	27	30	15	8	9	15	18	5
Aphelochaeta sp. C	403	140	310	294	323	706	432	373	124	470	250	673
Aphelochaeta spp.												
Arabellidae												
Aricidea lopezi				1	1	1		1				
Aricidea ramosa												
Armandia brevis												
Artacama coniferi			2				2					
Artacamella hancocki												
Asabellides lineata												
Asabellides sibirica												
Barantolla americana												
Boccardia pugettensis												
Boccardiella hamata		1										
Capitella capitata			2								1	2
Caulleriella sp. A												
Chaetozone acuta	1	2	4	2	1	2					35	32
Chaetozone setosa	2	1	6	7	9	12	7	11	1	9		2
Chaetozone sp. *												
Chirimia similis												
Cirratulidae												
Cirratulus cirratus			1			1	13	13	4	6	5	5
Cirratulus sp.												
Clymenura columbiana												
Cossura pygodactylata	8	1	16	30	36	36	8	19			17	50
Cossura sp.												
Demonax medius												
Diopatra ornata												
Dorvillea rudolphi												
Drilonereis falcata minor												
Ehlersia heterochaeta												
Eteone californica												
Eteone longa				1		2						
Eteone sp.												
Eteone spilotus								1				
Euchone incolor	10	5	20	16	22	10	7	10	1	3	2	20
Euchone limnicola	10	19	12	14	41	14	18	17	11	31	19	83
Euchone spp.												
Eudymene cf. zonalis												
Euclymeninae												
Eudistylia catherinae												
Eulalia bilineata												
Eulalia sanguinea				1								
Eusyllis habei												
Exogone molesta												
Galathowenia oculata												
Glycera americana												
Glycera nana	2					1		2				
Glycera sp.												
Glycinde armigera												
Glycinde picta					1		1	1		1	3	
Glycinde polygnatha												
Goniada brunnea												
Goniada maculata												
Gyptis brevipalpa												
Harmothoe imbricata												
Harmothoidae sp.												
Hesionidae												
Heteromastus filobranchus				1		2		1				1
Heteromastus sp.								1				
Lanassa nordenskioeldi	4	1	4	3	2	1			1		1	
Lanassa venusta								2				
Laonice cirrata												
Laonice pugettensis												
Laonice spp.												
Leitoscoloplos pugettensis	1				1							
Lepidasthenia berkeleyae												
Lepidasthenia longicirrata												
Lepidonotus squamatus												
Levinsenia gracilis						1						
Lumbrineridae	10	5	10	7	8	14	4	1	2		2	9
Lumbrineris californiensis						1	1					
Lumbrineris cruzensis												
Magelona longicornis												
Magelona sp.												

ANNELIDA	HY18I-4	HY18I-5	HY19I-2	HY19I-3	HY19I-4	HY19I-5	HY20I-1	HY20I-2	HY20I-4	HY20I-5	HY21I-1	HY21I-2
Maldane sarsi												
Maldanidae												
Malmgreniella bansei			1	1		1				1		
Mediomastus ambiseta												
Mediomastus californiensis												
Mediomastus sp.	1	2		1								
Melinna oculata												
Mesochaetopterus taylori												
Microphthalmus sczelkowii												
Micropodarke dubia			1		1	5						1
Neoamphitrite edwardsi												
Neoamphitrite robusta												
Nephtys caeca												
Nephtys cornuta	19	2	28	18	50	56	9	11		4	15	69
Nephtys ferruginea			1	3			1	2			2	
Nephtys sp.												
Nereidae												
Nereis procera												
Nereis sp.												
Nereis zonata												
Notomastus latericeus												
Notomastus sp.												
Notomastus tenuis						1		1				
Odontosyllis phosphorea												
Onuphidae												
Onuphis elegans											1	
Ophelina acuminata											1	
Owenia fusiformis												
Paleanotus bellis												
Paranaitis polynoides					1							
Parandalia fauveli												
Paraonidae						1						
Paraprionospio pinnata	2		1	1		4		1	1			2
Parougia caeca			1			1						
Pectinaria californiensis										1		
Pectinaria granulata												
Pectinaria sp.												
Petaloproctus tenuis borealis												
Pherusa plumosa												
Pholoe minuta											1	
Pholoides aspera												
Phyllochaetopterus prolifica												1
Phyllodoce cuspidata												
Phyllodoce groenlandica												
Phyllodoce hartmanae					1						1	
Phyllodoce longipes					1							
Phyllodoce sp.												
Phyllodocidae												
Pilargis maculata												
Pista brevibranchiata												
Pista cristata												
Pista disjuncta									1			
Pista elongata												
Pista moorei												
Pista sp.												
Platynereis bicanaliculata												
Podarke pugettensis				1			1					
Podarkeopsis glabrus						2						2
Polycirrus sp. complex	1	1	1	1	1	4		1				
Polydora brachycephala												
Polydora cardalia		1									1	
Polydora cauleryi	1											
Polydora kempi												
Polydora limicola												
Polydora socialis	11		4	2	8	8	10	6	3	2	1	1
Polydora sp.	3									1		1
Polynoidae	2											
Praxillella affinis pacifica												
Praxillella gracilis												
Praxillella praetermissa												
Praxillella sp.												
Prionospio lighti				1		1		1				
Prionospio multibranchiata												
Prionospio sp.												
Prionospio steenstrupi	3	3	4	1	2	2	1			1	6	2
Protodorvillea gracilis												
Pseudopotamilla intermedia			1		1							
Pseudopotamilla ocellata												
Pseudopotamilla sp.												
Pterocirrus macroceros												
Raricirrus maculatus												
Rhodine bitorquata												
Sabellaria cementarium												

ANNELIDA	HY18I-4	HY18I-5	HY19I-2	HY19I-3	HY19I-4	HY19I-5	HY20I-1	HY20I-2	HY20I-4	HY20I-5	HY21I-1	HY21I-2
Sabellidae					4	1						
Scalibregma inflatum												
Schistocomus hiltoni												
Scoletoma luti	20	11	21	26	26	21	27	16	25	27	12	30
Sigambra tentaculata												
Sphaerodoropsis sphaerulifer												
Sphaerosyllis brandhorsti			2		1	1						
Spio filicornis												
Splochaetopterus costarum												
Spionidae												
Spiophanes berkeleyorum		1				1						
Spiophanes sp.												
Sternaspis scutata												
Sthenelais tertiaglabra												
Streblosoma bairdi												
Syllis harti												
Tenonia priops												
Terebellidae												
Terebellides californica			2				1					
Terebellides sp.												
Terebellides stroemi												
Thelepus setosus												
Trochochaeta multisetosa												
Oligochaeta												
Abundance	533	212	466	456	576	944	558	502	186	572	395	995
Richness												

ANNELIDA	HY21I-4	HY21I-6	HY22I-1	HY22I-3	HY22I-5	HY22I-7	HY23I-1	HY23I-2	HY23I-4	HY23I-7	HY24I-1	HY24I-2
Amage anops												
Ampharete acutifrons					2							
Ampharete finmarchica		1		5	6	4	5	3	5	1		
Ampharete labrops	1	3	2			3	2	4		1	1	
Ampharete sp.								1				
Ampharetidae												
Amphicteis mucronata												
Anobothrus gracilis												
Aphelochaeta monilaris	12	12	5	7	7	14	12	15	6	7		2
Aphelochaeta sp. C	492	492	477	499	776	877	232	425	286	476	21	33
Aphelochaeta spp.												
Arabellidae												
Aricidea lopezi		1										
Aricidea ramosa												
Armandia brevis							1	1		3		
Artacama coniferi						1						
Artacamella hancocki												
Asabellides lineata			2									
Asabellides sibirica												
Barantolla americana												
Boccardia pugettensis												
Boccardiella hamata			1				2	1				
Capitella capitata		1	2	1		1		1		3	8	5
Caulleriella sp. A												
Chaetozone acuta	24	59	331	35	69	75	90	170	142	183	620	688
Chaetozone setosa		1	1	2	7	7	6	3	7	5		
Chaetozone sp.												
Chirimia similis												
Cirratulidae												
Cirratulus cirratus	8	13					1			2		
Cirratulus sp.												
Glycinde columbiana												
Cossura pygodactylata	15	17	21	11	12	36	2	45	22	15		
Cossura sp.											2	7
Demonax medius												
Diopatra ornata												
Dorvillea rudolphi			2					3			1	5
Drilonereis falcata minor												
Ehlersia heterochaeta												
Eteone californica												
Eteone longa	1		1		1	1		1				
Eteone sp.												
Eteone spilotus												
Euchone incolor	9	5	33	16	17	40	21	28	38	38		
Euchone limnicola	37	25	63	87	141	127	74	93	126	193		4
Euchone spp.												
Euclymene cf. zonalis												
Euclymeninae												
Eudistylia catherinae								1				
Eulalia bilineata												
Eulalia sanguinea		2							1	1		
Eusyllis habei												
Exogone molesta			1									
Galathowenia oculata												
Glycera americana							2		2	1		
Glycera nana											1	
Glycera sp.												
Glycinde armigera												
Glycinde picta		2	2			1	1	2	1	2	1	
Glycinde polygnatha												
Goniada brunnea												
Goniada maculata												
Gyptis brevipalpa												
Harmothoe imbricata												
Harmotholdae sp.												
Hesionidae												
Heteromastus filobranchus		1	1	1								
Heteromastus sp.												
Lanassa nordenskioeldi					4		4		1	1		
Lanassa venusta			1	1		1						
Laonice cirrata												
Laonice pugettensis												
Laonice spp.												
Leitoscoloplos pugettensis												
Lepidasthenia berkeleyae												
Lepidasthenia longicirrata												
Lepidonotus squamatus												
Levinsenia gracilis					1							
Lumbrineridae	3	14	8	24	28	41	9	24	26	15	2	
Lumbrineris californiensis												
Lumbrineris cruzensis								1				
Magelona longicornis												
Magelona sp.												

ANNELIDA	HY21I-4	HY21I-6	HY22I-1	HY22I-3	HY22I-5	HY22I-7	HY23I-1	HY23I-2	HY23I-4	HY23I-7	HY24I-1	HY24I-2
Maldane sarsi												
Maldanidae												
Malmgreniella bansei								2				
Mediomastus ambiseta												
Mediomastus californiensis												
Mediomastus sp.			1					2				
Melinna oculata						1						
Mesochaetopterus taylori												
Microphthalmus sczelkowii												
Micropodarke dubia	3		2					1	7	10		3
Neoamphitrite edwardsi												
Neoamphitrite robusta							1					
Nephtys caeca												
Nephtys cornuta	6	21	13	14	28	22	2	8	13	22	1	
Nephtys ferruginea										2		
Nephtys sp.												
Nereidae												
Nereis procera			1	1								
Nereis sp.												
Nereis zonata												
Notomastus lobaricus										1		
Notomastus sp.												
Notomastus tenuis												
Odontosyllis phosphorea												
Onuphidae												
Onuphis elegans												
Ophelina acuminata												
Owenia fusiformis												
Paleanotus bellis												
Paranaitis polynoides												
Parandalia fauveli												
Paraonidae												
Paraprionospio pinnata		1	1	3	1			1	2	2		
Parougia caeca							1	11	4	4		
Pectinaria californiensis												
Pectinaria granulata												
Pectinaria sp.												
Petaloproctus tenuis borealis												
Pherusa plumosa							1	1				
Pholoe minuta												
Pholoides aspera												
Phyllochaetopterus prolifica												
Phyllodoce cuspidata												
Phyllodoce groenlandica												
Phyllodoce hartmanae									1			
Phyllodoce longipes					1	1						
Phyllodoce sp.				1								
Phyllodocidae												
Pilargis maculata												
Pista brevibranchiata							1			3		
Pista cristata												
Pista disjuncta	2	1	5	3		3	17	18	8	27		
Pista elongata												
Pista moorei												
Pista sp.												
Platynereis bicanaliculata		1						1				
Podarke pugettensis								3				
Podarkeopsis glabrus					1		1	2				1
Polycirrus sp. complex		1	3	2			7	14	1	2		
Polydora brachycephala												
Polydora cardalia	1		3		1	3	3	3		9		
Polydora cauleryi		1	1				1	1	1		1	
Polydora kempi												
Polydora limicola												
Polydora socialis	4	6	11	4	5	12	5	7	6	10		1
Polydora sp.												
Polynoidae									3	1		
Praxillella affinis pacifica							1					
Praxillella gracilis												
Praxillella praetermissa												
Praxillella sp.								1				
Prionospio lighti			2					2				
Prionospio multibranchiata			2					1		2		
Prionospio sp.												
Prionospio steenstrupi	1	4	7	2	6	1	21	19	13	20	1	5
Protodorvillea gracilis					1							
Pseudopotamilla intermedia												
Pseudopotamilla occelata												
Pseudopotamilla sp.										1		
Pterocirrus macroceros												
Raricirrus maculatus											2	
Rhodine bitorquata												
Sabellaria cementarium							1	1	1			

ANNELIDA	HY21I-4	HY21I-6	HY22I-1	HY22I-3	HY22I-5	HY22I-7	HY23I-1	HY23I-2	HY23I-4	HY23I-7	HY24I-1	HY24I-2
Sabellidae												
Scalibregma inflatum												
Schistocomus hiltoni												
Scoletoma luti	22	17	17	31	18	17	29	39	33	41		4
Sigambra tentaculata												
Sphaerodoropsis sphaerulifer												
Sphaerosyllis brandhorsti			2	1				2	2	1		
Spio filicornis												
Spiochaetopterus costarum				1			1	1				
Spionidae												
Spiophanes berkeleyorum	1						1	2	1	7		
Spiophanes sp.												
Sternaspis scutata												
Sthenelais tertiaglabra												
Streblosoma bairdi												
Syllis hartl												
Tenonia priops												
Terebellidae												
Terebellides californica		1										
Terebellides sp.												
Terebellides stroemi												
Thelepus setosus												
Trochochaeta multisetosa												
Oligochaeta												
Abundance	642	703	1025	752	1133	1289	558	965	759	1112	662	758
Richness												

ANNELIDA	HY24I-3	HY24I-4	HY25I-4	HY25I-5	HY25I-6	HY25I-7	HY26I-3	HY26I-5	HY26I-6	HY26I-7	HY27I-2	HY27I-3
Amage anops												
Ampharete acutifrons												
Ampharete finmarchica												
Ampharete labrops	1		1	1	3	2			2	1	2	2
Ampharete sp.												
Ampharetidae												
Amphicteis mucronata												
Anobothrus gracilis												
Aphelochaeta monilaris		2		2		1						
Aphelochaeta sp. C	8	19	11	11	43	48	71	36	104	120	38	32
Aphelochaeta spp.												
Arabellidae												
Aricidea lopezi												
Aricidea ramosa												
Armandia brevis												
Artacama coniferi												
Artacamella hancocki												
Asabellides lineata												
Asabellides sibirica												
Barantolla americana												
Boccardia pugettensis												
Boccardiella hamata				1					1		1	5
Capitella capitata	5	8	2	2					1			
Cauleriella sp. A												
Chaetozone acuta	567	550	493	670	577	743	296	167	280	250	199	193
Chaetozone setosa										1		
Chaetozone sp.												
Chirimia similis												
Cirratulidae												
Cirratulus cirratus			4	17	7	2	22	17	29	39	30	13
Cirratulus sp.												
Clymenura columbiana												
Cossura pygodactylata			3	6					1			
Cossura sp.	3											
Demonax medius												
Diopatra ornata												
Dorvillea rudolphi		2	1		2	2			5	1		
Drilonereis falcata minor												
Ehlersia heterochaeta												
Eteone californica												
Eteone longa												
Eteone sp.												
Eteone spilotus												
Euchone incolor				1								
Euchone limnicola	4	2	58	86	90	96	51	40	87	79	31	60
Euchone spp.												
Eudymene cf. zonalis												
Euclymeninae												
Eudistylia catherinae												
Eulalia bilineata												
Eulalia sanguinea											1	
Eusyllis habei												
Exogone molesta												
Galathowenia oculata												
Glycera americana						1					1	
Glycera nana	1		1	1	1							2
Glycera sp.												
Glycinde armigera												
Glycinde picta	1	2						1	1		2	1
Glycinde polygnatha						1				2		
Goniada brunnea												
Goniada maculata												
Gyptis brevipalpa												
Harmothoe imbricata												
Harmothoidae sp.												1
Heslonidae												
Heteromastus filobranchus				1		1						1
Heteromastus sp.												
Lanassa nordenskioeldi												
Lanassa venusta												
Laonice cirrata												
Laonice pugettensis												
Laonice spp.												
Leitoscoloplos pugettensis												
Lepidasthenia berkeleyae												
Lepidasthenia longicirrata												
Lepidonotus squamatus												
Levinsenia gracilis												
Lumbrineridae		1	3	6	7	4		1	10	5	4	5
Lumbrineris californiensis												
Lumbrineris cruzensis												
Magelona longicornis												
Magelona sp.												

ANNELIDA	HY24I-3	HY24I-4	HY25I-4	HY25I-5	HY25I-6	HY25I-7	HY26I-3	HY26I-5	HY26I-6	HY26I-7	HY27I-2	HY27I-3
Maldane sarsi												
Maldanidae												
Malmgreniella bansei												
Mediomastus ambiseta												
Mediomastus californiensis												
Mediomastus sp.		1			2	1						
Melinna oculata												
Mesochaetopterus taylori												
Microphthalmus sczelkowii												
Micropodarke dubia		6		1					1			
Neoamphitrite edwardsi												
Neoamphitrite robusta												
Nephtys caeca												
Nephtys cornuta		1			4	2	5	3	10	15		
Nephtys ferruginea	3			2	3		2		1		2	2
Nephtys sp.												
Nereidae												
Nereis procera	1											
Nereis sp.												
Nereis zonata												
Notomastus latericeus												
Notomastus sp.												
Notomastus tenuis												
Odontosyllis phosphorea												
Onuphidae												
Onuphis elegans												
Ophelina acuminata												
Owenia fusiformis												
Paleanotus bellis												
Paranaitis polynoides												
Parandalia fauveli												
Paraonidae												
Paraprionospio pinnata	1											
Parougia caeca												
Pectinaria californiensis												
Pectinaria granulata										1		
Pectinaria sp.												
Petaloproctus tenuis borealis												
Pherusa plumosa												
Pholoe minuta												
Pholoides aspera												
Phyllochaetopterus prolifica												
Phyllodoce cuspidata												
Phyllodoce groenlandica												
Phyllodoce hartmanae												
Phyllodoce longipes									1			
Phyllodoce sp.												
Phyllodocidae												
Pilargis maculata												
Pista brevibranchiata												
Pista cristata												
Pista disjuncta	1		1	1	1			1		1	2	3
Pista elongata												
Pista moorei												
Pista sp.												
Platynereis bicanaliculata	1											
Podarke pugettensis		2	1						1			
Podarkeopsis glabrus					1				1	1		
Polycirrus sp. complex							2					
Polydora brachycephala												
Polydora cardalia		1										
Polydora caulleryi	1	1								4	1	
Polydora kempi									1			
Polydora limicola												
Polydora socialis				1	2	1		1	1	1		1
Polydora sp.												
Polynoidae												
Praxillella affinis pacifica												
Praxillella gracilis												
Praxillella praetermissa												
Praxillella sp.												
Prionospio lighti		2					1	1				
Prionospio multibranchiata		1	1									
Prionospio sp.												
Prionospio steenstrupi	1	6		1	2	1		2	1		1	
Protodorvillea gracilis												
Pseudopotamilla intermedia												
Pseudopotamilla occelata												
Pseudopotamilla sp.												
Pterocirrus macroceros												
Raricirrus maculatus												
Rhodine bitorquata												
Sabellaria cementarium												

ANNELIDA	HY24I-3	HY24I-4	HY25I-4	HY25I-5	HY25I-6	HY25I-7	HY26I-3	HY26I-5	HY26I-6	HY26I-7	HY27I-2	HY27I-3
Sabellidae							1			1		
Scalibregma inflatum												
Schistocomus hiltoni												
Scoletoma luti	4	1	10	12	7	6	11	4	6	7	7	3
Sigambra tentaculata												
Sphaerodoropsis sphaerulifer												
Sphaerosyllis brandhorsti												
Spio filicornis												
Spiochaetopterus costarum	2		2	1	1	3		3		1		1
Spionidae												
Spiophanes berkeleyorum			2	1		1	3	1	2			2
Spiophanes sp.												
Stemaspis scutata												
Sthenelais tertiaglabra			1									
Streblosoma bairdi												
Syllis harti												
Tenonia priops												
Terebellidae												
Terebellides californica												
Terebellides sp.												
Terebellides stroemi												
Thelepus setosus												
Trochochaeta multisetosa												
Oligochaeta												
Abundance	605	608	595	825	753	916	465	278	547	530	322	327
Richness												

ANNELIDA	HY27I-6	HY27I-7	HY28I-3	HY28I-5	HY28I-6	HY28I-7	HY30I-1	HY30I-2	HY30I-5	HY30I-6	HY35I-1	HY35I-4
Amage anops												
Ampharete acutifrons												
Ampharete finmarchica	2											
Ampharete labrops					2	1						
Ampharete sp.												
Ampharetidae											1	
Amphicteis mucronata												
Anobothrus gracilis							3	2			12	4
Aphelochaeta monilaris			1	3		2	1	10	1	5	5	8
Aphelochaeta sp. C	79	10	10	57	26	40	641	504	440	394	284	175
Aphelochaeta spp.												
Arabellidae										1		
Aricidea lopezi												
Aricidea ramosa												
Armandia brevis									2		2	
Artacama coniferi											1	
Artacamella hancocki												
Asabellides lineata											1	5
Asabellides sibirica												
Barantolla americana			1			1						
Boccardia pugettensis								1	2	5		3
Boccardiella hamata							20		2			
Capitella capitata										1		
Caulleriella sp. A								2	5	4		
Chaetozone acuta	212	237	304	327	229	310	3	2	3	6	2	2
Chaetozone setosa			1			1	1	3		1	1	
Chaetozone sp.												
Chirimia similis											1	
Cirratulidae				1								
Cirratulus cirratus	32	14	118	75	68	63			1			3
Cirratulus sp.												
Clymenura columbiana												
Cossura pygodactylata						1	1	2				
Cossura sp.				1		1						
Demonax medius												
Diopatra ornata								1	1	1		
Dorvillea rudolphi				1	1	1			1			
Drilonereis falcata minor							1	1			2	1
Ehlersia heterochaeta												1
Eteone californica												
Eteone longa							1	2	5	4	22	8
Eteone sp.												
Eteone spilotus												
Euchone incolor			1	1								
Euchone limnicola	30	55	4	14	10	12			1			
Euchone spp.												
Euclymene cf. zonalis												
Eucymeninae												
Eudistylia catherinae												
Eulalia bilineata												
Eulalia sanguinea		1		1			3		3		3	4
Eusyllis habei												
Exogone molesta												
Galathowenia oculata												
Glycera americana				1		1				2		
Glycera nana					1		1			5	4	1
Glycera sp.												
Glycinde armigera												1
Glycinde picta		1	1		1	1			1		1	2
Glycinde polygnatha												
Goniada brunnea									1			
Goniada maculata												
Gyptis brevipalpa												
Harmothoe imbricata						1						
Harmotholdae sp.												
Hesionidae												
Heteromastus filobranchus								1				
Heteromastus sp.												
Lanassa nordenskioeldi								2				
Lanassa venusta												
Laonice cirrata												
Laonice pugettensis											3	
Laonice spp.												
Leitoscoloplos pugettensis							1	2	11	1	2	
Lepidasthenia berkeleyae												
Lepidasthenia longicirrata												
Lepidonotus squamatus												
Lavinsenia gracilis												
Lumbrineridae	8		2	8	4	3	23	42	8	145	15	15
Lumbrineris californiensis								13	6	1	13	
Lumbrineris cruzensis												
Magelona longicornis								1			17	6
Magelona sp.											1	3

ANNELIDA	HY27I-6	HY27I-7	HY28I-3	HY28I-5	HY28I-6	HY28I-7	HY30I-1	HY30I-2	HY30I-5	HY30I-6	HY35I-1	HY35I-4
Maldane sarsi											2	
Maldanidae							1				4	5
Malmgreniella bansei												
Mediomastus ambiseta												
Mediomastus californiensis							4	6	5			
Mediomastus sp.					1	1		5	5	3	44	25
Melinna oculata											1	
Mesochaetopterus taylori							1		1		1	7
Microphthalmus sczelkowii												1
Micropodarke dubia							2	2	2	1		
Neoamphitrite edwardsi												
Neoamphitrite robusta												
Nephtys caeca												
Nephtys comuta	1		1			1	6		4	2	4	
Nephtys ferruginea	1			1		2		1	5	2	1	2
Nephtys sp.												
Nereidae												
Nereis procera				1			1		2	1	1	1
Nereis sp.												
Nereis zonata												
Notomastus latericeus												
Notomastus sp.												
Notomastus tenuis							17	12	1	7	13	4
Odontosyllis phosphorea												
Onuphidae												
Onuphis elegans												1
Ophelina acuminata												
Owenia fusiformis								1				
Paleanotus bellis												
Paranaitis polynoides												
Parandalia fauveli											1	1
Paraonidae												
Paraprionospio pinnata						1				2	2	1
Parougia caeca				1	1	1						
Pectinaria californiensis				1		1						
Pectinaria granulata									3	2		
Pectinaria sp.												
Petaloproctus tenuis borealis												6
Pherusa plumosa								2				
Pholoe minuta												
Pholoides aspera							7	4	1			8
Phyllochaetopterus prolifica							4	2	4	2	20	0
Phyllodoce cuspidata											1	
Phyllodoce groenlandica							1				2	
Phyllodoce hartmanae				1			1	1	3	1	4	1
Phyllodoce longipes							1			1	4	2
Phyllodoce sp.												1
Phyllodocidae												
Pilargis maculata								1			1	
Pista brevibranchiata												
Pista cristata												
Pista disjuncta		1							2	2		1
Pista elongata												
Pista moorei												
Pista sp.												
Platynereis bicanaliculata								8	1	10	4	2
Podarke pugettensis					1		1	3	1			
Podarkeopsis glabrus			1								4	1
Polycirrus sp. complex							1	3	4	1		1
Polydora brachycephala								1	2	1	1	
Polydora cardalia								2		1		
Polydora caulleryi												3
Polydora kempi												
Polydora limicola							1	1			4	1
Polydora socialis						1	162	34	223	122	331	518
Polydora sp.								2		1		
Polynoidae												
Praxillella affinis pacifica												
Praxillella gracilis												
Praxillella praetermissa												
Praxillella sp.												
Prionospio lighti							4	5	1	1	11	6
Prionospio multibranchiata								4		2	1	1
Prionospio sp.							1					
Prionospio steenstrupi		1	1	1		1	36	57	45	36	56	67
Protodorvillea gracilis												
Pseudopotamilla intermedia								1				
Pseudopotamilla occelata												
Pseudopotamilla sp.												
Pterocirrus macroceros												
Raricirrus maculatus												
Rhodine bitorquata												3
Sabellaria cementarium											1	

ANNELIDA	HY27I-6	HY27I-7	HY28I-3	HY28I-5	HY28I-6	HY28I-7	HY30I-1	HY30I-2	HY30I-5	HY30I-6	HY35I-1	HY35I-4
Sabellidae	4											
Scalibregma inflatum									1			
Schistocomus hiltoni												
Scoletoma luti		10	5	8	6	8	2		1	1	8	6
Sigambra tentaculata												
Sphaerodoropsis ophaerulifor												1
Sphaerosyllis brandhorsti											1	1
Spio filicornis												
Spiochaetopterus costarum	1	3	1	1		1	15	11	16	5	48	63
Spionidae												
Spiophanes berkeleyorum	3			2		1	1	2	4	2	4	9
Spiophanes sp.												
Sternaspis scutata												
Sthenelais tertiaglabra								1	1	1		
Streblosoma bairdi												
Syllis harti												1
Tenonia priops									1	1	1	2
Terebellidae								1			2	
Terebellides californica												3
Terebellides sp.												
Terebellides stroemi												
Thelepus setosus												
Trochochaeta multisetosa												
Oligochaeta								1		2	3	2
Abundance	373	333	452	507	351	458	970	763	831	789	988	1003
Richness												

ANNELIDA	HY35I-5	HY35I-7	CR2I-1	CR2I-4	CR2I-5	CR2I-7	CR2AI-1	CR2AI-2	CR2AI-3	CR2AI-4	Total HY1I	Total HY2I
Amage anops											1	5
Ampharete acutifrons											0	11
Ampharete finmarchica	1										17	7
Ampharete labrops				2							0	0
Ampharete sp.				2		1					0	0
Ampharetidae		1									0	0
Amphicteis mucronata											0	1
Anobothrus gracilis		5									8	4
Aphelochaeta monilaris	4	8	1								21	12
Aphelochaeta sp. C	260	257	25	33	27	34					915	1189
Aphelochaeta spp.											0	0
Arabellidae											0	0
Aricidea lopezi											0	0
Aricidea ramosa					1						0	0
Armandia brevis											0	0
Artacama coniferi				1							1	0
Artacamella hancocki											0	0
Asabellides lineata	7										3	45
Asabellides sibirica											0	1
Barantolla americana											0	1
Boccardia pugettensis	5										0	4
Boccardiella hamata											410	1
Capitella capitata	1			1							0	2
Cauleriella sp. A											0	0
Chaetozone acuta	1	4					2	1		1	4	1
Chaetozone setosa	1	1									11	1
Chaetozone sp.											0	0
Chirimia similis											0	0
Cirratulidae											0	2
Cirratulus cirratus	1	2									2	4
Cirratulus sp.											0	0
Glyphohesione complanata											0	1
Cossura pygodactylata							1		1		0	0
Cossura sp.											0	0
Demonax medius											0	0
Diopatra ornata											0	0
Dorvillea rudolphi											0	0
Drilonereis falcata minor	1	1									2	0
Ehlersia heterochaeta											1	0
Eteone californica											0	1
Eteone longa		9	1			2					1	0
Eteone sp.	11		2								0	0
Eteone spilotus											0	0
Euchone incolor		1									2	1
Euchone limnicola											0	0
Euchone spp.											0	0
Eudymene cf. zonalis			1								0	0
Eulymeninae				7		1					2	0
Eudistylia catherinae											0	0
Eulalia bilineata	1	1									0	0
Eulalia sanguinea	6	3									9	1
Eusyllis habei		2									0	0
Exogone molesta											0	0
Galathowenia oculata											0	0
Glycera americana		1				1					1	0
Glycera nana	3	1	2	3	3	6	2	4	5	2	11	10
Glycera sp.											0	0
Glycinde armigera	1		9	5	5	12			1		0	0
Glycinde picta						1	1			1	1	1
Glycinde polygnatha											0	0
Goniada brunnea											2	10
Goniada maculata										1	0	0
Gyptis brevipalpa											0	0
Harmothoe imbricata		3									0	0
Harmotholdae sp.											0	0
Hesionidae						1					0	0
Heteromastus filobranchus					1						0	0
Heteromastus sp.											0	0
Lanassa nordenskioeldi						1					46	9
Lanassa venusta											2	0
Laonice cirrata		2							2	1	0	0
Laonice pugettensis		2									0	0
Laonice spp.											1	0
Leitoscoloplos pugettensis			23	11	16	8		1			0	10
Lepidasthenia berkeleyae	1				1		3	1	1	2	0	0
Lepidasthenia longicirrata											1	0
Lepidonotus squamatus											0	0
Levinsenia gracilis			3		1		7	1	5	12	7	0
Lumbrineridae	26	24	17	25	11	29	1	1			31	57
Lumbrineris californiensis			8	9	1	3					5	8
Lumbrineris cruzensis		4					9	7	9	9	3	2
Magelona longicornis	7	2	2	7	2	2					17	8
Magelona sp.		2		1	1	2					0	0

ANNELIDA	HY35I-5	HY35I-7	CR2I-1	CR2I-4	CR2I-5	CR2I-7	CR2AI-1	CR2AI-2	CR2AI-3	CR2AI-4	Total HY1I	Total HY2I
Maldane sarsi											0	0
Maldanidae	2	1	2	7	6	2	1				4	0
Malmgreniella bansei											0	0
Mediomastus ambiseta								1	4	1	0	0
Mediomastus californiensis			11	16	14						1	0
Mediomastus sp.	22	00				19					0	0
Melinna oculata			2	1							2	0
Mesochaetopterus taylori	2	3	3	5	3	3					4	7
Microphthalmus sczelkowii	1	1									0	0
Micropodarke dubia	1	2			1						0	0
Neoamphitrite edwardsi											0	1
Neoamphitrite robusta											1	0
Nephtys caeca								1			0	0
Nephtys cornuta	1	4	4		1	1	2	2	2	2	2	2
Nephtys ferruginea	4	4	1			1				2	17	0
Nephtys sp.	2			1							1	1
Nereidae											1	0
Nereis procera	2			1							6	2
Nereis sp.											0	0
Nereis zonata											0	0
Notomastus latericeus	1		2			2					0	0
Notomastus sp.											0	0
Notomastus tenuis	6	6	1	2	4						118	31
Odontosyllis phosphorea	1										1	0
Onuphidae											0	0
Onuphis elegans	1			1		1					0	0
Ophelina acuminata											1	1
Owenia fusiformis											0	0
Paleanotus bellis		1		1							0	0
Paranaitis polynoides											0	0
Parandalia fauveli	1	1									0	0
Paraonidae											0	0
Paraprionospio pinnata	1	1	1	2	1		1	1	1		2	5
Parougia caeca											0	0
Pectinaria californiensis			7	8	14	13			1		2	1
Pectinaria granulata											8	31
Pectinaria sp.			6	9		22		1			0	0
Petaloproctus tenuis borealis	1	11									0	0
Pherusa plumosa											0	0
Pholoe minuta	1		4	5	12	15	7	12	9	5	0	0
Pholoides aspera	6	7									1	10
Phyllochaetopterus prolifica	10	6		1		2					0	1
Phyllodoce cuspidata											0	0
Phyllodoce groenlandica											0	0
Phyllodoce hartmanae	2										3	3
Phyllodoce longipes	2	2		1							7	1
Phyllodoce sp.	3	1									6	0
Phyllodocidae											0	0
Pilargis maculata	1		4	3	7	6	1	1	1		1	0
Pista brevibranchiata											5	0
Pista cristata											0	0
Pista disjuncta				5		2					7	2
Pista elongata											1	0
Pista moorei											0	0
Pista sp.		1									1	0
Platynereis bicanaliculata		26									0	2
Podarke pugettensis	1	2									0	0
Podarkeopsis glabrus				2		1					0	0
Polycirrus sp. complex	4	4			2						23	27
Polydora brachycephala		1									2	2
Polydora cardalia	4										0	4
Polydora cauleryi	4	2									3	3
Polydora kempi											0	0
Polydora limicola											1	4
Polydora socialis	392	250		1		1					84	106
Polydora sp.											0	1
Polynoidae			1			1					1	0
Praxillella affinis pacifica					1		5	3	1	3	5	0
Praxillella gracilis											6	1
Praxillella praetermissa											0	2
Praxillella sp.				6		1					0	0
Prionospio lighti	4	8	6	13	4	22	30	6	15	38	4	0
Prionospio multibranchiata	1	1									0	2
Prionospio sp.											0	0
Prionospio steenstrupi	79	99	35	61	43	78	4	6	6	10	32	20
Protodorvillea gracilis											0	0
Pseudopotamilla intermedia											0	0
Pseudopotamilla occelata											0	0
Pseudopotamilla sp.											0	0
Pterocirrus macroceros											0	0
Raricirrus maculatus											0	0
Rhodine bitorquata	2										2	0
Sabellaria cementarium	1										0	1

ANNELIDA	HY35I-5	HY35I-7	CR2I-1	CR2I-4	CR2I-5	CR2I-7	CR2AI-1	CR2AI-2	CR2AI-3	CR2AI-4	Total HY1I	Total HY2I
Sabellidae											0	0
Scalibregma inflatum											0	1
Schistocomus hiltoni											0	0
Scoletoma luti	8	5	42	43	31	40					77	70
Sigambra tentaculata			2	3		5	10	14	21	10	0	0
Sphaerodoropsis sphaerulifer			1	1		1					0	0
Sphaerosyllis brandhorsti											0	0
Spio filicornis		1									0	0
Spiochaetopterus costarum	48	34	9	5	2	9			2	1	63	28
Spionidae		3									0	0
Spiophanes berkeleyorum	3	6		1			2	2			11	1
Spiophanes sp.											0	0
Sternaspis scutata											1	0
Sthenelais tertiaglabra	1			1			1			1	3	0
Streblosoma bairdi											0	0
Syllis harti	2										0	0
Tenonia priops	2		1	1							2	0
Terebellidae		1									1	1
Terebellides californica	3	1	3	2		7	2			1	0	0
Terebellides sp.				1							0	1
Terebellides stroemi											0	0
Thelepus setosus					2						0	0
Trochochaeta multisetosa											0	0
Oligochaeta	2	6	3	12	2	18	57	78	177	136	0	0
Abundance	982	870	245	329	220	377	149	144	264	239		
Richness											73	64

ANNELIDA	Total HY3I	Total HY4I	Total HY5I	Total HY6I	Total HY7I	Total HY8I	Total HY9I	Total HY10I	Total HY11I
Amage anops	15	0	1	1	3	0	1	0	0
Ampharete acutifrons	6	4	3	7	2	0	0	0	0
Ampharete finmarchica	16	4	0	0	2	0	0	0	0
Ampharete labrops	6	2	1	1	0	1	0	1	0
Ampharete sp.	1	0	0	0	0	0	0	0	0
Ampharetidae	1	0	0	2	0	0	2	0	0
Amphicteis mucronata	0	0	0	0	0	0	0	0	0
Anobothrus gracilis	2	1	5	1	0	0	0	0	0
Aphelochaeta monilaris	70	13	77	7	45	16	1	14	5
Aphelochaeta sp. C	1452	1096	1906	892	1259	765	608	929	61
Aphelochaeta spp.	0	0	0	0	0	0	0	0	4
Arabellidae	0	0	0	0	0	0	0	0	0
Aricidea lopezi	0	0	1	0	0	1	0	0	0
Aricidea ramosa	0	0	0	0	0	0	0	0	0
Armandia brevis	0	0	0	0	0	0	0	0	0
Artacama coniferi	0	0	3	0	0	0	1	0	0
Artacamella hancocki	0	1	0	0	0	0	0	0	0
Asabellides lineata	53	6	0	4	4	0	0	0	1
Asabellides sibirica	0	0	0	0	0	0	0	0	0
Barantolia americana	0	0	5	10	2	0	0	0	0
Boccardia pugettensis	0	14	4	0	1	0	0	0	0
Boccardiella hamata	17	4	1	0	6	4	0	0	0
Capitella capitata	6	1	3	7	0	1	7	2	0
Caulleriella sp. A	0	0	0	0	0	0	1	0	0
Chaetozone acuta	10	0	2	3	1	3	1	0	0
Chaetozone setosa	34	16	23	16	10	25	0	12	10
Chaetozone sp.	0	0	0	0	0	0	0	0	0
Chirimia similis	0	0	0	0	0	0	0	0	0
Cirratulidae	0	0	0	0	2	0	0	279	566
Cirratulus cirratus	17	3	1	2	0	0	0	0	0
Cirratulus sp.	0	0	0	0	0	0	0	0	0
Glyphenura columbiana	1	0	0	0	0	0	0	0	0
Cossura pygodactylata	0	0	7	3	1	3	3	0	0
Cossura sp.	6	0	0	0	2	0	0	11	1
Demonax medius	1	0	0	0	0	0	0	0	0
Diopatra ornata	1	2	1	1	0	0	0	0	1
Dorvillea rudolphi	0	0	0	0	0	0	0	0	0
Drilonereis falcata minor	0	0	0	0	1	0	0	0	0
Ehlersia heterochaeta	0	0	0	0	0	0	0	0	0
Eteone californica	0	0	0	0	0	0	0	0	0
Eteone longa	1	0	1	0	2	0	0	0	0
Eteone sp.	0	0	0	0	0	0	0	0	0
Eteone spilotus	0	0	0	0	0	0	0	0	0
Euchone incolor	3	3	4	20	5	2	0	0	0
Euchone limnicola	1	3	0	0	4	2	0	0	0
Euchone spp.	0	0	0	0	0	0	0	0	0
Eudymene cf. zonalis	0	0	0	0	0	0	0	0	0
Eudymeninae	0	0	0	0	0	0	0	0	0
Eudistylia catherinae	0	0	0	0	0	0	0	0	0
Eulalia bilineata	0	0	0	0	0	0	0	0	0
Eulalia sanguinea	4	0	2	0	0	0	0	0	0
Eusyllis habei	0	0	0	0	0	0	0	0	0
Exogone molesta	0	0	0	0	0	0	0	0	0
Galathowenia oculata	1	0	0	0	0	0	0	0	0
Glycera americana	0	0	1	1	0	0	0	0	0
Glycera nana	7	3	13	1	4	4	2	0	2
Glycera sp.	0	0	0	1	0	0	0	0	0
Glycinde armigera	1	0	0	0	0	0	0	0	0
Glycinde picta	4	0	3	3	1	4	1	0	4
Glycinde polygnatha	0	0	0	0	0	0	0	0	1
Goniada brunnea	4	0	0	1	2	0	0	0	1
Goniada maculata	0	0	0	0	0	0	0	0	0
Gyptis brevipalpa	0	0	0	0	0	0	0	0	0
Harmothoe imbricata	0	0	0	0	0	0	0	0	0
Harmothoidae sp.	0	0	0	0	0	0	0	0	0
Hesionidae	0	0	0	0	0	0	0	0	0
Heteromastus filobranchus	1	2	3	0	0	1	0	0	0
Heteromastus sp.	0	2	0	0	0	0	0	0	0
Lanassa nordenskioeldi	14	4	7	14	8	0	5	0	0
Lanassa venusta	0	0	0	0	0	1	0	0	0
Laonice cirrata	0	0	0	1	1	0	1	0	0
Laonice pugettensis	0	0	0	0	0	0	0	0	0
Laonice spp.	0	0	0	0	0	0	0	0	0
Leitoscoloplos pugettensis	2	3	4	2	6	1	0	1	2
Lepidasthenia berkeleyae	0	1	0	0	0	0	0	0	0
Lepidasthenia longicirrata	0	0	0	0	0	0	0	0	0
Lepidonotus squamatus	1	0	1	0	0	0	0	0	0
Levinsenia gracilis	0	0	1	0	1	1	1	2	1
Lumbrineridae	39	14	52	43	51	20	88	60	47
Lumbrineris californiensis	26	14	23	0	1	2	0	0	0
Lumbrineris cruzensis	0	0	0	0	0	0	0	0	0
Magelona longicornis	17	10	7	6	5	12	0	0	0
Magelona sp.	0	0	0	0	0	0	0	0	0

ANNELIDA	Total HY3I	Total HY4I	Total HY5I	Total HY6I	Total HY7I	Total HY8I	Total HY9I	Total HY10I	Total HY11I
Maldane sarsi	0	0	0	0	0	0	0	0	0
Maldanidae	0	1	1	0	0	1	0	0	1
Malmgreniella bansei	2	0	0	1	0	0	0	0	0
Mediomastus ambiseta	0	2	0	0	0	0	0	0	0
Mediomastus californiensis	4	0	10	0	0	2	0	0	0
Mediomastus sp.	4	2	6	1	3	1	2	0	1
Melinna oculata	2	1	0	1	1	0	1	0	0
Mesochaetopterus taylori	3	0	3	3	6	0	0	0	0
Microphthalmus sczelkowii	0	0	0	0	0	0	0	0	0
Micropodarke dubia	0	0	0	2	0	0	0	0	0
Neoamphitrite edwardsi	0	0	0	0	0	0	0	0	0
Neoamphitrite robusta	0	0	0	0	0	0	0	0	0
Nephtys caeca	0	0	0	0	0	0	0	0	0
Nephtys cornuta	6	0	5	11	1	2	50	24	4
Nephtys ferruginea	10	5	3	4	1	0	3	0	0
Nephtys sp.	0	1	10	0	0	0	0	0	0
Nereidae	0	0	0	0	0	0	0	0	0
Nereis procera	5	1	1	2	3	0	0	0	0
Nereis sp.	1	0	0	0	0	0	0	0	0
Nereis zonata	3	0	0	0	0	0	0	0	0
Notomastus latericeus	0	0	1	0	0	0	0	0	0
Notomastus sp.	0	0	0	0	0	0	0	12	1
Notomastus tenuis	18	34	59	4	18	15	0	0	1
Odontosyllis phosphorea	0	0	0	0	0	0	0	0	0
Onuphidae	1	0	0	0	0	0	1	0	0
Onuphis elegans	2	0	1	0	0	0	0	0	0
Ophelina acuminata	0	0	0	0	0	0	13	0	0
Owenia fusiformis	0	0	0	0	0	0	0	0	0
Paleanotus bellis	0	0	0	1	0	0	0	0	0
Paranaitis polynoides	1	0	0	0	0	0	0	0	0
Parandalia fauveli	0	0	0	0	0	0	0	0	0
Paraonidae	0	0	0	0	0	0	0	0	0
Paraprionospio pinnata	7	5	2	3	4	6	0	4	2
Parougia caeca	0	0	1	0	0	0	0	0	0
Pectinaria californiensis	3	1	0	0	0	0	0	0	0
Pectinaria granulata	21	1	1	3	0	0	0	0	0
Pectinaria sp.	0	0	0	0	0	0	0	0	0
Petaloproctus tenuis borealis	0	0	0	0	0	0	0	0	0
Pherusa plumosa	0	0	0	0	0	0	0	0	0
Pholoe minuta	1	0	1	0	0	0	0	0	0
Pholoides aspera	5	0	1	2	0	0	2	0	0
Phyllochaetopterus prolifica	0	0	2	1	0	4	0	0	0
Phyllodoce cuspidata	0	0	0	0	0	0	0	0	0
Phyllodoce groenlandica	0	0	0	0	0	0	0	0	0
Phyllodoce hartmanae	4	2	7	2	1	6	1	0	0
Phyllodoce longipes	0	0	0	0	0	0	0	0	0
Phyllodoce sp.	1	1	0	1	0	0	0	0	0
Phyllodocidae	1	0	0	0	0	0	0	0	0
Pilargis maculata	0	2	0	0	0	0	0	2	0
Pista brevibranchiata	0	0	0	2	0	0	0	0	0
Pista cristata	1	0	0	0	0	0	0	1	0
Pista disjuncta	13	2	3	2	4	1	1	0	0
Pista elongata	0	0	0	0	0	0	0	0	0
Pista moorei	4	0	0	0	0	0	0	0	0
Pista sp.	3	0	0	0	0	0	0	0	1
Platynereis bicanaliculata	2	0	5	2	2	0	0	0	2
Podarke pugettensis	4	0	2	3	1	1	2	0	0
Podarkeopsis glabrus	0	0	0	0	0	0	0	0	0
Polycirrus sp. complex	41	12	10	13	11	1	6	0	0
Polydora brachycephala	3	0	6	3	3	1	4	0	0
Polydora cardalia	0	0	4	0	2	0	1	0	0
Polydora cauleryi	3	1	4	1	0	3	0	0	0
Polydora kempi	0	0	0	0	0	0	0	0	0
Polydora limicola	3	1	1	1	1	0	1	0	0
Polydora socialis	140	93	324	59	122	105	12	45	19
Polydora sp.	0	0	0	1	0	0	0	9	0
Polynoidae	2	0	1	1	1	0	1	0	0
Praxillella affinis pacifica	0	0	0	0	0	0	0	0	0
Praxillella gracilis	2	0	0	0	0	0	0	0	0
Praxillella praetermissa	0	0	0	0	0	0	0	0	0
Praxillella sp.	0	0	0	0	0	0	0	0	0
Prionospio lighti	0	1	0	1	0	2	0	0	0
Prionospio multibranchiata	2	0	0	0	0	0	0	0	0
Prionospio sp.	0	0	0	1	0	0	0	0	0
Prionospio steenstrupi	9	27	68	63	29	22	13	38	10
Protodorvillea gracilis	0	0	0	0	0	0	0	0	0
Pseudopotamilla intermedia	0	0	0	0	0	0	0	0	0
Pseudopotamilla occelata	0	0	0	0	0	0	0	0	0
Pseudopotamilla sp.	0	0	1	0	0	0	0	0	0
Pterocirrus macroceros	1	0	0	0	0	0	0	0	0
Rarilcirrus maculatus	0	0	0	0	0	0	0	0	0
Rhodine bitorquata	0	0	0	1	0	0	0	0	0
Sabellaria cementarium	12	1	1	0	0	0	0	0	0

ANNELIDA	Total HY3I	Total HY4I	Total HY5I	Total HY6I	Total HY7I	Total HY8I	Total HY9I	Total HY10I	Total HY11I
Sabellidae	3	0	0	1	0	0	0	0	0
Scalibregma inflatum	0	0	0	0	0	0	0	0	0
Schistocomus hiltoni	3	0	0	0	0	0	0	0	0
Scoletoma luti	124	56	110	25	42	89	4	15	30
Sigambra tentaculata	0	0	0	0	0	0	0	0	0
Sphaerodoropolo sphaerulifer	0	0	1	0	0	0	1	0	1
Sphaerosyllis brandhorsti	0	0	1	0	0	0	1	0	0
Spio filicornis	0	0	0	0	0	0	0	0	0
Spiochaetopterus costarum	51	13	18	10	10	15	1	7	2
Spionidae	0	0	0	0	0	0	0	0	0
Spiophanes berkeleyorum	1	1	11	4	2	4	0	0	0
Spiophanes sp.	0	0	0	0	0	0	0	6	0
Sternaspis scutata	0	0	0	0	0	1	0	2	1
Sthenelais tertiaglabra	3	0	0	0	1	0	1	0	0
Streblosoma bairdi	0	1	0	0	0	0	0	0	0
Syllis harti	0	0	0	0	0	0	0	0	0
Tenonia priops	0	0	0	1	0	0	0	0	0
Terebellidae	4	1	1	0	0	0	2	0	0
Terebellides californica	0	0	3	0	0	0	10	0	0
Terebellides sp.	0	0	0	0	0	0	0	0	0
Terebellides stroemi	0	0	0	0	0	0	0	1	3
Thelepus setosus	0	0	0	0	0	0	0	0	0
Trochochaeta multisetosa	0	0	0	0	0	0	1	0	0
Oligochaeta	0	0	0	0	0	0	1	0	0
Abundance									
Richness	83	52	69	62	51	40	41	23	30

ANNELIDA	Total HY12I	Total HY13I	Total HY14I	Total HY15I	Total HY16I	Total HY17I	Total HY18I	Total HY19I	Total HY20I
Amage anops	1	0	0	1	0	0	0	1	1
Ampharete acutifrons	0	0	0	0	0	1	0	0	1
Ampharete finmarchica	0	0	0	0	0	0	3	0	2
Ampharete labrops	0	2	2	0	0	1	2	7	1
Ampharete sp.	0	0	0	0	0	0	1	0	0
Ampharetidae	0	0	1	0	0	1	0	0	0
Amphicteis mucronata	0	0	0	0	0	0	0	0	0
Anobothrus gracilis	0	0	0	0	0	0	0	1	0
Aphelochaeta monilaris	62	1	3	36	23	0	60	89	47
Aphelochaeta sp. C	845	252	1385	489	869	115	1437	1633	1399
Aphelochaeta spp.	0	0	0	0	0	0	0	0	0
Arabellidae	0	0	0	0	0	0	0	0	0
Aricidea lopezi	1	0	1	0	0	0	0	3	1
Aricidea ramosa	0	0	0	0	0	0	0	0	0
Armandia brevis	0	0	0	0	0	2	0	0	0
Artacama coniferi	1	0	1	0	0	0	0	2	2
Artacamella hancocki	0	0	0	0	0	0	0	0	0
Asabellides lineata	0	1	0	0	0	0	0	0	0
Asabellides sibirica	0	0	0	0	0	0	0	0	0
Barantolla americana	1	0	0	0	0	0	0	0	0
Boccardia pugettensis	1	0	0	0	0	0	0	0	0
Boccardiella hamata	0	0	0	0	0	0	1	0	0
Capitella capitata	2	14	26	0	1	4	0	2	0
Cauleriella sp. A	0	1	0	0	0	0	0	0	0
Chaetozone acuta	0	36	111	0	0	122	18	9	0
Chaetozone setosa	59	1	12	32	35	0	8	34	28
Chaetozone sp.	0	0	0	0	18	0	0	0	0
Chirimia similis	0	0	0	0	0	0	0	0	0
Cirratulidae	0	0	0	0	159	0	0	0	0
Cirratulus cirratus	1	0	0	0	0	1	0	2	36
Cirratulus sp.	0	0	0	0	2	0	0	0	0
Clymenura columbiana	0	0	0	0	0	0	0	0	0
Cossura pygodactylata	4	9	68	0	0	6	31	118	27
Cossura sp.	0	0	0	39	37	0	0	0	0
Demonax medius	0	0	0	0	0	0	0	0	0
Diopatra ornata	1	1	0	0	0	0	0	0	0
Dorvillea rudolphi	0	0	1	0	0	0	0	0	0
Drilonereis falcata minor	0	0	0	0	0	0	0	0	0
Ehlersia heterochaeta	0	0	0	0	0	0	0	0	0
Eteone californica	0	0	0	0	0	0	0	0	0
Eteone longa	0	0	1	0	0	1	0	3	0
Eteone sp.	0	0	0	0	0	0	0	0	0
Eteone spilotus	0	0	0	0	0	0	0	0	1
Euchone incolor	4	7	43	0	0	4	74	68	21
Euchone limnicola	0	4	24	0	0	32	54	81	77
Euchone spp.	0	0	0	3	15	0	0	0	0
Eudymene cf. zonalis	0	0	0	0	0	0	0	0	0
Euclymeninae	0	0	0	0	0	0	0	0	0
Eudistylia catherinae	0	0	0	0	0	0	0	0	0
Eulalia bilineata	0	0	0	0	0	0	0	0	0
Eulalia sanguinea	1	1	0	0	0	0	1	1	0
Eusyllis habei	0	1	0	0	0	0	0	0	0
Exogone molesta	0	0	0	0	0	0	0	0	0
Galathowenia oculata	0	0	0	0	0	0	0	0	0
Glycera americana	0	0	0	0	1	0	0	0	0
Glycera nana	2	1	2	0	2	1	2	1	2
Glycera sp.	0	0	0	0	0	0	0	0	0
Glycinde armigera	1	0	0	0	0	0	1	0	0
Glycinde picta	1	2	4	1	1	1	1	1	3
Glycinde polygnatha	0	0	0	0	0	0	0	0	0
Goniada brunnea	0	0	0	0	0	0	0	0	0
Goniada maculata	0	0	0	0	0	0	0	0	0
Gyptis brevipalpa	0	0	0	1	0	0	0	0	0
Harmothoe imbricata	0	0	0	0	0	0	0	0	0
Harmothoidae sp.	0	0	0	0	0	0	0	0	0
Hesionidae	0	0	0	0	0	0	0	0	0
Heteromastus filobranchus	0	1	0	0	2	0	1	3	1
Heteromastus sp.	0	0	0	2	0	0	0	0	1
Lanassa nordenskioeldi	7	2	3	0	0	0	10	10	1
Lanassa venusta	0	0	0	0	0	0	0	0	2
Laonice cirrata	0	1	0	0	0	0	0	0	0
Laonice pugettensis	0	0	0	0	0	0	0	0	0
Laonice spp.	0	0	0	0	0	0	0	0	0
Leitoscoloplos pugettensis	2	0	1	0	0	0	1	1	0
Lepidasthenia berkeleyae	0	0	0	0	0	0	0	0	0
Lepidasthenia longicirrata	1	0	0	0	0	0	0	0	0
Lepidonotus squamatus	0	0	0	0	0	0	0	0	0
Levinsenia gracilis	0	0	0	0	1	0	0	1	0
Lumbrineridae	13	28	65	70	57	3	31	39	7
Lumbrineris californiensis	1	3	1	0	0	0	0	1	1
Lumbrineris cruzensis	0	0	0	0	0	0	5	0	0
Magelona longicornis	1	0	0	0	0	0	0	0	0
Magelona sp.	0	0	0	0	0	0	0	0	0

ANNELIDA	Total HY12I	Total HY13I	Total HY14I	Total HY15I	Total HY16I	Total HY17I	Total HY18I	Total HY19I	Total HY20I
Maldane sarsi	0	0	0	0	0	0	0	0	0
Maldanidae	0	0	1	0	0	0	0	0	0
Malmgreniella bansei	0	0	0	0	0	0	0	3	1
Mediomastus ambiseta	0	0	0	0	0	0	0	0	0
Mediomastus californiensis	4	0	1	0	0	0	0	0	0
Mediomastus sp.	0	3	7	0	0	1	3	1	0
Melinna oculata	0	0	0	0	0	0	0	0	0
Mesochaetopterus taylori	1	0	0	0	0	0	0	0	0
Microphthalmus sczelkowii	0	0	0	0	0	0	0	0	0
Micropodarke dubia	0	0	0	0	0	2	1	7	0
Neoamphitrite edwardsi	1	0	0	0	0	0	0	0	0
Neoamphitrite robusta	0	0	0	0	0	0	0	0	0
Nephtys caeca	0	0	0	0	0	0	0	0	0
Nephtys cornuta	19	4	6	24	21	19	67	152	24
Nephtys ferruginea	3	3	1	1	0	2	0	4	3
Nephtys sp.	0	0	0	0	0	0	0	0	0
Nereidae	0	0	0	0	0	0	0	0	0
Nereis procera	0	1	1	0	0	0	0	0	0
Nereis sp.	0	0	0	0	0	0	0	0	0
Nereis zonata	0	0	0	0	0	0	0	0	0
Notomastus latericeus	1	0	0	0	0	0	0	0	0
Notomastus sp.	0	0	0	5	0	0	0	0	0
Notomastus tenuis	12	0	0	0	0	0	0	1	1
Odontosyllis phosphorea	0	0	0	0	0	0	0	0	0
Onuphidae	0	0	0	0	0	0	0	0	0
Onuphis elegans	0	0	0	0	0	0	0	0	0
Ophelina acuminata	1	1	0	0	0	0	0	0	0
Owenia fusiformis	0	0	0	0	0	0	0	0	0
Paleanotus bellis	0	0	0	0	0	0	0	0	0
Paranaitis polynoides	0	0	0	0	0	0	0	1	0
Parandalia fauveli	0	0	0	0	0	0	0	0	0
Paraonidae	0	0	0	0	0	1	0	1	0
Paraprionospio pinnata	3	4	5	2	4	6	4	6	2
Parougia caeca	0	0	0	0	0	0	0	2	0
Pectinaria californiensis	0	0	0	0	0	0	1	0	1
Pectinaria granulata	0	0	0	0	0	0	0	0	0
Pectinaria sp.	0	0	0	0	0	0	0	0	0
Petaloproctus tenuis borealis	0	0	0	0	0	0	0	0	0
Pherusa plumosa	0	0	0	0	0	0	0	0	0
Pholoe minuta	0	0	0	2	1	0	0	0	0
Pholoides aspera	1	1	0	0	0	0	0	0	0
Phyllochaetopterus prolifica	4	0	0	0	0	0	0	0	0
Phyllodoce cuspidata	1	0	0	0	0	0	0	0	0
Phyllodoce groenlandica	0	0	0	0	0	0	0	0	0
Phyllodoce hartmanae	0	0	3	0	0	1	2	1	0
Phyllodoce longipes	0	1	0	0	0	0	1	1	0
Phyllodoce sp.	0	0	0	0	0	0	0	0	0
Phyllodocidae	0	0	0	0	0	0	0	0	0
Pliargis maculata	0	0	0	0	0	0	0	0	0
Pista brevibranchiata	0	0	2	0	0	0	0	0	0
Pista cristata	0	0	0	0	0	0	0	0	0
Pista disjuncta	9	2	1	0	0	0	1	0	1
Pista elongata	0	0	0	0	0	0	0	0	0
Pista moorei	0	0	0	0	0	0	0	0	0
Pista sp.	0	1	0	1	0	0	0	0	0
Platynereis bicanaliculata	0	0	0	0	0	0	0	0	0
Podarke pugettensis	1	0	0	0	0	1	0	1	1
Podarkeopsis glabrus	0	2	1	0	0	0	1	2	0
Polycirrus sp. complex	14	0	5	0	0	0	5	7	1
Polydora brachycephala	3	0	2	0	0	0	0	0	0
Polydora cardalia	1	0	1	0	0	0	9	0	0
Polydora cauleryi	1	0	0	0	0	0	2	0	0
Polydora kempi	0	0	0	0	0	0	0	0	0
Polydora limicola	0	0	0	0	0	0	0	0	0
Polydora socialis	88	20	43	26	29	17	29	22	21
Polydora sp.	0	2	0	3	9	1	3	0	1
Polynoidae	0	0	0	0	0	0	2	0	0
Praxillella affinis pacifica	0	0	0	0	0	0	0	0	0
Praxillella gracilis	0	0	0	0	0	0	0	0	0
Praxillella praetermissa	0	0	0	0	0	0	0	0	0
Praxillella sp.	0	0	0	0	0	0	0	0	0
Prionospio lighti	0	1	2	0	0	1	1	2	1
Prionospio multibranchiata	0	0	0	0	0	0	0	0	0
Prionospio sp.	0	0	0	0	0	0	0	0	0
Prionospio steenstrupi	28	52	29	7	11	24	15	9	2
Protodorvillea gracilis	0	0	0	0	0	0	0	0	0
Pseudopotamilla intermedia	0	0	0	0	0	0	0	2	0
Pseudopotamilla occelata	0	0	0	0	0	0	0	0	0
Pseudopotamilla sp.	0	0	0	0	0	0	0	0	0
Pterocirrus macroceros	0	0	0	0	0	0	0	0	0
Ramicirrus maculatus	0	0	0	0	0	0	0	0	0
Rhodine bitorquata	0	0	0	0	0	0	0	0	0
Sabellaria cementarium	1	0	0	0	0	0	0	0	0

ANNELIDA	Total HY12I	Total HY13I	Total HY14I	Total HY15I	Total HY16I	Total HY17I	Total HY18I	Total HY19I	Total HY20I
Sabellidae	0	0	0	0	6	0	0	5	0
Scalibregma inflatum	0	0	0	0	0	0	0	0	0
Schistocomus hiltoni	0	0	0	0	0	0	0	0	0
Scoletoma luti	42	3	17	17	15	3	73	94	95
Sigambra tentaculata	0	0	0	0	0	0	0	0	0
Sphaerodoropsis sphaerulifer	0	0	0	0	0	0	0	0	0
Sphaerosyllis brandhorsti	0	1	0	0	0	2	0	4	0
Spio filicornis	0	0	0	0	0	0	0	0	0
Spiochaetopterus costarum	9	1	1	1	1	0	0	0	0
Spionidae	0	0	0	0	0	0	0	0	0
Spiophanes berkeleyorum	2	0	4	0	0	0	1	1	0
Spiophanes sp.	0	0	0	0	0	0	0	0	0
Stemaspis scutata	0	0	0	0	0	0	0	0	0
Sthenelais tertiaglabra	1	0	0	0	0	0	0	0	0
Streblosoma bairdi	0	0	0	0	0	0	0	0	0
Syllis harti	0	0	0	0	0	0	0	0	0
Tenonia priops	0	0	0	0	0	1	0	0	0
Terebellidae	0	2	1	0	0	0	0	0	0
Terebellides californica	2	0	1	0	0	0	0	2	1
Terebellides sp.	1	0	0	0	0	0	0	0	0
Terebellides stroemi	0	0	0	1	0	0	0	0	0
Thelepus setosus	0	0	0	0	0	0	0	0	0
Trochochaeta multisetosa	0	0	0	0	0	0	0	0	0
Oligochaeta	0	0	0	0	0	1	0	0	0
Abundance									
Richness	51	41	43	22	24	31	39	48	37

ANNELIDA	Total HY21I	Total HY22I	Total HY23I	Total HY24I	Total HY25I	Total HY26I	Total HY27I	Total HY28I	Total HY30I
Amage anops	0	0	0	0	0	0	0	0	0
Ampharete acutifrons	0	2	0	0	0	0	0	0	0
Ampharete finmarchica	2	15	14	0	0	0	2	0	0
Ampharete labrops	7	5	7	2	7	3	4	3	0
Ampharete sp.	0	0	1	0	0	0	0	0	0
Ampharetidae	1	0	0	0	0	0	0	0	0
Amphicteis mucronata	0	0	0	0	0	0	0	0	0
Anobothrus gracilis	0	0	0	0	0	0	0	0	5
Aphelochaeta monilaris	47	33	40	4	3	0	0	6	17
Aphelochaeta sp. C	1907	2629	1419	81	113	331	159	133	1979
Aphelochaeta spp	0	0	0	0	0	0	0	0	0
Arabellidae	0	0	0	0	0	0	0	0	1
Aricidea lopezi	1	0	0	0	0	0	0	0	0
Aricidea ramosa	0	0	0	0	0	0	0	0	0
Armandia brevis	0	0	5	0	0	0	0	0	2
Artacama coniferi	0	1	0	0	0	0	0	0	0
Artacamella hancocki	0	0	0	0	0	0	0	0	0
Asabellides lineata	0	2	0	0	0	0	0	0	0
Asabellides sibirica	0	0	0	0	0	0	0	0	0
Barantolla americana	0	0	0	0	0	0	0	2	0
Boccardia pugettensis	0	0	0	0	0	0	0	0	8
Boccardiella hamata	0	1	3	0	1	1	6	0	22
Capitella capitata	4	4	4	26	4	1	0	0	1
Caulleriella sp. A	0	0	0	0	0	0	0	0	11
Chaetozone acuta	150	510	585	2425	2483	993	841	1170	14
Chaetozone setosa	3	17	21	0	0	1	0	2	5
Chaetozone sp.	0	0	0	0	0	0	0	0	0
Chirimia similis	0	0	0	0	0	0	0	0	0
Cirratulidae	0	0	0	0	0	0	0	1	0
Cirratulus cirratus	31	0	3	0	30	107	89	324	1
Cirratulus sp.	0	0	0	0	0	0	0	0	0
Clymenura columbiana	0	0	0	0	0	0	0	0	0
Cossura pygodactylata	99	80	84	0	9	1	0	1	3
Cossura sp.	0	0	0	12	0	0	0	2	0
Demonax medius	0	0	0	0	0	0	0	0	0
Diopatra ornata	0	0	0	0	0	0	0	0	3
Dorvillea rudolphi	0	2	3	8	5	6	0	3	1
Drilonereis falcata minor	0	0	0	0	0	0	0	0	2
Ehlersia heterochaeta	0	0	0	0	0	0	0	0	0
Eteone californica	0	0	0	0	0	0	0	0	0
Eteone longa	1	3	1	0	0	0	0	0	12
Eteone sp.	0	0	0	0	0	0	0	0	0
Eteone spilotus	0	0	0	0	0	0	0	0	0
Euchone incolor	36	106	125	0	1	0	0	2	0
Euchone limnicola	164	418	486	10	330	257	176	40	1
Euchone spp.	0	0	0	0	0	0	0	0	0
Euclymene cf. zonalis	0	0	0	0	0	0	0	0	0
Euclymeninae	0	0	0	0	0	0	0	0	0
Eudistylia catherinae	0	0	1	0	0	0	0	0	0
Eulalia bilineata	0	0	0	0	0	0	0	0	0
Eulalia sanguinea	2	0	2	0	0	0	2	1	6
Eusyllis habei	0	0	0	0	0	0	0	0	0
Exogone molesta	0	1	0	0	0	0	0	0	0
Galathowenia oculata	0	0	0	0	0	0	0	0	0
Glycera americana	0	0	5	0	1	0	1	2	2
Glycera nana	0	0	0	2	3	0	2	1	6
Glycera sp.	0	0	0	0	0	0	0	0	0
Glycinde armigera	0	0	0	0	0	0	0	0	0
Glycinde picta	5	3	6	4	0	2	4	3	1
Glycinde polygnatha	0	0	0	0	1	2	0	0	0
Goniada brunnea	0	0	0	0	0	0	0	0	1
Goniada maculata	0	0	0	0	0	0	0	0	0
Gyptis brevipalpa	0	0	0	0	0	0	0	0	0
Harmothoe imbricata	0	0	0	0	0	0	0	1	0
Harmothoidae sp.	0	0	0	0	0	0	1	0	0
Hesionidae	0	0	0	0	0	0	0	0	0
Heteromastus filobranchus	2	2	0	0	2	0	1	0	1
Heteromastus sp.	0	0	0	0	0	0	0	0	0
Lanassa nordenskioeldi	1	4	6	0	0	0	0	0	2
Lanassa venusta	0	3	0	0	0	0	0	0	0
Laonice cirrata	0	0	0	0	0	0	0	0	0
Laonice pugettensis	0	0	0	0	0	0	0	0	0
Laonice spp.	0	0	0	0	0	0	0	0	0
Leitoscoloplos pugettensis	0	0	0	0	0	0	0	0	15
Lepidasthenia berkeleyae	0	0	0	0	0	0	0	0	0
Lepidasthenia longicirrata	0	0	0	0	0	0	0	0	0
Lepidonotus squamatus	0	0	0	0	0	0	0	0	0
Levinsenia gracilis	0	1	0	0	0	0	0	0	0
Lumbrineridae	28	101	74	3	20	16	17	17	218
Lumbrineris californiensis	0	0	0	0	0	0	0	0	20
Lumbrineris cruzensis	0	0	1	0	0	0	0	0	0
Magelona longicornis	0	0	0	0	0	0	0	0	1
Magelona sp.	0	0	0	0	0	0	0	0	0

ANNELIDA	Total HY21I	Total HY22I	Total HY23I	Total HY24I	Total HY25I	Total HY26I	Total HY27I	Total HY28I	Total HY30I
Maldane sarsi	0	0	0	0	0	0	0	0	0
Maldanidae	0	0	0	0	0	0	0	0	1
Malmgreniella bansei	0	0	2	0	0	0	0	0	0
Mediomastus ambiseta	0	0	0	0	0	0	0	0	0
Mediomastus californiensis	0	0	0	0	0	0	0	0	15
Mediomastus sp.	0	1	2	1	3	0	0	2	9
Melinna oculata	0	1	0	0	0	0	0	0	0
Mesochaetopterus taylori	0	0	0	0	0	0	0	0	2
Microphthalmus sczelkowii	0	0	0	0	0	0	0	0	0
Micropodarke dubia	4	2	18	9	1	1	0	0	7
Neoamphitrite edwardsi	0	0	0	0	0	0	0	0	0
Neoamphitrite robusta	0	0	1	0	0	0	0	0	0
Nephtys caeca	0	0	0	0	0	0	0	0	0
Nephtys comuta	111	77	45	2	6	33	1	2	12
Nephtys ferruginea	2	0	2	3	5	3	5	3	8
Nephtys sp.	0	0	0	0	0	0	0	0	0
Nereidae	0	0	0	0	0	0	0	0	0
Nereis procera	0	2	0	1	0	0	0	1	4
Nereis sp.	0	0	0	0	0	0	0	0	0
Nereis zonata	0	0	0	0	0	0	0	0	0
Notomastus latericeus	0	0	1	0	0	0	0	0	0
Notomastus sp.	0	0	0	0	0	0	0	0	0
Notomastus tenuis	0	0	0	0	0	0	0	0	37
Odontosyllis phosphorea	0	0	0	0	0	0	0	0	0
Onuphidae	0	0	0	0	0	0	0	0	0
Onuphis elegans	1	0	0	0	0	0	0	0	0
Ophelina acuminata	1	0	0	0	0	0	0	0	0
Owenia fusiformis	0	0	0	0	0	0	0	0	1
Paleanotus bellis	0	0	0	0	0	0	0	0	0
Paranaitis polynoides	0	0	0	0	0	0	0	0	0
Parandalia fauveli	0	0	0	0	0	0	0	0	0
Paraonidae	0	0	0	0	0	0	0	0	0
Paraprionospio pinnata	3	5	5	1	0	0	0	1	2
Parougia caeca	0	0	20	0	0	0	0	3	0
Pectinaria californiensis	0	0	0	0	0	1	0	2	0
Pectinaria granulata	0	0	0	0	0	0	0	0	5
Pectinaria sp.	0	0	0	0	0	0	0	0	0
Petaloproctus tenuis borealis	0	0	0	0	0	0	0	0	0
Pherusa plumosa	0	0	2	0	0	0	0	0	2
Pholoe minuta	1	0	0	0	0	0	0	0	0
Pholoides aspera	0	0	0	0	0	0	0	0	12
Phyllochaetopterus prolifica	1	0	0	0	0	0	0	0	12
Phyllodoce cuspidata	0	0	0	0	0	0	0	0	0
Phyllodoce groenlandica	0	0	0	0	0	0	0	0	1
Phyllodoce hartmanae	1	0	1	0	0	0	0	1	6
Phyllodoce longipes	0	2	0	0	0	1	0	0	2
Phyllodoce sp.	0	1	0	0	0	0	0	0	0
Phyllodocidae	0	0	0	0	0	0	0	0	0
Pilargis maculata	0	0	0	0	0	0	0	0	1
Pista brevibranchiata	0	0	4	0	0	0	0	0	0
Pista cristata	0	0	0	0	0	0	0	0	0
Pista disjuncta	3	11	70	1	3	2	6	0	4
Pista elongata	0	0	0	0	0	0	0	0	0
Pista moorei	0	0	0	0	0	0	0	0	0
Pista sp.	0	0	0	0	0	0	0	0	0
Platynereis bicanaliculata	1	0	1	1	0	0	0	0	19
Podarke pugettensis	0	0	3	2	1	1	0	1	5
Podarkeopsis glabrus	2	1	3	1	1	2	0	1	0
Polycirrus sp. complex	1	5	24	0	0	2	0	0	9
Polydora brachycephala	0	0	0	0	0	0	0	0	4
Polydora cardalia	2	7	15	1	0	0	0	0	3
Polydora caulleryi	1	1	3	3	0	4	1	0	0
Polydora kempi	0	0	0	0	0	1	0	0	0
Polydora limicola	0	0	0	0	0	0	0	0	2
Polydora socialis	12	32	28	1	4	3	1	1	541
Polydora sp.	1	0	0	0	0	0	0	0	3
Polynoidae	0	0	4	0	0	0	0	0	0
Praxillella affinis pacifica	0	0	1	0	0	0	0	0	0
Praxillella gracilis	0	0	0	0	0	0	0	0	0
Praxillella praetermissa	0	0	0	0	0	0	0	0	0
Praxillella sp.	0	0	1	0	0	0	0	0	0
Prionospio lighti	0	2	2	2	0	2	0	0	11
Prionospio multibranchiata	0	2	3	1	1	0	0	0	6
Prionospio sp.	0	0	0	0	0	0	0	0	1
Prionospio steenstrupi	13	16	73	13	4	3	2	3	174
Protodorvillea gracilis	0	1	0	0	0	0	0	0	0
Pseudopotamilla intermedia	0	0	0	0	0	0	0	0	1
Pseudopotamilla occelata	0	0	0	0	0	0	0	0	0
Pseudopotamilla sp.	0	0	1	0	0	0	0	0	0
Pterocirrus macroceros	0	0	0	0	0	0	0	0	0
Raricirrus maculatus	0	0	0	2	0	0	0	0	0
Rhodine bitorquata	0	0	0	0	0	0	0	0	0
Sabellaria cementarium	0	0	3	0	0	0	0	0	0

ANNELIDA	Total HY21I	Total HY22I	Total HY23I	Total HY24I	Total HY25I	Total HY26I	Total HY27I	Total HY28I	Total HY30I
Sabellidae	0	0	0	0	0	2	4	0	0
Scalibregma inflatum	0	0	0	0	0	0	0	0	1
Schistocomus hiltoni	0	0	0	0	0	0	0	0	0
Scoletoma luti	81	83	142	9	35	28	20	27	4
Sigambra tentaculata	0	0	0	0	0	0	0	0	0
Sphaerodoropsis sphaerulifer	0	0	0	0	0	0	0	0	0
Sphaerosyllis brandhorsti	0	3	5	0	0	0	0	0	0
Spio filicornis	0	0	0	0	0	0	0	0	0
Spiochaetopterus costarum	0	1	2	2	7	4	5	3	47
Spionidae	0	0	0	0	0	0	0	0	0
Spiophanes berkeleyorum	1	0	11	0	1	6	6	0	9
Spiophanes sp.	0	0	0	0	0	0	0	0	0
Sternaspis scutata	0	0	0	0	0	0	0	0	0
Sthenelais tertiaglabra	0	0	0	0	1	0	0	0	3
Streblosoma bairdi	0	0	0	0	0	0	0	0	0
Syllis hartl	0	0	0	0	0	0	0	0	0
Tenonia priops	0	0	0	0	0	0	0	0	2
Terebellidae	0	0	0	0	0	0	0	0	1
Terebellides californica	1	0	0	0	0	0	0	0	0
Terebellides sp.	0	0	0	0	0	0	0	0	0
Terebellides stroemi	0	0	0	0	0	0	0	0	0
Thelepus setosus	0	0	0	0	0	0	0	0	0
Trochochaeta multisetosa	0	0	0	0	0	0	0	0	0
Oligochaeta	0	0	0	0	0	0	0	0	3
Abundance									
Richness	40	44	55	30	30	31	24	34	70

ANNELIDA	Total HY35I	Total CR2I	Total CR2AI	Total
Amage anops	0	0	0	31
Ampharete acutifrons	0	0	0	37
Ampharete finmarchica	1	0	0	85
Ampharete labrops	0	2	0	67
Ampharete sp.	0	3	0	6
Ampharetidae	2	0	0	10
Amphictels mucronata	0	0	0	1
Anobothrus gracilis	21	0	0	48
Aphelochaeta monilaris	25	1	0	778
Aphelochaeta sp. C	976	119	0	29342
Aphelochaeta spp.	0	0	0	4
Arabellidae	0	0	0	1
Aricidea lopezi	0	0	0	9
Aricidea ramosa	0	1	0	1
Armandia brevis	2	0	0	11
Artacama coniferi	1	1	0	14
Artacamella hancocki	0	0	0	1
Asabellides lineata	13	0	0	132
Asabellides sibirica	0	0	0	1
Barantolla americana	0	0	0	21
Boccardia pugettensis	8	0	0	40
Boccardiella hamata	0	0	0	478
Capitella capitata	1	1	0	124
Caulleriella sp. A	0	0	0	13
Chaetozone acuta	9	0	4	9505
Chaetozone setosa	3	0	0	419
Chaetozone sp.	0	0	0	18
Chirimia similis	1	0	0	1
Cirratulidae	0	0	0	1009
Cirratulus cirratus	6	0	0	660
Cirratulus sp.	0	0	0	2
Clymenura columbiana	0	0	0	2
Cossura pygodactylata	0	0	2	559
Cossura sp.	0	0	0	110
Demonax medius	0	0	0	1
Diopatra ornata	0	0	0	11
Dorvillea rudolphi	0	0	0	29
Drilonereis falcata minor	5	0	0	10
Ehlersia heterochaeta	1	0	0	2
Eteone californica	0	0	0	1
Eteone longa	39	3	0	69
Eteone sp.	11	2	0	15
Eteone spilotus	0	0	0	1
Euchone incolor	1	0	0	532
Euchone limnicola	0	0	0	2164
Euchone spp.	0	0	0	18
Eucleymene cf. zonalis	0	1	0	1
Euclymeninae	0	8	0	10
Eudistylia catherinae	0	0	0	1
Eulalia bilineata	2	0	0	2
Eulalia sanguinea	16	0	0	49
Eusyllis habei	2	0	0	3
Exogone molesta	0	0	0	1
Galathowenia oculata	0	0	0	1
Glycera americana	1	1	0	17
Glycera nana	9	14	13	120
Glycera sp.	0	0	0	1
Glycinde armigera	2	31	1	37
Glycinde picta	3	1	2	71
Glycinde polygnatha	0	0	0	4
Goniada brunnea	0	0	0	21
Goniada maculata	0	0	1	1
Gyptis brevipalpa	0	0	0	1
Harmothoe imbricata	3	0	0	4
Harmothoidae sp.	0	0	0	1
Hesionidae	0	1	0	1
Heteromastus filobranchus	0	1	0	24
Heteromastus sp.	0	0	0	5
Lanassa nordenskioeldi	0	1	0	154
Lanassa venusta	0	0	0	8
Laonice cirrata	2	0	3	9
Laonice pugettensis	5	0	0	5
Laonice spp.	0	0	0	1
Leitoscoloplos pugettensis	2	58	1	112
Lepidasthenia berkeleyae	1	1	7	10
Lepidasthenia longicirrata	0	0	0	2
Lepidonotus squamatus	0	0	0	2
Levinsenia gracilis	0	4	25	53
Lumbrineridae	80	82	2	1473
Lumbrineris californiensis	13	21	0	140
Lumbrineris cruzensis	4	0	34	49
Magelona longicornis	32	13	0	129
Magelona sp.	6	4	0	10

ANNELIDA	Total HY35I	Total CR2I	Total CR2AI	Total
Maldane sarsi	2	0	0	2
Maldanidae	12	17	1	40
Malmgreniella bansei	0	0	0	9
Mediomastus ambiseta	0	0	6	8
Mediomastus californiensis	0	41	0	78
Mediomastus sp.	124	10	0	200
Melinna oculata	1	3	0	13
Mesochaetopterus taylori	13	14	0	56
Microphthalmus sczelkowii	3	0	0	3
Micropodarke dubia	3	1	0	58
Neoamphitrite edwardsi	0	0	0	2
Neoamphitrite robusta	0	0	0	2
Nephtys caeca	0	0	1	1
Nephtys comuta	9	6	8	755
Nephtys ferruginea	11	2	2	106
Nephtys sp.	2	1	0	16
Nereidae	0	0	0	1
Nereis procera	4	1	0	35
Nereis sp.	0	0	0	1
Nereis zonata	0	0	0	3
Notomastus latericeus	1	4	0	8
Notomastus sp.	0	0	0	18
Notomastus tenuis	29	7	0	385
Odontosyllis phosphorea	1	0	0	2
Onuphidae	0	0	0	2
Onuphis elegans	2	2	0	8
Ophelina acuminata	0	0	0	18
Owenia fusiformis	0	0	0	1
Paleanotus bellis	1	1	0	3
Paranaitis polynoides	0	0	0	2
Parandalia fauveli	4	0	0	4
Paraonidae	0	0	0	2
Paraprionospio pinnata	5	4	3	105
Parougia caeca	0	0	0	26
Pectinaria californiensis	0	42	1	55
Pectinaria granulata	0	0	0	70
Pectinaria sp.	0	37	1	38
Petaloproctus tenuis borealis	18	0	0	18
Pherusa plumosa	0	0	0	4
Pholoe minuta	1	36	33	76
Pholoides aspera	21	0	0	56
Phyllochaetopterus prolifica	56	3	0	87
Phyllodoce cuspidata	1	0	0	2
Phyllodoce groenlandica	2	0	0	3
Phyllodoce hartmanae	7	0	0	52
Phyllodoce longipes	10	1	0	27
Phyllodoce sp.	5	0	0	15
Phyllodocidae	0	0	0	1
Pilargis maculata	2	20	3	31
Pista brevibranchiata	0	0	0	13
Pista cristata	0	0	0	2
Pista disjuncta	1	7	0	157
Pista elongata	0	0	0	1
Pista moorei	0	0	0	4
Pista sp.	1	0	0	8
Platynereis bicanaliculata	32	0	0	69
Podarke pugettensis	3	0	0	33
Podarkeopsis glabrus	5	3	0	25
Polycirrus sp. complex	9	2	0	228
Polydora brachycephala	2	0	0	35
Polydora cardalia	4	0	0	54
Polydora cauleryi	9	0	0	43
Polydora kempi	0	0	0	1
Polydora limicola	5	0	0	20
Polydora socialis	1491	2	0	3520
Polydora sp.	0	0	0	34
Polynoidae	0	2	0	15
Praxillella affinis pacifica	0	1	12	19
Praxillella gracilis	0	0	0	9
Praxillella praetermissa	0	0	0	2
Praxillella sp.	0	7	0	8
Prionospio lighti	29	45	89	198
Prionospio multibranchiata	4	0	0	21
Prionospio sp.	0	0	0	2
Prionospio steenstrupi	301	217	26	1353
Protodorvillea gracilis	0	0	0	1
Pseudopotamilla intermedia	0	0	0	3
Pseudopotamilla occelata	0	0	0	2
Pseudopotamilla sp.	0	0	0	2
Pterocirrus macroceros	0	0	0	1
Raricirrus maculatus	0	0	0	2
Rhodine bitorquata	5	0	0	8
Sabellaria cementarium	2	0	0	21

ANNELIDA	Total HY35I	Total CR2I	Total CR2AI	Total
Sabellidae	0	0	0	21
Scalibregma inflatum	0	0	0	2
Schistocomus hiltoni	0	0	0	3
Scoletoma luti	27	156	0	1613
Sigambra tentaculata	0	10	55	65
Sphaerodoropsis sphaerulifer	1	3	0	7
Sphaerosyllis brandhorsti	2	0	0	19
Spio filicornis	1	0	0	1
Spiochaetopterus costarum	193	25	3	523
Spionidae	3	0	0	3
Spiophanes berkeleyorum	22	1	4	100
Spiophanes sp.	0	0	0	6
Sternaspis scutata	0	0	0	5
Sthenelais tertiaglabra	1	1	2	17
Streblosoma bairdi	0	0	0	1
Syllis harti	3	0	0	3
Tenonia priops	5	2	0	13
Terebellidae	3	0	0	17
Terebellides californica	7	12	3	42
Terebellides sp.	0	1	0	3
Terebellides stroemi	0	0	0	5
Thelepus setosus	0	2	0	2
Trochochaeta multisetosa	0	0	0	1
Oligochaeta	13	35	448	501
Abundance				
Richness	93	66	0	190

Mollusca Abundance Data

MOLLUSCA	HY1I-1	HY1I-2	HY1I-3	HY1I-4	HY2I-1	HY2I-2	HY2I-3	HY2I-7	HY3I-1	HY3I-2	HY3I-3	HY3I-7	HY4I-4
Acila castrensis													
Acteocina culcitella													
Adontorhina cyclia		1	1										
Aeolidacea sp. juv.													
Alvania compacta	1												
Axinopsida serricata	13	4	42	7	18	9	28	17	2 32	16 24	6 23	5 14	4
Barleeia subtenuis													
Bivalvia sp. Indet.													
Bivalvia sp. Juv.				1					1		1		
Cardiidae sp. juv.													
Cardiomya pectinata				2		1							
Chaetodermatidae			2							2		1	
Clinocardium nuttalli											1		
Clinocardium sp. Juv.													1
Compsomyax subdiaphana	1	1	3	4	1	2	2	2	7	2	3	2	
Corambe pacifica													
Crepipatella lingulata													
Cuthona sp. Indet.													
Cyclocardia ventricasa													
Cylichna attonsa													
Diaphana sp. Indet.													
Doridoidea sp. Juv.												1	
Flabellina sp.indet.													
Gastropoda sp. Indet.													
Gastropteron pacificum				1									
Haminoea vesicula													
Hiatella arctica	1									1	2		
Kurtzia arteaga	2	2	1	1	1	1		1	1				
Lacuna vincta													
Lasaea subviridis													
Lucinidae sp.Juv.													
Lucinoma annulatum				1	1			6	2	2	2		
Lyonsia californica	14	9	14	4	9	8	8	14	23	32	24	17	
Lyonsia sp. Juv.													
Macoma calcarea	2	1								3			
Macoma carlottensis	5	1	5	3									
Macoma nasuta													
Macoma obliqua													
Macoma sp. Juv.	3	6	6	6	2	2	3	1	3	6	3	2	
Macoma yoldiformis		1											
Megacrenella columbiana	2	2	2	1	3		2	1	7	9	3	4	
Melanella sp. Indet.						1			1		1		
Melanochlamys diomedea				1							2		
Mitrella tuberosa													
Musculus sp. Indet.													
Mya arenaria								1					
Mya sp. Indet.													
Mya pseudoarenaria		1		1					1	2	2	1	1
Mysella sp. A													
Mysella tumida			1			1			2				
Mytilus edulis											2		
Mytilidae sp. Juv.					1					2	4	2	
Nassarius mendicus													1
Natica clausa													
Nemocardium centrifilosum	4	5	4		1	5			2	9	1	1	
Nitidella gouldi	6	1		8	1		2			1			13
Nucula tenuis	1	1			1			1					
Nudibranchia sp. Indet.													
Odostomia sp. Indet.		1	1	7				1		1	2		
Onchidoris sp.Juv.													
Pandora filosa			1		1				1		1		
Panopea abrupta			1										
Parvilucina tenuisculpta		1			2	1	5		7	6	6	6	
Pododesmus macrochisma													
Polinices pallidus													
Polinices sp.Juv.													
Prototheca staminea													
Psephidia lordi		1	2		3	3	4	2	22	29	10	23	1
Rictaxis punctocaelatus	5		4	2	1		3						
Saxidomus giganteus									4	1			
Solen sicarius	1				4		1		1	1	1	2	
Tellina modesta													
Tellina sp. Juv.													
Tellinidae sp. Indet.													
Thyasira gouldi													
Tresus capax													
Tresus sp.Indet.													
Turbonilla sp. Indet.	3	4	3	1	1	6		6	9	27	20	28	1
Turridae sp. Indet.													
Xylophaga washingtona								1					
Abundance	64	43	93	51	51	40	58	54	128	176	129	108	22
Richness													

MOLLUSCA	HY4I-5	HY4I-6	HY4I-7	HY5I-1	HY5I-2	HY5I-4	HY5I-6	HY6I-1	HY6I-3	HY6I-5	HY6I-7	HY7L-1	HY7L-2
Actia castrensis													
Acteocina culcitella													
Adontorhina cyclia													
Aeolidacea sp. juv.						1							
Alvania compacta							7		11		4	1	3
Axinopsida serricata	9	9	5	42	26	40	10	0	1	5	7	2	5
Barleeia subtenuis													
Bivalvia sp. Indet.													
Bivalvia sp. Juv.									1				
Cardiidae sp. juv.													
Cardiomya pectinata													
Chaetodermatidae				1									
Clinocardium nuttali												1	
Clinocardium sp. Juv.			2										
Compsomyax subdiaphana	1	1	2		1	1	1	3	2			5	2
Corambe pacifica													
Crepipatella lingulata													
Cuthona sp. Indet.													1
Cyclocardia ventricasa													
Cylichna attonsa				1									
Diaphana sp. Indet.													
Doridoidea sp. Juv.													
Flabellina sp.Indet.													
Gastropoda sp. Indet.													
Gastropteron pacificum													
Haminoea vesicula													
Hiatella arctica									1				
Kurtzia arteaga								1	1				
Lacuna vincta													
Lasaea subviridis													
Lucinidae sp.Juv.													
Lucinoma annulatum				1	1	2	1						
Lyonsia californica				10	13	7	6	6	12	10	6	15	12
Lyonsia sp. Juv.			2										
Macoma calcarea						4							
Macoma carlottensis				1		2							
Macoma nasuta													
Macoma obliqua											2		
Macoma sp. Juv.				4	11	4	2	3	2	2	3	2	2
Macoma yoldiformis				1	1	1				2			
Megacrenella columbiana			1			2	3	1					
Melanella sp. Indet.					1								
Melanochlamys diomedea													
Mitrella tuberosa													
Musculus sp. Indet.													
Mya arenaria								1					
Mya sp. Indet.						1							
Mya pseudoarenaria									1		1	1	
Myella sp. A													
Myella tumida		1				1				1			1
Mytilus edulis													
Mytilidae sp. Juv.	1						1	1					
Nassarius mendicus													
Natica clausa													
Nemocardium centrifilosum				4		3	2		4	1		2	
Nitidella gouldi		12	12	3				8	25	16	3	13	
Nucula tenuis		1									1		
Nudibranchia sp. Indet.													
Odostomia sp. Indet.			1	3		4	3	1	1	4	1		2
Onchidoris sp.Juv.													
Pandora filosa	1												
Panopea abrupta													
Parvilucina tenuisculpta		1		10	2	4	4			1		3	5
Pododesmus macrochisma													
Polinices pallidus													
Polinices sp.Juv.													
Prototheca staminea													
Psephidia lordi		1	1	6	5	10	3	13	14	10	6	17	4
Rictaxis punctocaelatus							1						
Saxidomus giganteus											1	2	1
Solen sicarius		1		3								2	
Tellina modesta													
Tellina sp. Juv.													
Tellinidae sp. Indet.													
Thyasira gouldi													
Tresus capax													
Tresus sp.Indet.													
Turbonilla sp. Indet.		3	3	57	20	29	26	15	19	21	3	12	10
Turridae sp. Indet.													
Xylophaga washingtona													
Abundance	11	29	20	147	90	125	91	56	95	73	38	78	48
Richness													

MOLLUSCA	HY7I-3	HY7I-6	HY8I-1	HY8I-4	HY8I-5	HY8I-7	HY9I-1	HY9I-2	HY9I-3	HY9I-4	HY10I-3	HY10I-5	HY10I-6
Adia castrensis													
Acteocina culcitella													
Adontorhina cyclia													
Aeolidacea sp. juv.													
Alvania compacta	1		1			6	7	7	18	9	2	23	3
Axinopsida serricata	6	2	1	4	1	6	5			2	10	19	13
Barleeia subtenuis													
Bivalvia sp. Indet.													
Bivalvia sp. Juv.													
Cardiidae sp. juv.													
Cardiomya pectinata													
Chaetodermatidae													
Clinocardium nuttall	1	1	1	2								1	
Clinocardium sp. Juv.						1							
Compsomyax subdiaphana	3			1	1	1	3	2	3	3	1		
Corambe pacifica													
Crepipatella lingulata													
Cuthona sp. Indet.													
Cyclocardia ventricasa							1						
Cylichna attonsa													
Diaphana sp. Indet.													
Doridoidea sp. Juv.													
Flabellina sp.Indet.													
Gastropoda sp. Indet.													
Gastropteron pacificum													
Haminoea vesicula													
Hiatella arctica													
Kurtzia arteaga			1										
Lacuna vincta							1						
Lasaea subviridis													
Lucinidae sp.Juv.													
Lucinoma annulatum		1									2	2	1
Lyonsia californica	7		1	3	2	1	1	4	11	7		3	2
Lyonsia sp. Juv.													
Macoma calcarea													
Macoma carlottensis				1		1			1				
Macoma nasuta													
Macoma obliqua													
Macoma sp. Juv.	1	1			2	2	9		4	15	2	2	1
Macoma yoldiformis	1			1	1					1			
Megacrenella columbiana											1		
Melanella sp. Indet.													
Melanochlamys diomedea						1							
Mitrella tuberosa													
Musculus sp. Indet.													
Mya arenaria													
Mya sp. Indet.													
Mya pseudoarenaria	1							1	1	1			
Mysella sp. A								1					
Mysella tumida	1				1	4	1		1	2	2	1	
Mytilus edulis													
Mytilidae sp. Juv.	1		1			2				1	1		
Nassarius mendicus													
Natica clausa							1						
Nemocardium centrifilosum	1				1		2		1				
Nitidella gouldi								3	5				
Nucula tenuis													
Nudibranchia sp. Indet.													
Odostomia sp. Indet.	1	1	1			1	2				2	3	
Onchidoris sp.Juv.													
Pandora filosa													
Panopea abrupta													
Parvilucina tenuisculpta		1		1		5	1				5	12	
Pododesmus macrochisma													
Polinices pallidus													
Polinices sp.Juv.													
Protothaca staminea								1	3			1	
Psephidia lordi	3	2		1			3	19	10	4	16	20	1
Rictaxis punctocaelatus													
Saxidomus giganteus									2	1	1	1	1
Solen sicarius					1	1							
Tellina modesta													
Tellina sp. Juv.						1							
Tellinidae sp. Indet.													
Thyasira gouldi												1	
Tresus capax													
Tresus sp.Indet.													
Turbonilla sp. Indet.	2	10				2	28	1	3	1	30	31	11
Turridae sp. Indet.													
Xylophaga washingtona													
Abundance	30	19	7	14	10	35	65	39	63	47	75	120	33
Richness													

MOLLUSCA	HY10I-7	HY11I-1	HY11I-3	HY11I-4	HY11I-7	HY12I-1	HY12I-4	HY12I-5	HY12I-6	HY13I-1	HY13I-2	HY13I-6	HY13L-7
Acila castrensis													
Acteocina culcitella													
Adontorhina cyclia													
Aeolidacea sp. juv.													
Alvania compacta	5						5	1		1	1	3	1
Axinopsida serricata	49	113	43	102	116	58	64	66	2	8	0	1	7
Barleeia subtenuis													
Bivalvia sp. Indet.													
Bivalvia sp. Juv.													
Cardiidae sp. juv.													
Cardiomya pectinata													
Chaetodermatidae						1							
Clinocardium nuttalli	2	1		2	2								
Clinocardium sp. Juv.													
Compsomyax subdiaphana		2	1	1		1	1	1		1			
Corambe pacifica													
Crepipatella lingulata													
Cuthona sp. Indet.													
Cyclocardia ventricasa													
Cylichna attonsa													
Diaphana sp. Indet.					1								
Dorididoidea sp. Juv.													
Fiabellina sp.Indet.													
Gastropoda sp. Indet.													
Gastropteron pacificum													
Haminoea vesicula		1											
Hiatella arctica													
Kurtzia arteaga													
Lacuna vincta													
Lasaea subviridis							1						
Lucinidae sp.Juv.								1					
Lucinoma annulatum		1	1		3	1	2	6					
Lyonsia californica	1	4	3	2		1	3	5	8	3		5	3
Lyonsia sp. Juv.													
Macoma calcarea													
Macoma carlottensis				3	6	1	3	2		1			
Macoma nasuta													
Macoma obliqua													
Macoma sp. Juv.	1	1		4	5	2	5					4	4
Macoma yoldiformis		1				2	4	1	1				
Megacrenella columbiana		1											
Melanella sp. Indet.													
Melanochlamys diomedea													
Mitrella tuberosa													
Musculus sp. Indet.													
Mya arenaria		1											
Mya sp. Indet.													
Mya pseudoarenaria													
Mysella sp. A													
Mysella tumida		1		3	2	1	3	1					
Mytilus edulis													
Mytilidae sp. Juv.		1						1					
Nassarius mendicus													
Natica clausa						1							
Nemocardium centrifilosum													
Nitidella gouldi		3		4		6							
Nucula tenuis								3					
Nudibranchia sp. Indet.													
Odostomia sp. Indet.		1		1	1	1	1	1		1			
Onchidoris sp.Juv.													
Pandora filosa													
Panopea abrupta													
Parvilucina tenuisculpta	8	3		5	1	4	7	4					
Pododesmus macrochisma													
Polinices pallidus													
Polinices sp.Juv.													
Protothaca staminea													
Psephidia lordi	1	6	1	5	4	5	33	12	9	1		7	7
Rictaxis punctocaelatus													
Saxidomus giganteus	2					2							
Solen sicarius							1						
Tellina modesta													
Tellina sp. Juv.													
Tellinidae sp. Indet.													
Thyasira gouldi													
Tresus capax													1
Tresus sp.Indet.													
Turbonilla sp. Indet.	28	17	4	40	2	3	18	14	5	10		6	4
Turridae sp. Indet.												1	
Xylophaga washingtona													
Abundance	97	160	53	172	143	99	141	118	25	26	4	27	27
Richness													

MOLLUSCA	HY14I-1	HY14I-2	HY14I-3	HY14I-7	HY15I-1	HY15I-3	HY15I-4	HY15I-5	HY16I-2	HY16I-3	HY16I-4	HY16I-6	HY17I-1
Adia castrensis													
Acteocina culcitella													
Adontorhina cyclia													
Aeolidacea sp. juv.													
Alvania compacta			1			1	4	4		1	1		1
Axinopsida serricata	27	14	16	22	103	86	39	88	77	72	113	101	2
Barleeia subtenuis													
Bivalvia sp. Indet.													
Bivalvia sp. Juv.							1						
Cardiidae sp. juv.													
Cardiomya pectinata													
Chaetodermatidae													
Clinocardium nuttali				1		1	1	1					
Clinocardium sp. Juv.													
Compsomyax subdiaphana					3		2	2	2		1	1	
Corambe pacifica													
Crepipatella lingulata													
Cuthona sp. Indet.													
Cyclocardia ventricasa													
Cylichna attonsa													
Diaphana sp. Indet.													
Doridoidea sp. Juv.													
Flabellina sp.Indet.													
Gastropoda sp. Indet.	2												
Gastropteron pacificum													
Haminoea vesicula													
Hiatella arctica													
Kurtzia arteaga													
Lacuna vincta													
Lasaea subviridis													
Lucinidae sp.Juv.													
Lucinoma annulatum						1							
Lyonsia californica		1	2		2	2	4	9	2	1	3	2	
Lyonsia sp. Juv.													
Macoma calcarea	1					1							
Macoma carlottensis	1	3			4	1		3	1		5	7	
Macoma nasuta								2					
Macoma obliqua							1						
Macoma sp. Juv.	1			1	4	1			4	10	6	4	
Macoma yoldiformis	1											1	
Megacrenella columbiana										1			
Melanella sp. Indet.													
Melanochlamys diomedea													
Mitrella tuberosa							1						
Musculus sp. Indet.													
Mya arenaria													
Mya sp. Indet.													
Mya pseudoarenaria							1						
Mysella sp. A													
Mysella tumida		3			10	13	2	3	6	21	7	25	
Mytilus edulis													
Mytilidae sp. Juv.									1		1		
Nassarius mendicus													
Natica clausa													
Nemocardium centrifilosum				1									
Nitidella gouldi		3					3	3			1		
Nucula tenuis		1			1								
Nudibranchia sp. Indet.													
Odostomia sp. Indet.							1	2	1				
Onchidoris sp.Juv.													
Pandora filosa							1	1		2			
Panopea abrupta													
Parvilucina tenuisculpta						5	1	2				3	
Pododesmus macrochisma													
Polinices pallidus													
Polinices sp.Juv.													
Protothaca staminea													
Psephidia lordi		3	1	6	10	7	27	47	14	26	49	46	1
Rictaxis punctocaelatus													
Saxidomus giganteus								1					
Solen sicarius													
Tellina modesta													
Tellina sp. Juv.											1		
Tellinidae sp. Indet.													
Thyasira gouldi				1									
Tresus capax													
Tresus sp.Indet.													
Turbonilla sp. Indet.	1	8	3	1	1	1	8	13	1	1	3	3	
Turridae sp. Indet.													
Xylophaga washingtona													
Abundance	34	36	23	33	138	120	97	181	109	135	191	193	4
Richness													

MOLLUSCA	HY17I-2	HY17I-5	HY17I-6	HY18I-1	HY18I-2	HY18I-4	HY18I-5	HY19I-2	HY19I-3	HY19I-4	HY19I-5	HY20I-1	HY20I-2
Actia castrensis													
Acteocina culcitella													
Adontorhina cyclia								1					
Aeolidacea sp. juv.													
Alvania compacta		1	7	2	1	1	3	16	2	10	2		
Axinopsida serricata	4		1	93	68	115	48	172	176	148	219	79	69
Barleeia subtenuis													
Bivalvia sp. Indet.													
Bivalvia sp. Juv.		1											
Cardiidae sp. juv.													
Cardiomya pectinata													
Chaetodermatidae													
Clinocardium nuttalli			1			1							
Clinocardium sp. Juv.													
Compsomyax subdiaphana				3	2					2			
Corambe pacifica													
Crepipatella lingulata													
Cuthona sp. Indet.													
Cyclocardia ventricosa													
Cylichna attonsa													
Diaphana sp. Indet.													
Doridoidea sp. Juv.													
Flabellina sp.Indet.													
Gastropoda sp. Indet.													
Gastropteron pacificum													
Haminoea vesicula													
Hiatella arctica													
Kurtzia arteaga													
Lacuna vincta													
Lasaea subviridis													
Lucinidae sp.Juv.													
Lucinoma annulatum				2	2				1	1			
Lyonsia californica				2	4	4	1	2		3	3		
Lyonsia sp. Juv.													
Macoma calcarea													
Macoma carlottensis	2			1	2	3	1	3		10	6	4	4
Macoma nasuta				1	2			2				1	
Macoma obliqua		1										2	
Macoma sp. Juv.	2	1	1	6	2	4	3	9	2	13	3		1
Macoma yoldiformis													
Megacrenella columbiana													
Melanella sp. Indet.													
Melanochlamys diomedea							1					1	
Mitrella tuberosa													
Musculus sp. Indet.													
Mya arenaria													
Mya sp. Indet.													
Mya pseudoarenaria													
Mysella sp. A													
Mysella tumida				4	7	1		9	16	35	17	9	16
Mytilus edulis													
Mytilidae sp. Juv.		2						1		1			
Nassarius mendicus													
Natica clausa													
Nemocardium centrifilosum													
Nitidella gouldi				1			16	1		2			1
Nucula tenuis											1		
Nuculbrandita sp. Indet.													
Odostomia sp. Indet.				2				2		4	2	4	
Onchidoris sp.Juv.													
Pandora filosa													
Panopea abrupta													
Parvilucina tenuisculpta		1			2	2	1	5	5		2	2	2
Pododesmus macrochisma													
Polinices pallidus													
Polinices sp.Juv.													
Protothaca staminea								1					
Psephidia lordi		4	3	25	21	68	38	21	1	29	28	7	6
Rictaxis punctocaelatus													
Saxidomus giganteus													
Solen sicarius													
Tellina modesta								1					
Tellina sp. Juv.								1		1	2		
Tellinidae sp. Indet.													
Thyasira gouldi													
Tresus capax													
Tresus sp.Indet.													
Turbonilla sp. Indet.		2		5	2	8	4	3		5	8	2	3
Turridae sp. Indet.													
Xylophaga washingtona													
Abundance	8	13	13	147	115	267	116	250	203	264	292	110	95
Richness													

MOLLUSCA	HY20I-4	HY20I-5	HY21I-1	HY21I-2	HY21I-4	HY21I-6	HY22I-1	HY22I-3	HY22I-5	HY22I-7	HY23I-1	HY23I-2	HY23I-4
Acila castrensis													
Acteocina culcitella													
Adontorhina cyclia													
Aeolidacea sp. juv.													
Alvania compacta				2		6	14			2		4	5
Axinopsida serricata	47	75	67	151	43	127	69	43	138	164	133	40	69
Barleeia subtenuis					1	1							
Bivalvia sp. Indet.													
Bivalvia sp. Juv.										1			
Cardiidae sp. juv.													
Cardiomya pectinata													
Chaetodermatidae													
Clinocardium nuttali					1			1					
Clinocardium sp. Juv.													
Compsomyax subdiaphana					1	1							
Corambe pacifica													
Crepipatella lingulata													
Cuthona sp. Indet.													
Cyclocardia ventricasa													
Cylichna attonsa													
Diaphana sp. Indet.													
Doridoidea sp. Juv.										1			
Flabellina sp.Indet.													
Gastropoda sp. Indet.													
Gastropteron pacificum													
Haminoea vesicula													
Hiatella arctica													
Kurtzia arteaga													
Lacuna vincta													
Lasaea subviridis													
Lucinidae sp.Juv.													
Lucinoma annulatum		1					1				3	1	
Lyonsia californica						1	1		1	2			
Lyonsia sp. Juv.													
Macoma calcarea													
Macoma carlottensis	4	2	7	4	3	4		8	17	3	2		
Macoma nasuta				2	1		1					1	1
Macoma obliqua									1		1		
Macoma sp. Juv.		4	7	4	4	6	3	1	5	9	6	4	8
Macoma yoldiformis													
Megacrenella columbiana												1	1
Melanella sp. Indet.													
Melanochlamys diomedea													
Mitrella tuberosa													
Musculus sp. Indet.													
Mya arenaria													
Mya sp. Indet.													
Mya pseudoarenaria													
Myella sp. A													
Myella tumida	10	3	4	8	23	8	7	9	16	4	12	12	9
Mytilus edulis													
Mytilidae sp. Juv.							1	1		1			
Nassarius mendicus													
Natica clausa													
Nemocardium centrifilosum													
Nitidella gouldi						1							
Nucula tenuis													
Nudibranchia sp. Indet.													
Odostomia sp. Indet.				2	2	2	2			1	1	1	1
Onchidoris sp.Juv.													
Pandora filosa													
Panopea abrupta													
Parvilucina tenuisculpta	2		1	1				2			1		2
Pododesmus macrochisma													
Polinices pallidus													
Polinices sp.Juv.													
Prototheca staminea													
Psephidia lordi	6	6	8	19	11	28	8	17	26	33	4	2	4
Rictaxis punctocaelatus													
Saxidomus giganteus													
Solen sicarius													
Tellina modesta													
Tellina sp. Juv.				2	2	1	1			1			
Tellinidae sp. Indet.													
Thyasira gouldi													
Tresus capax													
Tresus sp.Indet.													
Turbonilla sp. Indet.	6	1	2	1	4	23	3	3	2	2	1		2
Turridae sp. Indet.													
Xylophaga washingtona													
Abundance	75	92	96	196	96	209	111	85	206	224	164	66	101
Richness													

MOLLUSCA	HY23I-7	HY24I-1	HY24I-2	HY24I-3	HY24I-4	HY25I-4	HY25I-5	HY25I-6	HY25I-7	HY26I-3	HY26I-5	HY26I-6	HY26I-7
Acila castrensis													
Acteocina culcitella													
Adontorhina cyclia													
Aeolidacea sp. juv.													
Alvania compacta	3		2		1	1			2				1
Axinopsida serricata	98	23	3	9	24	6	16	31	41	1	7	7	6
Barleeia subtenuis													
Bivalvia sp. Indet.													
Bivalvia sp. Juv.									1				2
Cardiidae sp. juv.													
Cardiomya pectinata													
Chaetodermatidae													
Clinocardium nuttalli													
Clinocardium sp. Juv.							1						
Compsomyax subdiaphana													
Corambe pacifica													
Crepipatella lingulata													
Cuthona sp. Indet.													
Cyclocardia ventricasa													
Cylichna attonsa													
Diaphana sp. Indet.													
Doridoidea sp. Juv.													
Flabellina sp.Indet.													1
Gastropoda sp. Indet.				1									
Gastropteron pacificum													
Haminoea vesicula													
Hiatella arctica													
Kurtzia arteaga													
Lacuna vincta													
Lasaea subviridis													
Lucinidae sp.Juv.													
Lucinoma annulatum													
Lyonsia californica													
Lyonsia sp. Juv.													
Macoma calcarea													
Macoma carlottensis	4			1					3				
Macoma nasuta				1									
Macoma obliqua													
Macoma sp. Juv.	7	2	1		1	1		1			1		
Macoma yoldiformis													
Megacrenella columbiana													
Melanella sp. Indet.													
Melanochlamys diomedea													
Mitrella tuberosa													
Musculus sp. Indet.													
Mya arenaria													
Mya sp. Indet.													
Mya pseudoarenaria													
Myella sp. A													
Myella tumida	46			4		1							1
Mytilus edulis				1									
Mytilidae sp. Juv.										1			1
Nassarius mendicus													
Natica clausa													
Nemocardium centrifilosum													
Nitidella gouldi													
Nucula tenuis													
Nudibranchia sp. Indet													
Odostomia sp. Indet.	2		1						2				
Onchidoris sp.Juv.													
Pandora filosa													
Panopea abrupta													
Parvilucina tenuisculpta	2												
Pododesmus macrochisma													
Polinices pallidus													
Polinices sp.Juv.													
Protothaca staminea													
Psephidia lordi	8					1	1	2	4				1
Rictaxis punctocaelatus													
Saxidomus giganteus	1												
Solen sicarius													
Tellina modesta													
Tellina sp. Juv.	2												
Tellinidae sp. Indet.													
Thyasira gouldi	1												
Tresus capax													
Tresus sp.Indet.								1					
Turbonilla sp. Indet.	6												
Turridae sp. Indet.													
Xylophaga washingtona													
Abundance	180	25	7	17	26	10	18	35	53	2	8	7	13
Richness													

MOLLUSCA	HY27I-2	HY27I-3	HY27I-6	HY27I-7	HY28I-3	HY28I-5	HY28I-6	HY28I-7	HY30I-1	HY30I-2	HY30I-5	HY30I-6	HY35I-1
Acila castrensis													
Acteocina culcitella													
Adontorhina cyclia													2
Aeolidacea sp. juv.												1	
Alvania compacta											2	4	4
Axinopsida serricata	38	18	13	3	34	24	37	10	19	6	1		6
Barleeia subtenuis													
Bivalvia sp. Indet.													
Bivalvia sp. Juv.							2		1		2		2
Cardiidae sp. juv.											1		
Cardiomya pectinata													
Chaetodermatidae													
Clinocardium nuttali					1								
Clinocardium sp. Juv.						1							
Compsomyax subdiaphana													1
Corambe pacifica													
Crepipatella lingulata									6	4	1	1	7
Cumona sp. Indet.													
Cyclocardia ventricasa													
Cylichna attonsa													
Diaphana sp. Indet.													
Doridoidea sp. Juv.													
Flabellina sp.Indet.													
Gastropoda sp. Indet.									1				
Gastropteron pacificum													
Haminoea vesicula													
Hiatella arctica										1		1	
Kurtzia arteaga													
Lacuna vincta													
Lasaea subviridis													
Lucinidae sp.Juv.													
Lucinoma annulatum									1		2	2	
Lyonsia californica									2		1		2
Lyonsia sp. Juv.													
Macoma calcarea													2
Macoma carlottensis													
Macoma nasuta									1				
Macoma obliqua								1			2		3
Macoma sp. Juv.	1	2							9	7	12	9	5
Macoma yoldiformis									1		2	1	2
Megacrenella columbiana									8		1		8
Melanella sp. Indet.													
Melanochlamys diomedea													
Mitrella tuberosa													
Musculus sp. Indet.													
Mya arenaria													
Mya sp. Indet.													
Mya pseudoarenaria													
Mysella sp. A													
Mysella tumida	1						1		1	2	30	6	3
Mytilus edulis													
Mytilidae sp. Juv.									1				
Nassarius mendicus													
Natica clausa													
Nemocardium centrifilosum													
Nitidella gouldi											5		
Nucula tenuis									1				
Nudibranchia sp. Indet.								1	1				
Odostomia sp. Indet.		1	1									2	
Onchidoris sp.Juv.													
Pandora filosa													
Panopea abrupta													
Parvilucina tenuisculpta									6	5	8	9	34
Pododesmus macrochisma													
Polinices pallidus													
Polinices sp.Juv.													
Prototheca staminea													
Psephidia lordi							1				1		14
Rictaxis punctocaelatus													
Saxidomus giganteus													
Solen sicarius													
Tellina modesta													
Tellina sp. Juv.											2	1	
Tellinidae sp. Indet.													
Thyasira gouldi													
Tresus capax													
Tresus sp.Indet.													
Turbonilla sp. Indet.									13	4	9	5	5
Turridae sp. Indet.													
Xylophaga washingtona													
Abundance	40	21	14	3	35	25	41	12	72	29	82	42	100
Richness													

MOLLUSCA	HY35I-4	HY35I-5	HY35I-7	CR2I-1	CR2I-4	CR2I-5	CR2I-7	CR2AI-1	CR2AI-2	CR2AI-3	CR2AI-4	Total HY1I
Acila castrensis	12	1	5									0
Acteocina culcitella				6	4	3	2		1	2		0
Adontorhina cyclia		1										2
Aeolidacea sp. juv.												0
Alvania compacta	4	1	5									1
Axinopsida serricata	8	17	6			1	1	1		2		66
Barleeia subtenuis												0
Bivalvia sp. Indet.					2							0
Bivalvia sp. Juv.										1		1
Cardiidae sp. juv.												0
Cardiomya pectinata												2
Chaetodermatidae						1						2
Clinocardium nuttali												0
Clinocardium sp. Juv.			1									0
Compsomyax subdiaphana					1	1	1			1		9
Corambe pacifica											1	0
Crepipatella lingulata	62	12	14									0
Cuthona sp. Indet.												0
Cyclocardia ventricasa												0
Cylichna attonsa				1	1	1		4	1	3	2	0
Diaphana sp. Indet.												0
Doridoidea sp. Juv.												0
Flabellina sp.Indet.												0
Gastropoda sp. Indet.												0
Gastropteron pacificum												1
Haminoea vesicula												0
Hiatella arctica	1		1		1							1
Kurtzia arteaga		3		1	7	2	5					6
Lacuna vincta												0
Lasaea subviridis												0
Lucinidae sp.Juv.												0
Lucinoma annulatum												1
Lyonsia californica	5	2	1		2	3	2					41
Lyonsia sp. Juv.												0
Macoma calcarea	5	2	4	4								3
Macoma carlottensis	6	3	6									14
Macoma nasuta					1	2						0
Macoma obliqua	7	4	14		7							0
Macoma sp. Juv.	7	10	4	7	18	7	7	1		3		21
Macoma yoldiformis	6		3	4	5	14	2					1
Megacrenella columbiana	3	4	1									7
Melanella sp. Indet.	2	2	2									0
Melanochlamys diomedea				1								1
Mitrella tuberosa												0
Musculus sp. Indet.	1											0
Mya arenaria												0
Mya sp. Indet.												0
Mya pseudoarenaria												2
Myselia sp. A				6	7		26					0
Myselia tumida	6		1	261	437	516	362	11	5	11	6	1
Mytilus edulis												0
Mytilidae sp. Juv.					1	1				1		0
Nassarius mendicus				1	1							0
Natica clausa												0
Nemocardium centrifilosum												13
Nitidella gouldi				1								15
Nucula tenuis	3	2	1								1	2
Nudibranchia sp. Indet.												0
Odostomia sp. Indet.				1	2	1	3					9
Onchidoris sp.Juv.				1								0
Pandora filosa												1
Panopea abrupta												1
Parvilucina tenuisculpta	29	26	29	10	10	14	18					1
Pododesmus macrochisma			1									0
Polinices pallidus	1											0
Polinices sp.Juv.					1	1						0
Prototheca staminea					1							0
Psephidia lordi	3	3	1	17	43	2	14					3
Rictaxis punctocaelatus			1	3							1	11
Saxidomus giganteus			2		3							0
Solen sicarius												1
Tellina modesta				2	5	5	3					0
Tellina sp. Juv.				9	6	11	3					0
Tellinidae sp. Indet.						1						0
Thyasira gouldi	2											0
Tresus capax		1	3									0
Tresus sp.Indet.												11
Turbonilla sp. Indet.	9	11	8	2	3	7	9					0
Turridae sp. Indet.												0
Xylophaga washingtona												
Abundance	192	105	114	338	569	594	458	17	7	24	11	31
Richness												

MOLLUSCA	Total HY2I	Total HY3I	Total HY4I	Total HY5I	Total HY6I	Total HY7I	Total HY8I	Total HY9I	Total HY10I	Total HY11I
Acila castrensis	0	0	0	0	0	0	0	0	0	0
Acteocina culcitella	0	0	0	0	0	0	0	0	0	0
Adontorhina cyclia	0	0	0	0	0	0	0	0	0	0
Aeolidacea sp. juv.	0	0	0	1	0	0	0	0	0	0
Alvania compacta	0	29	0	7	15	5	7	41	33	0
Axinopsida serricata	72	103	25	145	16	15	12	7	01	374
Barleeia subtenuis	0	0	0	0	0	0	0	0	0	0
Bivalvia sp. Indet.	0	0	0	0	0	0	0	0	0	0
Bivalvia sp. Juv.	0	2	0	0	1	0	0	0	0	0
Cardiidae sp. juv.	0	0	0	0	0	0	0	0	0	0
Cardiomya pectinata	1	0	0	0	0	0	0	0	0	0
Chaetodermatidae	0	3	0	1	0	0	0	0	0	0
Clinocardium nuttali	0	1	0	0	0	3	3	0	3	5
Clinocardium sp. Juv.	0	0	3	0	0	0	1	0	0	0
Compsomyax subdiaphana	7	14	4	3	5	10	3	11	1	4
Corambe pacifica	0	0	0	0	0	0	0	0	0	0
Crepipatella lingulata	0	0	0	0	0	0	0	0	0	0
Cuthona sp. Indet.	0	0	0	0	0	1	0	0	0	0
Cyclocardia ventricasa	0	0	0	0	0	0	0	1	0	0
Cylichna attonsa	0	0	0	1	0	0	0	0	0	0
Diaphana sp. Indet.	0	0	0	0	0	0	0	0	0	1
Doridoidea sp. Juv.	0	1	0	0	0	0	0	0	0	0
Flabellina sp.Indet.	0	0	0	0	0	0	0	0	0	0
Gastropoda sp. Indet.	0	0	0	0	0	0	0	0	0	0
Gastropteron pacificum	0	0	0	0	0	0	0	0	0	0
Haminoea vesicula	0	0	0	0	0	0	0	0	0	0
Hiatella arctica	0	3	0	0	1	0	0	0	0	1
Kurtzia arteaga	3	1	0	0	2	0	1	0	0	0
Lacuna vincta	0	0	0	0	0	0	0	1	0	0
Lasaea subviridis	0	0	0	0	0	0	0	0	0	0
Lucinidae sp.Juv.	0	0	0	0	0	0	0	0	0	0
Lucinoma annulatum	7	6	0	5	0	1	0	0	5	5
Lyonsia californica	39	96	0	36	34	34	7	23	6	9
Lyonsia sp. Juv.	0	0	2	0	0	0	0	0	0	0
Macoma calcarea	0	3	0	4	0	0	0	0	0	0
Macoma carlottensis	0	0	0	3	0	0	2	1	0	9
Macoma nasuta	0	0	0	0	0	0	0	0	0	0
Macoma obliqua	0	0	0	0	2	0	0	0	0	0
Macoma sp. Juv.	8	14	0	21	10	6	4	28	6	10
Macoma yoldiformis	0	0	0	3	2	1	2	1	0	1
Megacrenella columbiana	0	23	1	5	1	0	0	0	1	1
Melanella sp. Indet.	1	2	0	1	0	0	0	0	0	0
Melanochlamys diomedea	0	2	0	0	0	0	1	0	0	0
Mitrella tuberosa	0	0	0	0	0	0	0	0	0	0
Musculus sp. Indet.	0	0	0	0	0	0	0	0	0	0
Mya arenaria	1	0	0	0	1	0	0	0	0	0
Mya sp. Indet.	0	0	0	1	0	0	0	0	0	1
Mya pseudoarenaria	0	6	1	0	2	2	0	3	0	0
Myselia sp. A	0	0	0	0	0	0	0	1	0	0
Myselia tumida	1	2	1	1	1	2	5	4	3	6
Mytilus edulis	0	2	0	0	0	0	0	0	0	0
Mytilidae sp. Juv.	1	8	1	1	1	1	3	1	1	1
Nassarius mendicus	0	0	1	0	0	0	0	0	0	0
Natica clausa	0	0	0	0	0	0	0	1	0	0
Nemocardium centrifilosum	6	13	0	9	5	3	1	3	0	0
Nitidella gouldi	3	1	37	3	52	13	0	8	0	7
Nucula tenuis	2	0	1	0	1	0	0	0	0	0
Nudibranchia sp. Indet.	0	0	0	0	0	0	0	0	0	0
Odostomia sp. Indet.	1	3	1	10	7	4	2	2	5	3
Onchidoris sp.Juv.	0	0	0	0	0	0	0	0	0	0
Pandora filosa	1	2	1	0	0	0	0	0	0	0
Panopea abrupta	0	0	0	0	0	0	0	0	0	0
Parvilucina tenuisculpta	8	23	1	20	1	9	6	1	25	9
Pododesmus macrochisma	0	0	0	0	0	0	0	0	0	0
Polinices pallidus	0	0	0	0	0	0	0	0	0	0
Polinices sp.Juv.	0	0	0	0	0	0	0	0	0	0
Protothaca staminea	0	0	0	0	0	0	0	4	1	0
Psephidia lordi	12	84	3	24	43	26	1	36	38	16
Rictaxis punctocaelatus	4	0	0	1	0	0	0	0	0	0
Saxidomus giganteus	0	5	0	0	1	3	0	3	5	0
Solen sicarius	5	5	1	3	0	2	2	0	0	0
Tellina modesta	0	0	0	0	0	0	0	0	0	0
Tellina sp. Juv.	0	0	0	0	0	0	1	0	0	0
Tellinidae sp. Indet.	0	0	0	0	0	0	0	0	0	0
Thyasira gouldi	0	0	0	0	0	0	0	0	1	0
Tresus capax	0	0	0	0	0	0	0	0	0	0
Tresus sp.Indet.	0	0	0	0	0	0	0	0	0	0
Turbonilla sp. Indet.	13	84	7	134	58	34	2	33	100	63
Turridae sp. Indet.	0	0	0	0	0	0	0	0	0	0
Xylophaga washingtona	1	0	0	0	0	0	0	0	0	0
Abundance										
Richness	23	29	17	25	23	20	20	22	17	19

MOLLUSCA	Total HY12I	Total HY13I	Total HY14I	Total HY15I	Total HY16I	Total HY17I	Total HY18I	Total HY19I	Total HY20I	Total HY21I
Acila castrensis	0	0	0	0	0	0	0	0	0	0
Acteocina culcitella	0	0	0	0	0	0	0	0	0	0
Acontorhina cyclia	0	0	0	0	0	0	0	1	0	0
Aeolidacea sp. juv.	0	0	0	0	0	0	0	0	0	0
Alvania compacta	6	6	1	9	2	9	7	30	0	8
Axinopsida serricata	177	19	79	316	363	7	324	714	262	388
Barleeia subtenuis	0	0	0	0	0	0	0	0	0	2
Bivalvia sp. Indet.	0	0	0	0	0	0	0	0	0	0
Bivalvia sp. Juv.	0	0	0	1	0	1	0	0	0	0
Cardiidae sp. juv.	0	0	0	0	0	0	0	0	0	0
Cardiomya pectinata	0	0	0	0	0	0	0	0	0	0
Chaetodermatidae	1	0	0	0	0	0	0	0	0	0
Clinocardium nuttalli	0	0	1	3	0	1	1	0	0	1
Clinocardium sp. Juv.	0	0	0	0	0	0	0	0	0	0
Compsomyax subdiaphana	3	1	0	7	4	0	5	2	0	2
Corambe pacifica	0	0	0	0	0	0	0	0	0	0
Crepipatella lingulata	0	0	0	0	0	0	0	0	0	0
Cuthona sp. Indet.	0	0	0	0	0	0	0	0	0	0
Cyclocardia ventricasa	0	0	0	0	0	0	0	0	0	0
Cylichna alfonsa	0	0	0	0	0	0	0	0	0	0
Diaphana sp. Indet.	0	0	0	0	0	0	0	0	0	0
Doridoidea sp. Juv.	0	0	0	0	0	0	0	0	0	0
Flabellina sp.Indet.	0	0	0	0	0	0	0	0	0	0
Gastropoda sp. Indet.	0	0	2	0	0	0	0	0	0	0
Gastropteron pacificum	0	0	0	0	0	0	0	0	0	0
Haminoea vesicula	0	0	0	0	0	0	0	0	0	0
Hiatella arctica	0	0	0	0	0	0	0	0	0	0
Kurtzia arteaga	0	0	0	0	0	0	0	0	0	0
Lacuna vincta	0	0	0	0	0	0	0	0	0	0
Lasaea subviridis	1	0	0	0	0	0	0	0	0	0
Lucinidae sp.Juv.	1	0	0	0	0	0	0	0	0	0
Lucinoma annulatum	9	0	0	1	0	0	4	2	1	0
Lyonsia californica	17	11	3	17	8	0	11	8	0	1
Lyonsia sp. Juv.	0	0	0	0	0	0	0	0	0	0
Macoma calcarea	0	0	1	1	0	0	0	0	0	0
Macoma carlottensis	6	1	4	8	13	2	7	19	14	18
Macoma nasuta	0	0	0	2	0	0	3	2	1	3
Macoma obliqua	0	0	0	1	0	1	0	0	2	0
Macoma sp. Juv.	7	8	2	5	24	4	15	27	5	21
Macoma yoldiformis	8	0	1	0	1	0	0	0	0	0
Megacrenella columbiana	0	0	0	0	1	0	0	0	0	0
Melanella sp. Indet.	0	0	0	0	0	0	0	0	0	0
Melanochlamys diomedea	0	0	0	0	0	0	1	0	1	0
Mitrella tuberosa	0	0	0	1	0	0	0	0	0	0
Musculus sp. Indet.	0	0	0	0	0	0	0	0	0	0
Mya arenaria	0	0	0	0	0	0	0	0	0	0
Mya sp. Indet.	0	0	0	0	0	0	0	0	0	0
Mya pseudoarenaria	0	0	0	1	0	0	0	0	0	0
Mysella sp. A	0	0	0	0	0	0	0	0	0	0
Mysella tumida	5	0	3	28	59	0	12	77	38	43
Mytilus edulis	0	0	0	0	0	0	0	0	0	0
Mytilidae sp. Juv.	1	0	0	0	2	2	0	2	0	0
Nassarius mendicus	0	0	0	0	0	0	0	0	0	0
Natica clausa	1	0	0	0	0	0	0	0	0	0
Nemocardium centrifilosum	0	0	1	0	0	0	0	0	0	0
Nitidella gouldi	6	0	3	6	1	0	17	3	1	1
Nucula tenuis	3	0	1	1	0	0	0	1	0	0
Nudibranchia sp. Indet.	0	0	0	0	0	0	0	0	0	0
Odostomia sp. Indet.	3	1	0	3	1	0	2	8	4	6
Onchidoris sp.Juv.	0	0	0	0	0	0	0	0	0	0
Pandora filosa	0	0	0	2	2	0	0	0	0	0
Panopea abrupta	0	0	0	0	0	0	0	0	0	0
Parvilucina tenuisculpta	15	0	0	8	3	1	5	12	8	2
Pododesmus macrochisma	0	0	0	0	0	0	0	0	0	0
Polinices pallidus	0	0	0	0	0	0	0	0	0	0
Polinices sp.Juv.	0	0	0	0	0	0	0	0	0	0
Protothaca staminea	0	0	0	0	0	0	0	1	0	0
Psephidia lordi	59	15	10	91	135	8	152	79	25	66
Rictaxis punctocaelatus	0	0	0	0	0	0	0	0	0	0
Saxidomus giganteus	2	0	0	1	0	0	0	0	0	0
Solen sicarius	1	0	0	0	0	0	0	0	0	0
Tellina modesta	0	0	0	0	0	0	0	1	0	0
Tellina sp. Juv.	0	0	0	0	1	0	0	4	0	5
Tellinidae sp. Indet.	0	0	0	0	0	0	0	0	0	0
Thyasira gouldi	0	0	1	0	0	0	0	0	0	0
Tresus capax	0	0	0	0	0	0	0	0	0	0
Tresus sp.Indet.	0	1	0	0	0	0	0	0	0	0
Turbonilla sp. Indet.	40	20	13	23	8	2	19	16	12	30
Turridae sp. Indet.	0	1	0	0	0	0	0	0	0	0
Xylophaga washingtona	0	0	0	0	0	0	0	0	0	0
Abundance										
Richness	22	11	16	23	17	11	16	20	13	16

MOLLUSCA	Total HY22I	Total HY23I	Total HY24I	Total HY25I	Total HY26I	Total HY27I	Total HY28I	Total HY30I	Total HY35I	Total CR2I
Acila castrensis	0	0	0	0	0	0	0	0	18	0
Acteocina culcitella	0	0	0	0	0	0	0	0	0	15
Adontorhina cyclia	0	0	0	0	0	0	0	0	3	0
Aeolidacea sp. juv.	0	0	0	0	0	0	0	1	0	0
Alvania compacta	16	12	3	3	1	0	0	6	14	0
Axinopsida serricata	414	339	59	94	21	72	105	26	37	2
Barleeia subtenuis	0	0	0	0	0	0	0	0	0	0
Bivalvia sp. Indet.	0	0	0	0	0	0	0	0	0	2
Bivalvia sp. Juv.	1	0	0	1	2	0	2	3	2	0
Cardiidae sp. juv.	0	0	0	0	0	0	0	1	0	0
Cardiomya pectinata	0	0	0	0	0	0	0	0	0	0
Chaetodermatidae	0	0	0	0	0	0	0	0	0	1
Clinocardium nuttali	1	0	0	0	0	0	1	0	0	0
Clinocardium sp. Juv.	0	0	0	1	0	0	1	0	1	0
Compsomyax subdiaphana	0	0	0	0	0	0	0	0	1	3
Corambe pacifica	0	0	0	0	0	0	0	0	0	0
Crepipatella lingulata	0	0	0	0	0	0	0	12	95	0
Cuthona sp. Indet.	0	0	0	0	0	0	0	0	0	0
Cyclocardia ventricasa	0	0	0	0	0	0	0	0	0	0
Cylichna attonsa	0	0	0	0	0	0	0	0	0	3
Diaphana sp. Indet.	0	0	0	0	0	0	0	0	0	0
Doridoidea sp. Juv.	1	0	0	0	0	0	0	0	0	0
Flabellina sp.Indet.	0	0	0	0	1	0	0	0	0	0
Gastropoda sp. Indet.	0	0	1	0	0	0	0	1	0	0
Gastropteron pacificum	0	0	0	0	0	0	0	0	0	0
Haminoea vesicula	0	0	0	0	0	0	0	0	0	0
Hiatella arctica	0	0	0	0	0	0	0	2	2	1
Kurtzia arteaga	0	0	0	0	0	0	0	0	3	15
Lacuna vincta	0	0	0	0	0	0	0	0	0	0
Lasaea subviridis	0	0	0	0	0	0	0	0	0	0
Lucinidae sp.Juv.	0	0	0	0	0	0	0	0	0	0
Lucinoma annulatum	1	4	0	0	0	0	0	5	0	0
Lyonsia californica	4	0	0	0	0	0	0	3	10	7
Lyonsia sp. Juv.	0	0	0	0	0	0	0	0	0	0
Macoma calcarea	0	0	0	0	0	0	0	0	13	4
Macoma carlottensis	28	6	1	3	0	0	0	0	15	0
Macoma nasuta	1	2	1	0	0	0	0	1	0	3
Macoma obliqua	1	1	0	0	0	0	1	2	28	7
Macoma sp. Juv.	18	25	4	2	1	3	0	37	26	39
Macoma yoldiformis	0	0	0	0	0	0	0	4	11	25
Megacrenella columbiana	0	2	0	0	0	0	0	9	16	0
Melanella sp. Indet.	0	0	0	0	0	0	0	0	6	0
Melanochlamys diomedea	0	0	0	0	0	0	0	0	0	1
Mitrella tuberosa	0	0	0	0	0	0	0	0	0	0
Musculus sp. Indet.	0	0	0	0	0	0	0	0	1	0
Mya arenaria	0	0	0	0	0	0	0	0	0	0
Mya sp. Indet.	0	0	0	0	0	0	0	0	0	0
Mya pseudoarenaria	0	0	0	0	0	0	0	0	0	0
Myselia sp. A	0	0	0	0	0	0	0	0	0	39
Myselia tumida	36	79	4	1	1	1	1	39	10	1576
Mytilus edulis	0	0	1	0	0	0	0	0	0	0
Mytilidae sp. Juv.	2	0	0	0	2	0	0	1	0	2
Nassarius mendicus	0	0	0	0	0	0	0	0	0	2
Natica clausa	0	0	0	0	0	0	0	0	0	0
Nemocardium centrifilosum	0	0	0	0	0	0	0	0	0	0
Nitidella gouldi	0	0	0	0	0	0	0	5	0	1
Nucula tenuis	0	0	0	0	0	0	0	1	6	0
Nudibranchia sp. Indet.	0	0	0	0	0	0	1	1	0	0
Odostomia sp. Indet.	3	5	1	2	0	2	0	2	0	7
Onchidoris sp.Juv.	0	0	0	0	0	0	0	0	0	1
Pandora filosa	0	0	0	0	0	0	0	0	0	0
Panopea abrupta	0	0	0	0	0	0	0	0	0	0
Parvilucina tenuisculpta	2	5	0	0	0	0	0	28	118	52
Pododesmus macrochisma	0	0	0	0	0	0	0	0	1	0
Polinices pallidus	0	0	0	0	0	0	0	0	1	0
Polinices sp.Juv.	0	0	0	0	0	0	0	0	0	2
Protothaca staminea	0	0	0	0	0	0	0	0	0	1
Psephidia lordi	84	18	0	8	1	0	1	1	21	76
Rictaxis punctocaelatus	0	0	0	0	0	0	0	0	1	3
Saxidomus giganteus	0	1	0	0	0	0	0	0	2	3
Solen sicarius	0	0	0	0	0	0	0	0	0	0
Tellina modesta	0	0	0	0	0	0	0	0	0	15
Tellina sp. Juv.	2	2	0	0	0	0	0	3	0	29
Tellinidae sp. Indet.	0	0	0	0	0	0	0	0	0	1
Thyasira gouldi	0	1	0	0	0	0	0	0	2	0
Tresus capax	0	0	0	0	0	0	0	0	4	0
Tresus sp.Indet.	0	0	0	1	0	0	0	0	0	0
Turbonilla sp. Indet.	10	9	0	0	0	0	0	31	33	21
Turridae sp. Indet.	0	0	0	0	0	0	0	0	0	0
Xylophaga washingtona	0	0	0	0	0	0	0	0	0	0
Abundance										
Richness	18	16	9	10	8	4	8	25	30	32

MOLLUSCA	Total CR2Al	Total
Acila castrensis	0	18
Acteocina culcitella	3	18
Adontorhina cyclia	0	6
Aeolidacea sp. juv.	0	2
Alvania compacta	0	271
Axinopsida serricata	3	4747
Barleeia subtenuis	0	2
Bivalvia sp. Indet.	0	2
Bivalvia sp. Juv.	1	18
Cardiidae sp. juv.	0	1
Cardiomya pectinata	0	3
Chaetodermatidae	0	8
Clinocardium nuttali	0	24
Clinocardium sp. Juv.	0	7
Compsomyax subdiaphana	1	100
Corambe pacifica	1	1
Crepipatella lingulata	0	107
Cuthona sp. Indet.	0	1
Cyclocardia ventricasa	0	1
Cylichna attonsa	10	14
Diaphana sp. Indet.	0	1
Doridoidea sp. Juv.	0	2
Flabellina sp.Indet.	0	1
Gastropoda sp. Indet.	0	4
Gastropteron pacificum	0	1
Haminoea vesicula	0	1
Hiatella arctica	0	10
Kurtzia arteaga	0	31
Lacuna vincta	0	1
Lasaea subviridis	0	1
Lucinidae sp.Juv.	0	1
Lucinoma annulatum	0	57
Lyonsia californica	0	425
Lyonsia sp. Juv.	0	2
Macoma calcarea	0	29
Macoma carlottensis	0	174
Macoma nasuta	0	19
Macoma obliqua	0	46
Macoma sp. Juv.	4	405
Macoma yoldiformis	0	61
Megacrenella columbiana	0	73
Melanella sp. Indet.	0	10
Melanochlamys diomedea	0	7
Mitrella tuberosa	0	1
Musculus sp. Indet.	0	1
Mya arenaria	0	3
Mya sp. Indet.	0	1
Mya pseudoarenaria	0	17
Mysella sp. A	0	40
Mysella tumida	33	2073
Mytilus edulis	0	3
Mytilidae sp. Juv.	1	35
Nassarius mendicus	0	3
Natica clausa	0	2
Nemocardium centrifilosum	0	54
Nitidella gouldi	0	183
Nucula tenuis	1	20
Nudibranchia sp. Indet.	0	2
Odostomia sp. Indet.	0	97
Onchidoris sp.Juv.	0	1
Pandora filosa	0	9
Panopea abrupta	0	1
Parvilucina tenuisculpta	0	361
Pododesmus macrochisma	0	1
Polinices pallidus	0	1
Polinices sp.Juv.	0	2
Protothaca staminea	0	7
Psephidia lordi	0	1136
Rictaxis punctocaelatus	1	21
Saxidomus giganteus	0	26
Solen sicarius	0	20
Tellina modesta	0	16
Tellina sp. Juv.	0	47
Tellinidae sp. Indet.	0	1
Thyasira gouldi	0	5
Tresus capax	0	4
Tresus sp.Indet.	0	2
Turbonilla sp. Indet.	0	826
Turridae sp. Indet.	0	1
Xylophaga washingtona	0	1
Abundance		
Richness	80	80

Crustacean Abundance Data

ARTHROPODA	HY1I-1	HY1I-2	HY1I-3	HY1I-4	HY2I-1	HY2I-2	HY2I-3	HY2I-7
Ampelisca agassizi								
Ampelisca hancocki	1	1	1	1				2
Anisogammarus pugettensis								
Aoroides sp.		1				2		
Argissa hamatipes								
Balanus sp.	1	3		22	1			
Bathyleberis sp.								
Byblis millsi	2		2	4	1	9	5	6
Byblis sp.								
Callianassa sp.								
Campylaspis sp.								
Cancer gracilis						1		
Caprellidae								
Copepoda								
Corophium sp.								
Crangon alaskensis	2							
Crangon zacae								
Decapoda						2		
Diastylis sp.		1			1	3		
Dyopedos sp.								
Eualus pusiolus								
Eudorella pacifica				1	2			
Euphilomedes carcharodonta	31	13	35	46	26	10	34	26
Euphilomedes producta	7	3	12	14	9	5	6	9
Eusirus sp.								
Gammaridae								
Heterophoxus oculatus	1	2	5	2				3
Hyperiidae								
Lamprops quadriplicata								
Leptochelia savignyi	1			1	1	1	1	3
Leptognathia sp.	1		1	1				
Leucon sp.								
Limnoria sp.								
Lophopanopeus bellus diegensis								
Melita sp.								
Monoculodes norvegicus								
Monoculodes sp.					1			
Munna ubiquita						1		
Nebalia sp.								
Orchomene cf. pinguis								
Orchomene decipiens								
Orchomene sp.								
Paguridae								
Photis sp.								
Pinnixa schmitti								
Pinnixa sp.			3	2		6	2	
Pleusymtes sp.				1				1
Protomedeia sp.								
Pugettia sp.								
Pycnogonida								
Rhepoxynius dabolus								
Rutiderma lomae								
Silophasma geminatum								
Sympleustes Sp.								
Synchelidium shoemakeri				1		2		
Westwoodilla caecula		4	1	2		1	1	3
Abundance	47	28	60	98	42	43	49	53
Richness								

ARTHROPODA	HY3I-1	HY3I-2	HY3I-3	HY3I-7	HY4I-4	HY4I-5	HY4I-6	HY4I-7
Ampelisca agassizi								
Ampelisca hancocki				2	1			
Anisogammarus pugettensis	2			2				
Aoroides sp.	3		1	2	1			1
Argissa hamatipes								
Balanus sp.				2	1	1	6	
Bathyleberis sp.		2	1					
Byblis millsi	2	2		4	1	3	1	1
Byblis sp.								
Callianassa sp.								
Campylaspis sp.								
Canoor gracilis								
Caprellidae								
Copepoda								
Corophium sp.								
Crangon alaskensis						1		
Crangon zacae							1	
Decapoda								
Diastylis sp.	3	2	3					1
Dyopedos sp.								
Eualus pusiolus				1				
Eudorella pacifica			1					
Euphilomedes carcharodonta	25	37	11	11			1	
Euphilomedes producta	5	13	5	4				2
Eusirus sp.				2				
Gammaridae								
Heterophoxus oculatus								
Hyperiidae								
Lamprops quadriplicata								
Leptochelia savignyi	4	5	6	4				
Leptognathia sp.								
Leucon sp.								
Limnoria sp.								
Lophopanopeus bellus diegensis				1				
Melita sp.								
Monoculodes norvegicus		1	1				1	
Monoculodes sp.								
Munna ubiquita		1						
Nebalia sp.								
Orchomene cf. pinguis								
Orchomene decipiens								
Orchomene sp.								
Paguridae								
Photis sp.								
Pinnixa schmitti								
Pinnixa sp.	4	12	7	1				
Plausymtas sp.	1			2				
Protomedeia sp.								
Pugettia sp.								
Pycnogonida								
Rhepoxynius dabolus								
Rutiderma lomae								
Silophasma geminatum								
Sympleustes Sp.								
Synoholidium ohoomakori			1				2	
Westwoodilla caecula	1	3	7	1			1	
Abundance	50	78	44	39	4	5	13	5
Richness								

ARTHROPODA	HY5I-1	HY5I-2	HY5I-4	HY5I-6	HY6I-1	HY6I-3	HY6I-6	HY6I-7
Ampelisca agassizi								
Ampelisca hancocki								
Anisogammarus pugettensis								
Aoroides sp.	2					1		
Argissa hamatipes								
Balanus sp.			4	7			44	8
Bathyleberis sp.	2		3				1	
Byblis millsi	2	2	3		1	4	4	1
Byblis sp.								
Callianassa sp.								
Campylaspis sp.				1		1		
Cancer gracilis								
Caprellidae								
Copepoda								
Corophium sp.								
Crangon alaskensis						1		
Crangon zacae								
Decapoda								
Diastylis sp.					1			
Dyopedos sp.								
Eualus pusiolus			1					
Eudorella pacifica	3		4	3		1		
Euphilomedes carcharodonta	9	21	10	15	8	14	4	3
Euphilomedes producta	8	5	6	6	1	5	1	
Eusirus sp.								
Gammaridae								
Heterophoxus oculatus								
Hyperiidae								
Lamprops quadriplicata								
Leptochelia savignyi			3	3	1	1		
Leptognathia sp.								
Leucon sp.								
Limnoria sp.								
Lophopanopeus bellus diegensis								
Melita sp.				3	1	1		
Monoculodes norvegicus		1	1	2				
Monoculodes sp.						1		1
Munna ubiquita				1		1		
Nebalia sp.								
Orchomene cf. pinguis								
Orchomene decipiens								
Orchomene sp.								
Paguridae								
Photis sp.								
Pinnixa schmitti								
Pinnixa sp.			1			2	1	1
Pleusymtes sp.	3		1	2		1	1	
Protomedeia sp.								
Pugettia sp.								
Pycnogonida								
Rhepoxynius daboius								
Rutiderma lomae								
Silophasma geminatum								
Sympleustes Sp.					1			
Synchelidium ehoomakori	2		5	8		2		1
Westwoodilla caecula	1		1	2	3	2	8	
Abundance	32	29	43	53	17	38	64	15
Richness								

ARTHROPODA	HY7I-1	HY7I-2	HY7I-3	HY7I-6	HY8I-1	HY8I-4	HY8I-5	HY8I-7
Ampelisca agassizi								
Ampelisca hancocki	1							
Anisogammarus pugettensis					1			
Aoroides sp.		1				1		
Argissa hamatipes	1							
Balanus sp.	7	1	16		1			
Bathyleberis sp.	1							
Byblis millsi	2	4	3				1	
Byblis sp.								
Callianassa sp.								
Campylaspis sp.								
Cancer gracilis								
Caprellidae								
Copepoda								
Corophium sp.								
Crangon alaskensis					1			
Crangon zacae								
Decapoda								
Diastylis sp.		3						
Dyopedos sp.								
Eualus pusiolus								
Eudorella pacifica				1				4
Euphilomedes carcharodonta	17	11	17	3	3	2	2	8
Euphilomedes producta	6	7	1		2	4	2	4
Eusirus sp.								
Gammaridae								
Heterophoxus oculatus								
Hyperiidae								
Lamprops quadriplicata								
Leptochelia savignyi							1	
Leptognathia sp.								
Leucon sp.								
Limnoria sp.								
Lophopanopeus bellus diegensis								
Melita sp.								
Monoculodes norvegicus								
Monoculodes sp.								
Munna ubiquita								
Nebalia sp.								
Orchomene cf. pinguis								
Orchomene decipiens								
Orchomene sp.								
Paguridae								
Photis sp.								
Pinnixa schmitti								
Pinnixa sp.	2	1		1				
Pleusymtes sp.	1		1			2	1	2
Protomedeia sp.								
Pugettia sp.								
Pycnogonida								
Rhepoxynius dabolus								
Rutiderma lomae								
Siliophasma geminatum								
Sympleustes Sp.								
Synchelidium shoemakeri			2	5	2			2
Westwoodilla caecula	2				1			
Abundance	40	28	40	10	11	9	7	20
Richness								

ARTHROPODA	HY9I-1	HY9I-2	HY9I-3	HY9I-4	HY10I-3	HY10I-5	HY10I-6	HY10I-7
Ampelisca agassizi								
Ampelisca hancocki								
Anisogammarus pugettensis								
Aoroides sp.			1					
Argissa hamatipes								
Balanus sp.			1	1			1	6
Bathyleberis sp.					1			
Byblis millsi				1	2	1		
Byblis sp.	1							
Callianassa sp.								
Campylaspis sp.	1					1		
Cancer gracilis						1		
Caprellidae								
Copepoda								
Corophium sp.								
Crangon alaskensis							1	
Crangon zacae								
Decapoda								
Diastylis sp.						1		
Dyopedos sp.								
Eualus pusiolus								
Eudorella pacifica	2			1	6	3		
Euphilomedes carcharodonta	14	3	13	8	8	17	6	7
Euphilomedes producta	4	3	4	7	13	16	1	2
Eusirus sp.								
Gammaridae								
Heterophoxus oculatus								
Hyperiidae								
Lamprops quadriplicata								
Leptochelia savignyi			1			1		
Leptognathia sp.								
Leucon sp.				1				
Limnoria sp.								
Lophopanopeus bellus diegensis								
Melita sp.			1	1			2	
Monoculodes norvegicus								
Monoculodes sp.	1							
Munna ubiquita						1		
Nebalia sp.								
Orchomene cf. pinguis								
Orchomene decipiens							2	
Orchomene sp.								
Paguridae								
Photis sp.						1		
Pinnixa schmitti								
Pinnixa sp.						1		1
Pleusymtes sp.				1	2	3	1	2
Protomedeia sp.								
Pugettia sp.								
Pycnogonida								
Rhepoxynius daboius								
Rutiderma lomae								
Silophasma geminatum								
Sympleustes Sp.								
Synchelidium shoemakeri	1				1			
Westwoodilla caecula						1		1
Abundance	24	6	21	21	33	48	14	19
Richness								

ARTHROPODA	HY11I-1	HY11I-3	HY11I-4	HY11I-7	HY12I-1	HY12I-4	HY12I-5	HY12I-6
Ampelisca agassizi								
Ampelisca hancocki								
Anisogammarus pugettensis								
Aoroides sp.							1	
Argissa hamatipes								
Balanus sp.						1	1	
Bathyleberis sp.							1	
Bybils millsi			1			1		1
Bybils sp.								
Callianassa sp.								
Campylaspis sp.								
Cancer gracilis								
Caprellidae								
Copepoda								
Corophium sp.								
Crangon alaskensis								
Crangon zacae								
Decapoda								
Diastylis sp.	1					2		
Dyopedos sp.			2					
Eualus pusiolus								
Eudorella pacifica	1		6			4	5	
Euphilomedes carcharodonta	9		5	7	10	21	12	8
Euphilomedes producta	4	2	10	4	9	24	26	
Eusirus sp.								
Gammaridae								
Heterophoxus oculatus								
Hyperiidae								
Lamprops quadriplicata								
Leptochelia savignyi	3			5	2	2	2	1
Leptognathia sp.								
Leucon sp.								
Limnoria sp.								
Lophopanopeus bellus diegensis								
Melita sp.			1	1				
Monoculodes norvegicus								
Monoculodes sp.								
Munna ubiquita	1							
Nebalia sp.								
Orchomene cf. pinguis								
Orchomene decipiens								
Orchomene sp.								
Paguridae								
Photis sp.								
Pinnixa schmitti			1					
Pinnixa sp.	1	1	1	2	1	1		
Pleusymtes sp.				1	2			2
Protomedeia sp.								
Pugettia sp.								
Pycnogonida								
Rhopoxynius dabolus								
Rutiderma lomae								
Silophasma geminatum								
Sympleustes Sp.								
Synchelidium shoemakeri								
Westwoodilla caecula			2			1	1	
Abundance	20	3	29	20	24	57	49	12
Richness								

ARTHROPODA	HY13I-1	HY13I-2	HY13I-6	HY13I-7	HY14I-1	HY14I-2	HY14I-3	HY14I-7
Ampelisca agassizi								
Ampelisca hancocki								
Anisogammarus pugettensis								
Aoroides sp.								
Argissa hamatipes								
Balanus sp.								
Bathyleberis sp.					1			
Byblis millsi				1				
Byblis sp.								
Callianassa sp.								
Campylaspis sp.								
Cancer gracilis								
Caprellidae								
Copepoda								
Corophium sp.								
Crangon alaskensis				1				
Crangon zacae								
Decapoda								
Diastylis sp.	1							
Dyopedos sp.								
Eualus pusiolus								
Eudorella pacifica								
Euphilomedes carcharodonta	3		4	2	2	1		6
Euphilomedes producta				3		3	1	
Eusirus sp.								
Gammaridae								
Heterophoxus oculatus								
Hyperiidae								
Lamprops quadriplicata								
Leptochelia savignyi			3	3		2	1	
Leptognathia sp.								
Leucon sp.					1			
Limnoria sp.			8	25				
Lophopanopeus bellus diegensis								
Melita sp.	1		4				1	1
Monoculodes norvegicus								
Monoculodes sp.								
Munna ubiquita								
Nebalia sp.								
Orchomene cf. pinguis								
Orchomene decipiens								
Orchomene sp.			5					
Paguridae								
Photis sp.								
Pinnixa schmitti								
Pinnixa sp.							1	
Pleusymtes sp.				2				
Protomedeia sp.								
Pugettia sp.								
Pycnogonida								
Rhepoxynius daboius								
Rutiderma lomae								
Silophasma geminatum								
Sympleustes Sp.								
Synchelidium shoemakeri	1				1			
Westwoodilla caecula								
Abundance	6	0	24	37	5	6	4	7
Richness								

ARTHROPODA	HY15I-1	HY15I-3	HY15I-4	HY15I-5	HY16I-2	HY16I-3	HY16I-4	HY16I-6
Ampelisca agassizi								
Ampelisca hancocki								
Anisogammarus pugettensis								
Aoroides sp.								
Argissa hamatipes								
Balanus sp.								
Bathyleberis sp.								
Bybilis millsi								
Bybilis sp.								
Callianassa sp.								
Campylaspis sp.								
Cancer gracilis								
Caprellidae								
Copepoda								
Corophium sp.								
Crangon alaskensis								
Crangon zacae								
Decapoda								
Diastylis sp.			1	1				
Dyopedos sp.								
Eualus pusiolus								
Eudorella pacifica	3	6	2	1	6	4	10	4
Euphilomedes carcharodonta	6	3	12	5	2	6	12	14
Euphilomedes producta	1	4	4	4	3		4	3
Eusirus sp.								
Gammaridae								
Heterophoxus oculatus								
Hyperiidae								
Lamprops quadriplicata								
Leptochelia savignyi		2			2		3	
Leptognathia sp.								
Leucon sp.								
Limnoria sp.							1	
Lophopanopeus bellus diegensis								
Melita sp.								3
Monoculodes norvegicus								
Monoculodes sp.								
Munna ubiquita								
Nebalia sp.								
Orchomene cf. pinguis								
Orchomene decipiens								
Orchomene sp.								
Paguridae								
Photis sp.								
Pinnixa schmitti		2						
Pinnixa sp.		1						
Pleusymtes sp.			1	1				
Protomedeia sp.								
Pugettia sp.								
Pycnogonida								
Rhepoxynius daboius								
Rutiderma lomae								
Silophasma geminatum								
Sympleustes Sp.								
Synchelidium shoemakeri		2	1			4	15	4
Westwoodilla caecula			1				1	2
Abundance	10	20	22	12	13	14	46	30
Richness								

ARTHROPODA	HY17I-1	HY17I-2	HY17I-5	HY17I-6	HY18I-1	HY18I-2	HY18I-4	HY18I-5
Ampelisca agassizi								
Ampelisca hancocki								
Anisogammarus pugettensis								
Aoroides sp.			1					
Argissa hamatipes								
Balanus sp.	1							
Bathyleberis sp.								
Byblis millsi								
Byblis sp.								
Callianassa sp.								
Campylaspis sp.								
Cancer gracilis								
Caprellidae								
Copepoda								
Corophium sp.								
Crangon alaskensis								
Crangon zacae								
Decapoda								
Diastylis sp.						1		
Dyopedos sp.								
Eualus pusiolus								
Eudorella pacifica		1			4	2	7	
Euphilomedes carcharodonta	1			3	26	21	34	22
Euphilomedes producta					14	2	6	4
Eusirus sp.								
Gammaridae								
Heterophoxus oculatus								
Hyperiidae								
Lamprops quadriplicata								
Leptochelia savignyi	2	1	1	1	13	18	9	9
Leptognathia sp.								
Leucon sp.								
Limnoria sp.				1				
Lophopanopeus bellus diegensis								
Melita sp.	1			4				1
Monoculodes norvegicus								
Monoculodes sp.								
Munna ubiquita					1			
Nebalia sp.								
Orchomene cf. pinguis								
Orchomene decipiens								
Orchomene sp.								
Paguridae								
Photis sp.								
Pinnixa schmitti								
Pinnixa sp.								
Pleusymtes sp.	1		1					
Protomedeia sp.								
Pugettia sp.								
Pycnogonida								
Rhepoxynius daboius								
Rutiderma lomae								
Silophasma geminatum								
Sympleustes Sp.							1	
Synchelidium shoemaker	1					1	2	2
Westwoodilla caecula			1	1				1
Abundance	7	2	4	10	58	45	59	39
Richness								

ARTHROPODA	HY19I-2	HY19I-3	HY19I-4	HY19I-5	HY20I-1	HY20I-2	HY20I-4	HY20I-5
Ampelisca agassizi								
Ampelisca hancocki								
Anisogammarus pugettensis								
Aoroides sp.				1				
Argissa hamatipes								
Balanus sp.								
Bathyleberis sp.								
Byblis millsi								
Byblis sp.								
Callianassa sp.								
Campylaspis sp.								
Cancer gracilis								
Caprellidae								
Copepoda								
Corophium sp.			1					
Crangon alaskensis						1		
Crangon zacae								
Decapoda								
Diastylis sp.								
Dyopedos sp.								
Eualus pusiolus								
Eudorella pacifica	9	2		2				2
Euphilomedes carcharodonta	26	2	17	13	3	2	8	5
Euphilomedes producta	17	2	11	9	3	1	3	4
Eusirus sp.								
Gammaridae								
Heterophoxus oculatus								
Hyperlidae								
Lamprops quadriplicata				1				
Leptochelia savignyi	7	1	6	8	5	6	2	3
Leptognathia sp.								
Leucon sp.			1					1
Limnoria sp.				1				
Lophopanopeus bellus diegensis								
Mellita sp.	3		3	1			1	1
Monoculodes norvegicus								
Monoculodes sp.								
Munna ubiquita								
Neballa sp.								
Orchomene cf. pinguis								
Orchomene decipiens					1			
Orchomene sp.			1					
Paguridae								
Photis sp.								
Pinnixa schmitti								
Pinnixa sp.				1	1		1	
Pleusymtes sp.	2		4	4			1	1
Protomedeia sp.								
Pugettia sp.								
Pycnogonida			1					
Rhepoxynius daboius								
Rutiderma lomae								
Silophasma geminatum								
Sympleustes Sp.								
Synchelidium shoemakeri				1	1			
Westwoodilla caecula				1				
Abundance	64	7	45	43	14	10	16	17
Richness								

ARTHROPODA	HY21I-1	HY21I-2	HY21I-4	HY21I-6	HY22I-1	HY22I-3	HY22I-5	HY22I-7
Ampelisca agassizi								
Ampelisca hancocki								
Anisogammarus pugettensis								
Aoroides sp.						1		
Argissa hamatipes								
Balanus sp.								
Bathyleberis sp.								
Byblis millsi								
Byblis sp.								
Callianassa sp.					1			
Campylaspis sp.								
Cancer gracilis								
Caprellidae								
Copepoda								
Corophium sp.					2			
Crangon alaskensis						1		
Crangon zacae								
Decapoda								
Diastylis sp.								
Dyopedos sp.								
Eualus pusiolus								
Eudorella pacifica					4	1		1
Euphilomedes carcharodonta		10	3	5	12	12	21	27
Euphilomedes producta		2		5	1	4	3	6
Eusirus sp.								
Gammaridae								
Heterophoxus oculatus								
Hyperiidae								
Lamprops quadriplicata								
Leptochelia savignyi	4	4	1	3	29	6	6	14
Leptognathia sp.								
Leucon sp.	1							
Limnoria sp.								
Lophopanopeus bellus diegensis								
Melita sp.				3	1		2	1
Monoculodes norvegicus								
Monoculodes sp.								
Munna ubiquita						1		1
Nebalia sp.								
Orchomene cf. pinguis								
Orchomene decipiens								
Orchomene sp.								
Paguridae								
Photis sp.								
Pinnixa schmitti								
Pinnixa sp.	1				1	2		
Pleusymtes sp.	1				3	2	2	
Protomedeia sp.								
Pugettia sp.								
Pycnogonida								
Rhepoxynius daboius								
Rutiderma lomae								
Silophasma geminatum								
Sympleustes Sp.								
Synchelidium shoemakeri	1			1	2			
Westwoodilla caecula				1				
Abundance	8	16	4	18	56	30	34	50
Richness								

ARTHROPODA	HY23I-1	HY23I-2	HY23I-4	HY23I-7	HY24I-1	HY24I-2	HY24I-3	HY24I-4
Ampelisca agassizi								
Ampelisca hancocki								
Anisogammarus pugettensis								
Aoroides sp.		1				9	2	11
Argissa hamatipes								
Balanus sp.						1		
Bathyleberis sp.								
Byblis millsi								
Byblis sp.								
Callianassa sp.							1	
Campylaspis sp.								
Cancer gracilis								
Caprellidae								
Copepoda				1				
Corophium sp.						1		
Crangon alaskensis							2	
Crangon zacae								
Decapoda								
Diastylis sp.								
Dyopedos sp.								
Eualus pusiolus								
Eudorella pacifica								
Euphilomedes carcharodonta	8		5	13				1
Euphilomedes producta	10	1	3	11				
Eusirus sp.								
Gammaridae								
Heterophoxus oculatus								
Hyperiidae								
Lamprops quadriplicata								
Leptochelia savignyi	25	30	12	144	3			
Leptognathia sp.								
Leucon sp.								
Limnoria sp.				1		1	1	
Lophopanopeus bellus diegensis								
Melita sp.	3	5	1	7	9	21	2	3
Monoculodes norvegicus								
Monoculodes sp.								
Munna ubiquita				2				
Nebalia sp.						2		5
Orchomene cf. pinguis		1		1		1	1	3
Orchomene decipiens								
Orchomene sp.								
Paguridae								
Photis sp.								
Pinnixa schmitti								
Pinnixa sp.	2	1	2	2		2		
Pleusymtes sp.	1	1	1					
Protomedeia sp.								
Pugettia sp.								
Pycnogonida								
Rhepoxynius daboius								
Rutiderma lomae								
Silophasma geminatum								
Sympleustes Sp.								
Synchelidium shoemakeri								
Westwoodilla caecula								
Abundance	49	40	24	182	12	38	9	23
Richness								

ARTHROPODA	HY25I-4	HY25I-5	HY25I-6	HY25I-7	HY26I-3	HY26I-5	HY26I-6	HY26I-7
Ampelisca agassizi								
Ampelisca hancocki								
Anisogammarus pugettensis								
Aoroides sp.	2		1	1				
Argissa hamatipes								
Balanus sp.								
Bathyleberis sp.								
Byblis millsi								
Byblis sp.								
Callianassa sp.								
Campylaspis sp.								
Cancer gracilis								
Caprellidae								
Copepoda								
Corophium sp.		1						
Crangon alaskensis								
Crangon zacae								
Decapoda								
Diastylis sp.								
Dyopedos sp.								
Eualus pusiolus		1						
Eudorella pacifica								
Euphilomedes carcharodonta								
Euphilomedes producta				1			1	
Eusirus sp.								
Gammaridae								
Heterophoxus oculatus								
Hyperiidae								
Lamprops quadriplicata								
Leptochelia savignyi		1	1	2			1	
Leptognathia sp.								
Leucon sp.	2							
Limnoria sp.			1	1			6	
Lophopanopeus bellus diegensis								
Melita sp.	3	2		1				
Monoculodes norvegicus								
Monoculodes sp.								
Munna ubiquita								
Nebalia sp.								
Orchomene cf. pinguis								
Orchomene decipiens								
Orchomene sp.								
Paguridae								
Photis sp.								
Pinnixa schmitti	5	1						
Pinnixa sp.			5	1			1	
Pleusymtes sp.	3	2	3	1				
Protomedeia sp.								
Pugettia sp.								
Pycnogonida								
Rhepoxynius daboius								
Rutiderma lomae								
Silophasma geminatum								
Sympleustes Sp.								
Synchelidium shoemakeri								
Westwoodilla caecula								
Abundance	15	8	11	8	0	0	9	0
Richness								

ARTHROPODA	HY27I-2	HY27I-3	HY27I-6	HY27I-7	HY28I-3	HY28I-5	HY28I-6	HY28I-7
Ampelisca agassizi								
Ampelisca hancocki								
Anisogammarus pugettensis								
Aoroidae sp.								
Argissa hamatipes								
Balanus sp.								
Bathyleberis sp.								
Byblis millsi								
Byblis sp.								
Callianassa sp.								
Campylaspis sp.								
Cancer gracilis								
Caprellidae								
Copepoda								
Corophium sp.								
Crangon alaskensis								
Crangon zacae								
Decapoda					1		1	
Diastylis sp.								
Dyopedos sp.								
Eualus pusiolus								
Eudorella pacifica								
Euphilomedes carcharodonta								
Euphilomedes producta								
Eusirus sp.								
Gammaridae						1		
Heterophoxus oculatus								
Hyperiidae								
Lamprops quadriplicata								
Leptochelia savignyi					1	2	1	
Leptognathia sp.								
Leucon sp.								
Limnoria sp.					2			7
Lophopanopeus bellus diegensis								
Melita sp.					4	2		2
Monoculodes norvegicus								
Monoculodes sp.								
Munna ubiquita								
Nebalia sp.								
Orchomene cf. pinguis						1	1	
Orchomene decipiens								
Orchomene sp.								
Paguridae								
Photis sp.								
Pinnixa schmitti								
Pinnixa sp.			2	2	1	2	1	2
Pleusymtes sp.	1			3				
Protomedeia sp.								
Pugettia sp.								
Pycnogonida								
Rhepoxynius daboius								
Rutiderma lomae								
Silophasma geminatum								
Sympleustes Sp.								
Synchelidium shoemakeri								
Westwoodilla caecula								
Abundance	1	0	2	5	9	8	4	11
Richness								

ARTHROPODA	HY30I-1	HY30I-2	HY30I-5	HY30I-6	HY35I-1	HY35I-4	HY35I-5	HY35I-7
Ampelisca agassizi		1						
Ampelisca hancocki								
Anisogammarus pugettensis								
Aoroides sp.			1		1	2		
Argissa hamatipes								
Balanus sp.			8	4	3	5	2	1
Bathyleberis sp.								
Byblis millsi	1				1	3	1	
Byblis sp.								
Callianassa sp.								
Campylaspis sp.								
Cancer gracilis								
Caprellidae						2		1
Copepoda								
Corophium sp.						1		
Crangon alaskensis							1	1
Crangon zacae								
Decapoda				2	3			1
Diastylis sp.	1		1					
Dyopedos sp.								1
Eualus pusiolus						8	2	11
Eudorella pacifica	1	1	3	3	12	4	33	15
Euphilomedes carcharodonta	28	21	58	9	14	28	64	10
Euphilomedes producta	16	6		3	2	16	23	13
Eusirus sp.								
Gammaridae								
Heterophoxus oculatus	7	5	16	23	10	2	7	3
Hyperiidae			1					
Lamprops quadriplicata								
Leptochelia savignyi	1	6	2	12		2	2	2
Leptognathia sp.								
Leucon sp.								
Limnoria sp.	1	8	1	1				
Lophopanopeus bellus diegensis		1	1		2	2	2	4
Melita sp.		1						
Monoculodes norvegicus								
Monoculodes sp.					1			
Munna ubiquita								
Nebalia sp.								
Orchomene cf. pinguis								
Orchomene decipiens								
Orchomene sp.						1		
Paguridae						1	2	
Photis sp.					1			
Pinnixa schmitti								
Pinnixa sp.					1	7	4	3
Plausymtes sp.							1	
Protomedeia sp.								
Pugettia sp.							1	
Pycnogonida								
Rhepoxynius daboius								
Rutiderma lomae							3	3
Silophasma geminatum								
Sympleustes Sp.								
Synoholidium choomakori	1							
Westwoodilla caecula	3			1				
Abundance	60	50	92	58	51	84	148	69
Richness								

ARTHROPODA	CR2I-1	CR2I-4	CR2I-5	CR2I-7	CR2AI-1	CR2AI-2	CR2AI-3	CR2AI-4
Ampelisca agassizi								
Ampelisca hancocki			1					
Anisogammarus pugettensis								
Aoroides sp.	1		5	2				
Argissa hamatipes								
Balanus sp.	1	32	16					
Bathyleberis sp.								
Byblis millsi								
Byblis sp.								
Callianassa sp.								
Campylaspis sp.								
Cancer gracilis								
Caprellidae								
Copepoda								
Corophium sp.								
Crangon alaskensis								
Crangon zacae								
Decapoda	1							
Diastylis sp.		2						
Dyopedos sp.								
Eualus pusiolus								
Eudorella pacifica	3	5	12	3				
Euphilomedes carcharodonta	20	6	21	4				
Euphilomedes producta								
Eusirus sp.								
Gammaridae								
Heterophoxus oculatus					8	2	8	5
Hyperiidae								
Lamprops quadriplicata								
Leptochelia savignyi								
Leptognathia sp.								
Leucon sp.	1							
Limnoria sp.								
Lophopanopeus bellus diegensis								
Melita sp.								
Monoculodes norvegicus								
Monoculodes sp.								
Munna ubiquita								
Nebalia sp.								
Orchomene cf. pinguis								
Orchomene decipiens								
Orchomene sp.								
Paguridae								
Photis sp.	1							
Pinnixa schmitti	44	18	89	50		1	1	
Pinnixa sp.			1		4	5		
Pleusymtes sp.	1							
Protomedeia sp.	11							
Pugettia sp.								
Pycnogonida								
Rhepoxynius daboius	21	6	26	14	43	43	31	54
Rutiderma lomae								
Silophasma geminatum			1	1				
Sympleustes Sp.								
Synchelidium shoemakeri								
Westwoodilla caecula								
Abundance	105	69	172	74	55	51	40	59
Richness								

ARTHROPODA	Total HY1I	Total HY2I	Total HY3I	Total HY4I	Total HY5I	Total HY6I
Ampelisca agassizi	0	0	0	0	0	0
Ampelisca hancocki	4	2	2	1	0	0
Anisogammarus pugettensis	0	0	4	0	0	0
Aoroides sp.	1	2	6	2	2	1
Argissa hamatipes	0	0	0	0	0	0
Balanus sp.	26	1	2	8	11	52
Bathyleberis sp.	0	0	3	0	5	1
Byblis millsi	8	21	8	6	7	10
Byblis sp.	0	0	0	0	0	0
Callianassa sp.	0	0	0	0	0	0
Campylaspis sp.	0	0	0	0	1	1
Cancer gracilis	0	1	0	0	0	0
Caprellidae	0	0	0	0	0	0
Copepoda	0	0	0	0	0	0
Corophium sp.	0	0	0	0	0	0
Crangon alaskensis	2	0	0	1	0	1
Crangon zacae	0	0	0	1	0	0
Decapoda	0	2	0	0	0	0
Diastylis sp.	1	4	8	1	0	1
Dyopedos sp.	0	0	0	0	0	0
Eualus pusiolus	0	0	1	0	1	0
Eudorella pacifica	1	2	1	0	10	1
Euphilomedes carcharodonta	125	96	84	1	55	29
Euphilomedes producta	36	29	27	2	25	7
Eusirus sp.	0	0	2	0	0	0
Gammaridae	0	0	0	0	0	0
Heterophoxus oculatus	10	3	0	0	0	0
Hyperiidae	0	0	0	0	0	0
Lamprops quadriplicata	0	0	0	0	0	0
Leptochelia savignyi	2	6	19	0	6	2
Leptognathia sp.	3	0	0	0	0	0
Leucon sp.	0	0	0	0	0	0
Limnoria sp.	0	0	0	0	0	0
Lophopanopeus bellus diegensis	0	0	1	0	0	0
Melita sp.	0	0	0	0	3	2
Monoculodes norvegicus	0	0	2	1	4	0
Monoculodes sp.	0	1	0	0	0	2
Munna ubiquita	0	1	1	0	1	1
Nebalia sp.	0	0	0	0	0	0
Orchomene cf. pinguis	0	0	0	0	0	0
Orchomene decipiens	0	0	0	0	0	0
Orchomene sp.	0	0	0	0	0	0
Paguridae	0	0	0	0	0	0
Photis sp.	0	0	0	0	0	0
Pinnixa schmitti	0	0	0	0	0	0
Pinnixa sp.	5	8	24	0	1	4
Pleusymtes sp.	1	1	3	0	6	2
Protomedeia sp.	0	0	0	0	0	0
Pugettia sp.	0	0	0	0	0	0
Pycnogonida	0	0	0	0	0	0
Rhepoxynius dabolus	0	0	0	0	0	0
Rutiderma lomae	0	0	0	0	0	0
Silophasma geminatum	0	0	0	0	0	0
Sympleustes Sp.	0	0	0	0	0	1
Synchelidium shoemakeri	1	2	1	2	15	3
Westwoodilla caecula	7	5	12	1	4	13
Abundance						
Richness	16	18	20	12	17	19

ARTHROPODA	Total HY7I	Total HY8I	Total HY9I	Total HY10I	Total HY11I	Total HY12I
Ampelisca agassizi	0	0	0	0	0	0
Ampelisca hancocki	1	0	0	0	0	0
Anisogammarus pugettensis	0	1	0	0	0	0
Aoroides sp.	1	1	1	0	0	1
Argissa hamatipes	1	0	0	0	0	0
Balanus sp.	24	1	2	7	0	2
Bathyleberis sp.	1	0	0	1	0	1
Byblis millsi	9	1	1	3	1	2
Byblis sp.	0	0	1	0	0	0
Callianassa sp.	0	0	0	0	0	0
Campylaspis sp.	0	0	1	1	0	0
Cancer gracilis	0	0	0	1	0	0
Caprellidae	0	0	0	0	0	0
Copepoda	0	0	0	0	0	0
Corophium sp.	0	0	0	0	0	0
Crangon alaskensis	0	1	0	1	0	0
Crangon zacae	0	0	0	0	0	0
Decapoda	0	0	0	0	0	0
Diastylis sp.	3	0	0	1	1	2
Dyopedos sp.	0	0	0	0	2	0
Eualus pusiolus	0	0	0	0	0	0
Eudorella pacifica	1	4	3	9	7	9
Euphilomedes carcharodonta	48	15	38	38	21	51
Euphilomedes producta	14	12	18	32	20	59
Eusirus sp.	0	0	0	0	0	0
Gammaridae	0	0	0	0	0	0
Heterophoxus oculatus	0	0	0	0	0	0
Hyperiidae	0	0	0	0	0	0
Lamprops quadriplicata	0	0	0	0	0	0
Leptochelia savignyi	0	1	1	1	8	7
Leptognathia sp.	0	0	0	0	0	0
Leucon sp.	0	0	1	0	0	0
Limnoria sp.	0	0	0	0	0	0
Lophopanopeus bellus diegensis	0	0	0	0	0	0
Melita sp.	0	0	2	2	2	0
Monoculodes norvegicus	0	0	0	0	0	0
Monoculodes sp.	0	0	1	0	0	0
Munna ubiquita	0	0	0	1	1	0
Nebalia sp.	0	0	0	0	0	0
Orchomene cf. pinguis	0	0	0	0	0	0
Orchomene decipiens	0	0	0	2	0	0
Orchomene sp.	0	0	0	0	0	0
Paguridae	0	0	0	0	0	0
Photis sp.	0	0	0	1	0	0
Pinnixa schmitti	0	0	0	0	1	0
Pinnixa sp.	4	0	0	2	5	2
Pleusymtes sp.	2	5	1	8	1	4
Protomedeia sp.	0	0	0	0	0	0
Pugettia sp.	0	0	0	0	0	0
Pycnogonida	0	0	0	0	0	0
Rhepoxynius daboius	0	0	0	0	0	0
Rutiderma lomae	0	0	0	0	0	0
Silophasma geminatum	0	0	0	0	0	0
Sympleustes Sp.	0	0	0	0	0	0
Synchelidium shoemakeri	7	4	1	1	0	0
Westwoodilla caecula	2	1	0	2	2	2
Abundance						
Richness	14	12	14	19	13	12

ARTHROPODA	Total HY13I	Total HY14I	Total HY15I	Total HY16I	Total HY17I	Total HY18I
Ampelisca agassizi	0	0	0	0	0	0
Ampelisca hancocki	0	0	0	0	0	0
Anisogammarus pugettensis	0	0	0	0	0	0
Aoroides sp.	0	0	0	0	1	0
Argissa hamatipes	0	0	0	0	0	0
Balanus sp.	0	0	0	0	1	0
Bathyleberis sp.	0	1	0	0	0	0
Byblis millsi	1	0	0	0	0	0
Byblis sp.	0	0	0	0	0	0
Callianassa sp.	0	0	0	0	0	0
Campylaspis sp.	0	0	0	0	0	0
Cancer gracilis	0	0	0	0	0	0
Caprellidae	0	0	0	0	0	0
Copepoda	0	0	0	0	0	0
Corophium sp.	0	0	0	0	0	0
Crangon alaskensis	1	0	0	0	0	0
Crangon zacae	0	0	0	0	0	0
Decapoda	0	0	0	0	0	0
Diastylis sp.	1	0	2	0	0	1
Dyopedos sp.	0	0	0	0	0	0
Eualus pusiolus	0	0	0	0	0	0
Eudorella pacifica	0	0	12	24	1	13
Euphilomedes carcharodonta	9	9	26	34	4	103
Euphilomedes producta	3	4	13	10	0	26
Eusirus sp.	0	0	0	0	0	0
Gammaridae	0	0	0	0	0	0
Heterophoxus oculatus	0	0	0	0	0	0
Hyperiidae	0	0	0	0	0	0
Lamprops quadriplicata	0	0	0	0	0	0
Leptochelia savignyi	6	3	2	5	5	49
Leptognathia sp.	0	0	0	0	0	0
Leucon sp.	0	1	0	0	0	0
Limnoria sp.	33	0	0	1	1	0
Lophopanopeus bellus diegensis	0	0	0	0	0	0
Melita sp.	5	2	0	3	5	1
Monoculodes norvegicus	0	0	0	0	0	0
Monoculodes sp.	0	0	0	0	0	0
Munna ubiquita	0	0	0	0	0	1
Nebalia sp.	0	0	0	0	0	0
Orchomene cf. pinguis	0	0	0	0	0	0
Orchomene decipiens	0	0	0	0	0	0
Orchomene sp.	5	0	0	0	0	0
Paguridae	0	0	0	0	0	0
Photis sp.	0	0	0	0	0	0
Pinnixa schmitti	0	0	2	0	0	0
Pinnixa sp.	0	1	1	0	0	0
Pleusymtes sp.	2	0	2	0	2	0
Protomedeia sp.	0	0	0	0	0	0
Pugettia sp.	0	0	0	0	0	0
Pycnogonida	0	0	0	0	0	0
Rhepoxynius daboius	0	0	0	0	0	0
Rutiderma lomae	0	0	0	0	0	0
Silophasma geminatum	0	0	0	0	0	0
Sympleustes Sp.	0	0	0	0	0	1
Synchelidium ehoomakori	1	1	3	23	1	5
Westwoodilla caecula	0	0	1	3	2	1
Abundance						
Richness	11	8	10	8	10	10

ARTHROPODA	Total HY19I	Total HY20I	Total HY21I	Total HY22I	Total HY23I	Total HY24I
Ampelisca agassizi	0	0	0	0	0	0
Ampelisca hancocki	0	0	0	0	0	0
Anisogammarus pugettensis	0	0	0	0	0	0
Aoroides sp.	1	0	0	1	1	22
Argissa hamatipes	0	0	0	0	0	0
Balanus sp.	0	0	0	0	0	1
Bathyleberis sp.	0	0	0	0	0	0
Byblis millsi	0	0	0	0	0	0
Byblis sp.	0	0	0	0	0	0
Callianassa sp.	0	0	0	1	0	1
Campylaspis sp.	0	0	0	0	0	0
Cancer gracilis	0	0	0	0	0	0
Caprellidae	0	0	0	0	0	0
Copepoda	0	0	0	0	1	0
Corophium sp.	1	0	0	2	0	1
Crangon alaskensis	0	1	0	1	0	2
Crangon zacae	0	0	0	0	0	0
Decapoda	0	0	0	0	0	0
Diastylis sp.	0	0	0	0	0	0
Dyopedos sp.	0	0	0	0	0	0
Eualus pusiolus	0	0	0	0	0	0
Eudorella pacifica	13	2	0	6	0	0
Euphilomedes carcharodonta	58	18	18	72	26	1
Euphilomedes producta	39	11	7	14	25	0
Eusirus sp.	0	0	0	0	0	0
Gammaridae	0	0	0	0	0	0
Heterophoxus oculatus	0	0	0	0	0	0
Hyperiidae	0	0	0	0	0	0
Lamprops quadriplicata	1	0	0	0	0	0
Leptochelia savignyi	22	16	12	55	211	3
Leptognathia sp.	0	0	0	0	0	0
Leucon sp.	1	1	1	0	0	0
Limnoria sp.	1	0	0	0	1	2
Lophopanopeus bellus diegensis	0	0	0	0	0	0
Melita sp.	7	2	3	4	16	35
Monoculodes norvegicus	0	0	0	0	0	0
Monoculodes sp.	0	0	0	0	0	0
Munna ubiquita	0	0	0	2	2	0
Nebalia sp.	0	0	0	0	0	7
Orchomene cf. pinguis	0	0	0	0	2	5
Orchomene decipiens	0	1	0	0	0	0
Orchomene sp.	1	0	0	0	0	0
Paguridae	0	0	0	0	0	0
Photis sp.	0	0	0	0	0	0
Pinnixa schmitti	0	0	0	0	0	0
Pinnixa sp.	1	2	1	3	7	2
Pleusymtes sp.	10	2	1	7	3	0
Protomedeia sp.	0	0	0	0	0	0
Pugettia sp.	0	0	0	0	0	0
Pycnogonida	1	0	0	0	0	0
Rhepoxynius daboius	0	0	0	0	0	0
Rutiderma lomae	0	0	0	0	0	0
Silophasma geminatum	0	0	0	0	0	0
Sympleustes Sp.	0	0	0	0	0	0
Synchelidium shoemakeri	1	1	2	2	0	0
Westwoodilla caecula	1	0	1	0	0	0
Abundance						
Richness	16	11	9	13	11	12

ARTHROPODA	Total HY25I	Total HY26I	Total HY27I	Total HY28I	Total HY30I	Total HY35I
Ampelisca agassizi	0	0	0	0	1	0
Ampelisca hancocki	0	0	0	0	0	0
Anisogammarus pugettensis	0	0	0	0	0	0
Aoroides sp.	4	0	0	0	1	3
Argissa hamatipes	0	0	0	0	0	0
Balanus sp.	0	0	0	0	12	11
Bathyleberis sp.	0	0	0	0	0	0
Byblis millei	0	0	0	0	1	5
Byblis sp.	0	0	0	0	0	0
Callianassa sp.	0	0	0	0	0	0
Campylaspis sp.	0	0	0	0	0	0
Cancer gracilis	0	0	0	0	0	0
Caprellidae	0	0	0	0	0	3
Copepoda	0	0	0	0	0	0
Corophium sp.	1	0	0	0	0	1
Crangon alaskensis	0	0	0	0	0	2
Crangon zacae	0	0	0	0	0	0
Decapoda	0	0	0	2	2	4
Diastylis sp.	0	0	0	0	2	0
Dyopedos sp.	0	0	0	0	0	1
Eualus pusiolus	1	0	0	0	0	21
Eudorella pacifica	0	0	0	0	8	64
Euphilomedes carcharodonta	0	0	0	0	116	116
Euphilomedes producta	1	1	0	0	25	54
Eusirus sp.	0	0	0	0	0	0
Gammaridae	0	0	0	1	0	0
Heterophoxus oculatus	0	0	0	0	51	22
Hyperiidae	0	0	0	0	1	0
Lamprops quadriplicata	0	0	0	0	0	0
Leptochelia savignyi	4	1	0	4	21	6
Leptognathia sp.	0	0	0	0	0	0
Leucon sp.	2	0	0	0	0	0
Limnoria sp.	2	6	0	9	11	0
Lophopanopeus bellus diegensis	0	0	0	0	2	10
Melita sp.	6	0	0	8	1	0
Monoculodes norvegicus	0	0	0	0	0	0
Monoculodes sp.	0	0	0	0	0	1
Munna ubiquita	0	0	0	0	0	0
Neballa sp.	0	0	0	0	0	0
Orchomene cf. pinguis	0	0	0	2	0	0
Orchomene decipiens	0	0	0	0	0	0
Orchomene sp.	0	0	0	0	0	1
Paguridae	0	0	0	0	0	3
Photis sp.	0	0	0	0	0	1
Pinnixa schmitti	6	0	0	0	0	0
Pinnixa sp.	6	1	4	6	0	15
Pleusymtes sp.	9	0	4	0	0	1
Protomedeia sp.	0	0	0	0	0	0
Pugettia sp.	0	0	0	0	0	1
Pycnogonida	0	0	0	0	0	0
Rhepoxynius daboius	0	0	0	0	0	0
Rutiderma lomae	0	0	0	0	0	6
Silophasma geminatum	0	0	0	0	0	0
Sympleustes Sp.	0	0	0	0	0	0
Synchelidium shoemakeri	0	0	0	0	1	0
Westwoodilla caecula	0	0	0	0	4	0
Abundance						
Richness	11	4	2	7	17	23

ARTHROPODA	Total CR2I	Total CR2AI	Total
Ampelisca agassizi	0	0	1
Ampelisca hancocki	1	0	11
Anisogammarus pugettensis	0	0	5
Aoroides sp.	8	0	60
Argissa hamatipes	0	0	1
Balanus sp.	49	0	210
Bathyleberis sp.	0	0	13
Byblis millsi	0	0	84
Byblis sp.	0	0	1
Callianassa sp.	0	0	2
Campylaspis sp.	0	0	4
Cancer gracilis	0	0	2
Caprellidae	0	0	3
Copepoda	0	0	1
Corophium sp.	0	0	6
Crangon alaskensis	0	0	13
Crangon zacae	0	0	1
Decapoda	1	0	11
Diastylis sp.	2	0	30
Dyopedos sp.	0	0	3
Eualus pusiolus	0	0	24
Eudorella pacifica	23	0	214
Euphilomedes carcharodonta	51	0	1262
Euphilomedes producta	0	0	514
Eusirus sp.	0	0	2
Gammaridae	0	0	1
Heterophoxus oculatus	0	23	109
Hyperiidae	0	0	1
Lamprops quadriplicata	0	0	1
Leptochelia savignyi	0	0	478
Leptognathia sp.	0	0	3
Leucon sp.	1	0	8
Limnoria sp.	0	0	67
Lophopanopeus bellus diegensis	0	0	13
Melita sp.	0	0	109
Monoculodes norvegicus	0	0	7
Monoculodes sp.	0	0	5
Munna ubiquita	0	0	11
Nebalia sp.	0	0	7
Orchomene cf. pinguis	0	0	9
Orchomene decipiens	0	0	3
Orchomene sp.	0	0	7
Paguridae	0	0	3
Photis sp.	1	0	3
Pinnixa schmitti	201	2	212
Pinnixa sp.	1	9	115
Pleusymtes sp.	1	0	78
Protomedeia sp.	11	0	11
Pugettia sp.	0	0	1
Pycnogonida	0	0	1
Rhepoxynius daboius	67	171	238
Rutiderma lomae	0	0	6
Silophasma geminatum	2	0	2
Sympleustes Sp.	0	0	2
Synchelidium shoemakeri	0	0	78
Westwoodilla caecula	0	0	64
Abundance			
Richness	15	0	56

Miscellaneous Benthic Abundance Data

MISCELLANEOUS TAXA	HY1I-1	HY1I-2	HY1I-3	HY1I-4	HY2I-1	HY2I-2	HY2I-3	HY2I-7
Alcyonidium sp.	P			P		P		P
Amphiodia sp.	17	3	7	7		5	4	5
Amphipholis sp.								
Amphipholis squamata						3		1
Amphiuridae	4	2	11	6		3		1
Aplousobranchia								
Ascidiacea		1						
Athecata								
Barentsia sp.				P				
Bowerbankia sp.						P		
Callopora whiteavesi								
Campanulariidae	P	P	P				P	P
Carinoma mutabilis								
Caulibugula sp.	P							
Cerebratulus sp.							1	
Crossaster papposus								
Cucumariidae								
Dendrobeania sp.								
Dendrochirotida								
Edwardsia sipunculoides	2	1	2					
Enteropneusta								
Eupentacta sp.			1			1		1
Euphysa ruthae								
Golfingia pugettensis						2		
Havelochia benti								
Hippothoa hyalina								
Lineidae								
Metridium sp.								
Micrura sp.	1	1				1		2
Mogula pugetiensis								
Nemertina				1	4		2	1
Ophiura lutkeni					1			
Ophiurida				7		1		
Paranemertes californica		1						
Paranemertes peregrina								
Pentamera pseudopopulifera								
Pentamera sp.								
Priapulus caudatus								
Pseudocnus sp.								
Ptilosarcus gurneyi								
Sipunculidae								
Stolidobranchia	1							
Stronglylocentrotus droebachiensis								
Stronglyocentrotus sp. juv								
Styela gibbsii								
Stylochus exiguus								
Tubulanus frenatus				1		1		
Tubulanus nothus								
Tubulanus polymorphus	2	4	3	5	1	3		1
Tubulanus sp.		1		1				
Tubulipora sp.								
Virgularia sp.								
NEMATODA	9	5	3	6		4	1	21
Abundance	36	19	27	34	6	24	8	33
Richness								

MISCELLANEOUS TAXA	HY3I-1	HY3I-2	HY3I-3	HY3I-7	HY4I-4	HY4I-5	HY4I-6	HY4I-7
Alcyonidium sp.								
Amphiodia sp.		1	1		1		1	
Amphipholis sp.								
Amphipholis squamata				1				
Amphiuridae								
Aplousobranchia								
Ascidiacea								
Athecata								
Barentsia sp.								
Bowerbankia sp.								
Callopora whiteavesi								
Campanulariidae		P	P		P		P	
Carinoma mutabilis								
Caulibugula sp.								
Cerebratulus sp.							P	
Crossaster papposus								
Cucumariidae								
Dendrobeania sp.								
Dendrochirotida								
Edwardsia sipunculoides		1	1		1		3	1
Enteropneusta								
Eupentacta sp.		1	1		1		1	
Euphysa ruthae								
Goltingia pugettensis								
Havelochia benti								
Hippothoa hyalina								
Lineidae								
Metridium sp.								
Micrura sp.		1						
Mogula pugetiensis								
Nemertina		8	5				1	
Ophiura lutkeni								
Ophiurida		10	9	1	2	1		
Paranemertes californica								
Paranemertes peregrina								
Pentamera pseudopopulifera								
Pentamera sp.								
Priapulus caudatus								
Pseudocnus sp.								
Ptilosarcus gurneyi								
Sipunculidae								
Stolidobranchia								
Strongylocentrotus droebachiensis								
Strongylocentrotus sp. juv								
Styela gibbsii								
Stylochus exiguus								
Tubulanus frenatus								
Tubulanus nothus								
Tubulanus polymorphus			1	1				
Tubulanus sp.								
Tubulipora sp.								
Virgularia sp.								
NEMATODA			22	3		14	1	
Abundance	0	22	40	6	5	15	7	1
Richness								

MISCELLANEOUS TAXA	HY5I-1	HY5I-2	HY5I-4	HY5I-6	HY6I-1	HY6I-3	HY6I-6	HY6I-7
Alcyonidium sp.								P
Amphiodia sp.	1							
Amphipholis sp.								
Amphipholis squamata				?				
Amphiuridae						2		
Aplousobranchia								
Ascidiacea								
Athecata								
Barentsia sp.								
Bowerbankia sp.								
Callopora whiteavesi								
Campanulariidae								P
Carinoma mutabilis								
Caulibugula sp.								
Cerebratulus sp.								
Crossaster papposus								
Cucumariidae								
Dendrobeania sp.								
Dendrochirotida						1		1
Edwardsia sipunculoides			2	2				
Enteropneusta								
Eupentacta sp.								
Euphysa ruthae								
Golfingia pugettensis								
Havelochia benti								
Hippothoa hyalina			P					
Lineidae								
Metridium sp.								
Micrura sp.								1
Mogula pugetiensis								
Nemertina	1	3	4		1		2	2
Ophiura lutkeni								
Ophiurida	6		4	5	8	7	1	2
Paranemertes californica								
Paranemertes peregrina								
Pentamera pseudopopulifera								
Pentamera sp.								
Priapulus caudatus								
Pseudocnus sp.								
Ptilosarcus gurneyi								
Sipunculidae								
Stolidobranchia								
Strongylocentrotus droebachiensis								
Strongyocentrotus sp. juv								
Styela gibbsii		1						1
Stylochus exiguus								
Tubulanus frenatus				1				
Tubulanus nothus								
Tubulanus polymorphus	2		3					
Tubulanus sp.								
Tubulipora sp.								
Virgularia sp.								
NEMATODA	5	4	3	5	1	2	7	6
Abundance	15	8	16	15	10	12	10	13
Richness								

MISCELLANEOUS TAXA	HY7I-1	HY7I-2	HY7I-3	HY7I-6	HY8I-1	HY8I-4	HY8I-5	HY8I-7
Alcyonidium sp.			P					
Amphiodia sp.	1							
Amphipholis sp.								
Amphipholis squamata								
Amphiuridae	3					2		
Aplousobranchia								
Ascidiacea								
Athecata								
Barentsia sp.								
Bowerbankia sp.								
Callopora whiteavesi								
Campanulariidae								
Carinoma mutabilis								
Caulibugula sp.								
Cerebratulus sp.				1				
Crossaster papposus								
Cucumariidae			1					
Dendrobeania sp.								
Dendrochirotida								
Edwardsia sipunculoides		1						
Enteropneusta								
Eupentacta sp.								
Euphysa ruthae								
Golfingia pugettensis								
Havelochia benti								
Hippothoa hyalina								
Lineidae								
Metridium sp.								
Micrura sp.	1							
Mogula pugetiensis								
Nemertina					4	1		1
Ophiura lutkeni								
Ophiurida	3	3	4	7		1		
Paranemertes californica								
Paranemertes peregrina								
Pentamera pseudopopulifera								
Pentamera sp.								
Priapulus caudatus								
Pseudocnus sp.								
Ptilosarcus gurneyi								
Sipunculidae								
Stolidobranchia								
Strongylocentrotus droebachiensis								
Strongylocentrotus sp. juv								
Styela gibbsii								
Stylochus exiguus								
Tubulanus frenatus	1		1					
Tubulanus nothus								
Tubulanus polymorphus								
Tubulanus sp.								
Tubulipora sp.								
Virgularia sp.								
NEMATODA	1	1		2	1			15
Abundance	10	5	6	10	5	4	0	16
Richness								

MISCELLANEOUS TAXA	HY9I-1	HY9I-2	HY9I-3	HY9I-4	HY10I-3	HY10I-5	HY10I-6	HY10I-7
Alcyonidium sp.								
Amphiodia sp.								
Amphipholis sp.								
Amphipholis squamata								
Amphiuridae								
Aplousobranchia							1	
Ascidiacea								
Athecata								
Barentsia sp.								
Bowerbankia sp.								
Callopora whiteavesi								
Campanulariidae								
Carinoma mutabilis								
Caulibugula sp.								
Cerebratulus sp.								
Crossaster papposus								
Cucumariidae								
Dendrobeania sp.								
Dendrochirotida								
Edwardsia sipunculoides								
Enteropneusta								
Eupentacta sp.								
Euphysa ruthae								
Golfingia pugettensis								
Havelochia benti								
Hippothoa hyalina								
Lineidae								
Metridium sp.								
Micrura sp.								
Mogula pugetiensis								
Nemertina			1	2				
Ophiura lutkeni								
Ophiurida	17		5		6	12	1	3
Paranemertes californica								
Paranemertes peregrina								
Pentamera pseudopopulifera								
Pentamera sp.								
Priapulus caudatus								
Pseudocnus sp.								
Ptilosarcus gurneyi								
Sipunculidae								
Stolidobranchia								
Strongylocentrotus droebachiensis								
Strongyocentrotus sp. juv								
Styela gibbsii								
Stylochus exiguus								
Tubulanus frenatus					1			
Tubulanus nothus								
Tubulanus polymorphus					1			
Tubulanus sp.								
Tubulipora sp.								
Virgularia sp.								
NEMATODA	2				3	26	27	9
Abundance	19	0	6	2	11	38	29	12
Richness								

MISCELLANEOUS TAXA	HY11I-1	HY11I-3	HY11I-4	HY11I-7	HY12I-1	HY12I-4	HY12I-5	HY12I-6
Alcyonidium sp.								
Amphiodia sp.	3				2			
Amphipholis sp.								
Amphipholis squamata								
Amphiuridae	9	2	1	5		1	3	1
Aplousobranchia								
Asciidiacea								
Athecata							P	
Barentsia sp.								
Bowerbankia sp.								
Callopora whiteavesi								
Campanulariidae								
Carinoma mutabilis								
Caulibugula sp.								
Cerebratulus sp.								
Crossaster papposus								
Cucumariidae								
Dendrobeania sp.								
Dendrochirotida								
Edwardsia sipunculoides								
Enteropneusta								
Eupentacta sp.								
Euphysa ruthae								
Golfingia pugettensis							1	
Havelochia benti								
Hippothoa hyalina								
Lineidae								
Metridium sp.								
Micrura sp.					1			1
Mogula pugetiensis								
Nemertina					2		1	1
Ophiura lutkeni								
Ophiurida	1		1					
Paranemertes californica								
Paranemertes peregrina								
Pentamera pseudopopulifera								
Pentamera sp.								
Priapulus caudatus								
Pseudocnus sp.								
Ptilosarcus gurneyi			1					
Sipunculidae								
Stolidobranchia								
Strongylocentrotus droebachiensis								
Strongyocentrotus sp. juv								
Styela gibbsii								
Stylochus exiguus								
Tubulanus frenatus								
Tubulanus nothus								
Tubulanus polymorphus							2	1
Tubulanus sp.								
Tubulipora sp.								
Virgularia sp.			1					
NEMATODA		2	1	1				3
Abundance	13	4	5	6	5	1	7	7
Richness								

MISCELLANEOUS TAXA	HY13I-1	HY13I-2	HY13I-6	HY13I-7	HY14I-1	HY14I-2	HY14I-3	HY14I-7
Alcyonidium sp.								
Amphiodia sp.			1	2				
Amphipholis sp.			1					
Amphipholis squamata				1				
Amphiuridae								
Aplousobranchia								
Ascidiacea								
Athecata								
Barentsia sp.								
Bowerbankia sp.								
Callopora whiteavesi								
Campanulariidae								
Carinoma mutabilis								
Caulibugula sp.								
Cerebratulus sp.								
Crossaster papposus								
Cucumariidae								
Dendrobeania sp.								
Dendrochirotida								
Edwardsia sipunculoides								
Enteropneusta								
Eupentacta sp.								
Euphysa ruthae								
Golfingia pugettensis								
Havelochia benti								
Hippothoa hyalina				P				
Lineidae								
Metridium sp.								
Micrura sp.								
Mogula pugetiensis								
Nemertina			2			1		1
Ophiura lutkeni								
Ophiurida	2						1	
Paranemertes californica								
Paranemertes peregrina								
Pentamera pseudopopulifera								
Pentamera sp.								
Priapulus caudatus								
Pseudocnus sp.								
Ptilosarcus gurneyi								
Sipunculidae								
Stolidobranchia								
Strongylocentrotus droebachiensis								
Strongyocentrotus sp. juv								
Styela gibbsii								
Stylochus exiguus								
Tubulanus frenatus								
Tubulanus nothus								
Tubulanus polymorphus					1	2	1	
Tubulanus sp.								
Tubulipora sp.								
Virgularia sp.								
NEMATODA	3	1	3			1	1	7
Abundance	5	1	7	3	1	4	3	8
Richness								

MISCELLANEOUS TAXA	HY15I-1	HY15I-3	HY15I-4	HY15I-5	HY16I-2	HY16I-3	HY16I-4	HY16I-6
Alcyonidium sp.	P							
Amphiodia sp.				1				
Amphipholis sp.								
Amphipholis squamata								
Amphiuridae		2						
Aplousobranchia								
Ascidiacea								
Athecata								
Barentsia sp.								
Bowerbankia sp.								
Callopora whiteavesi								
Campanulariidae						P		
Carinoma mutabilis								
Caulibugula sp.								
Cerebratulus sp.								
Crossaster papposus								
Cucumariidae	1							
Dendrobeania sp.								
Dendrochirotida								
Edwardsia sipunculoides								
Enteropneusta								
Eupentacta sp.								
Euphysa ruthae								
Golfingia pugettensis								
Havelochia benti								
Hippothoa hyalina								
Lineidae								
Metridium sp.								
Micrura sp.		1		1			1	
Mogula pugetiensis								
Nemertina								
Ophiura lutkeni								
Ophiurida		1				3	3	2
Paranemertes californica								
Paranemertes peregrina								
Pentamera pseudopopulifera								
Pentamera sp.								
Priapulus caudatus								
Pseudocnus sp.								
Ptilosarcus gurneyi								
Sipunculidae								
Stolidobranchia								
Stronglylocentrotus droebachiensis								
Stronglyocentrotus sp. juv								
Styela gibbsii								
Stylochus exiguus								
Tubulanus frenatus								
Tubulanus nothus								
Tubulanus polymorphus						1		
Tubulanus sp.								
Tubulipora sp.								
Virgularia sp.								
NEMATODA	3	9	1	1		4	7	
Abundance	4	13	1	3	0	8	11	2
Richness								

MISCELLANEOUS TAXA	HY17I-1	HY17I-2	HY17I-5	HY17I-6	HY18I-1	HY18I-2	HY18I-4	HY18I-5
Alcyonidium sp.								
Amphiodia sp.								
Amphipholis sp.								
Amphipholis squamata								
Amphiuridae								
Aplousobranchia						1		
Ascidiacea								
Athecata								
Barentsia sp.								
Bowerbankia sp.								
Callopora whiteavesi								
Campanularlidae								
Carinoma mutabilis								
Caulibugula sp.								
Cerebratulus sp.								
Crossaster papposus								
Cucumarilidae								
Dendrobeania sp.								
Dendrochirotida								
Edwardsia sipunculoides							1	
Enteropneusta								
Eupentacta sp.								
Euphysa ruthae								
Golfingia pugettensis								
Havelochia benti								
Hippothoa hyalina								
Lineidae								
Metridium sp.								
Micrura sp.					1			
Mogula pugetiensis								
Nemertina					1			
Ophiura lutkeni								
Ophiurida		1	1			2	1	1
Paranemertes californica								
Paranemertes peregrina						2		
Pentamera pseudopopulifera								
Pentamera sp.								
Priapulus caudatus								
Pseudocnus sp.								
Ptilosarcus gurneyi								
Sipunculidae								
Stolidobranchia								
Stronglylocentrotus droebachiensis								
Stronglyocentrotus sp. juv								
Styela gibbsii								
Stylochus exiguus								
Tubulanus frenatus								
Tubulanus nothus								
Tubulanus polymorphus								
Tubulanus sp.								
Tubulipora sp.								
Virgularia sp.								
NEMATODA	3		1		11	2	1	7
Abundance	3	1	2	0	13	7	3	8
Richness								

MISCELLANEOUS TAXA	HY19I-2	HY19I-3	HY19I-4	HY19I-5	HY20I-1	HY20I-2	HY20I-4	HY20I-5
Alcyonidium sp.								
Amphiodia sp.								
Amphipholis sp.								
Amphipholis squamata								
Amphiuridae						2		
Aplousobranchia								
Ascidiacea								
Athecata								
Barentsia sp.								
Bowerbankia sp.								
Callopora whiteavesi								
Campanulariidae								
Carinoma mutabilis								
Caulibugula sp.								
Cerebratulus sp.								
Crossaster papposus								
Cucumariidae								
Dendrobeania sp.								
Dendrochirotida								
Edwardsia sipunculoides								
Enteropneusta								
Eupentacta sp.								
Euphysa ruthae								
Golfingia pugettensis								
Havelochia benti								
Hippothoa hyalina								
Lineidae								
Metridium sp.								
Micrura sp.								
Mogula pugetiensis								
Nemertina				1				1
Ophiura lutkeni								
Ophiurida	1			1		2		1
Paranemertes californica								
Paranemertes peregrina								
Pentamera pseudopopulifera								
Pentamera sp.								
Priapulus caudatus								
Pseudocnus sp.								
Ptilosarcus gurneyi								
Sipunculidae								
Stolidobranchia								
Stronglylocentrotus droebachiensis								
Strongiyocentrotus sp. juv								
Styela gibbsii								
Stylochus exiguus								
Tubulanus frenatus								
Tubulanus nothus								
Tubulanus polymorphus								
Tubulanus sp.								
Tubulipora sp.								
Virgularia sp.								
NEMATODA	4	44	23	22	1			
Abundance	5	44	23	24	1	4	0	2
Richness								

MISCELLANEOUS TAXA	HY21I-1	HY21I-2	HY21I-4	HY21I-6	HY22I-1	HY22I-3	HY22I-5	HY22I-7
Alcyonidium sp.								
Amphiodia sp.								
Amphipholis sp.								
Amphipholis squamata			1					
Amphiuridae			1					
Aplousobranchia								
Ascidiacea								
Athecata								
Barentsia sp.								
Bowerbankia sp.								
Callopora whiteavesi								
Campanulariidae								P
Carinoma mutabilis								
Caulibugula sp.								
Cerebratulus sp.								
Crossaster papposus								
Cucumariidae								
Dendrobeania sp.								
Dendrochirotida								
Edwardsia sipunculoides								
Enteropneusta								
Eupentacta sp.								
Euphysa ruthae								1
Golfingia pugettensis								
Havelochia benti								
Hippothoa hyalina								
Lineidae								
Metridium sp.								
Micrura sp.								1
Mogula pugetiensis								
Nemertina		1		1	1			
Ophiura lutkeni								
Ophiurida							1	4
Paranemertes californica								
Paranemertes peregrina								
Pentamera pseudopopulifera								
Pentamera sp.								
Priapulus caudatus								
Pseudocnus sp.								
Ptilosarcus gurneyi								
Sipunculidae								
Stolidobranchia								
Strongylocentrotus droebachiensis								
Strongylocentrotus sp. juv								
Styela gibbsii								
Stylochus exiguus								
Tubulanus frenatus								
Tubulanus nothus								
Tubulanus polymorphus								
Tubulanus sp.								
Tubulipora sp.								
Virgularia sp.								
NEMATODA	9	67	16	10	19	21	20	25
Abundance	9	68	18	11	20	21	21	31
Richness								

MISCELLANEOUS TAXA	HY23I-1	HY23I-2	HY23I-4	HY23I-7	HY24I-1	HY24I-2	HY24I-3	HY24I-4
Alcyonidium sp.								
Amphiodia sp.								
Amphipholis sp.								
Amphipholis squamata								
Amphiuridae				3				
Aplousobranchia								
Ascidiacea								
Athecata				P				
Barentsia sp.	P							
Bowerbankia sp.								
Callopora whiteavesi								
Campanulariidae								
Carinoma mutabilis								
Caulibugula sp.			P					
Cerebratulus sp.								
Crossaster papposus								
Cucumariidae								
Dendrobeania sp.								
Dendrochirotida								
Edwardsia sipunculoides								
Enteropneusta								
Eupentacta sp.								
Euphysa ruthae								
Golfingia pugettensis								
Havelochia benti								
Hippothoa hyalina								
Lineidae								
Metridium sp.								
Micrura sp.								
Mogula pugetiensis								
Nemertina								
Ophiura lutkeni								
Ophiurida				2				
Paranemertes californica								
Paranemertes peregrina								
Pentamera pseudopopulifera								
Pentamera sp.								
Priapulus caudatus								
Pseudocnus sp.								
Ptilosarcus gurneyi								
Sipunculidae								
Stolidobranchia								
Strongylocentrotus droebachiensis								
Strongyocentrotus sp. juv								
Styela gibbsii								
Stylochus exiguus	1							
Tubulanus frenatus								
Tubulanus nothus								
Tubulanus polymorphus								
Tubulanus sp.								
Tubulipora sp.								
Virgularia sp.								
NEMATODA	10	165	25	129	5	4		
Abundance	11	165	25	134	5	4	0	0
Richness								

MISCELLANEOUS TAXA	HY25I-4	HY25I-5	HY25I-6	HY25I-7	HY26I-3	HY26I-5	HY26I-6	HY26I-7
Alcyonidium sp.								
Amphiodia sp.								
Amphipholis sp.								
Amphipholis squamata								
Amphiuridae								
Aplousobranchia								
Ascidiacea								
Athecata								
Barentsia sp.								
Bowerbankia sp.								
Callopora whiteavesi								
Campanulariidae								
Carinoma mutabilis								
Caulibugula sp.								
Cerebratulus sp.								
Crossaster papposus								
Cucumariidae								
Dendrobeania sp.								
Dendrochirotida								
Edwardsia sipunculoides								
Enteropneusta								
Eupentacta sp.								
Euphysa ruthae								
Golfingia pugettensis								
Havelochia benti								
Hippothoa hyalina								
Lineidae								
Metridium sp.								
Micrura sp.								
Mogula pugetiensis								
Nemertina								
Ophiura lutkeni								
Ophiurida								
Paranemertes californica								
Paranemertes peregrina								
Pentamera pseudopopulifera								
Pentamera sp.								
Priapulus caudatus								
Pseudocnus sp.								
Ptilosarcus gurneyi								
Sipunculidae								
Stolidobranchia								
Stronglylocentrotus droebachiensis								
Stronglyocentrotus sp. juv								
Styela gibbsii								
Stylochus exiguus								
Tubulanus frenatus								
Tubulanus nothus								
Tubulanus polymorphus								
Tubulanus sp.								
Tubulipora sp.								
Virgularia sp.								
NEMATODA	2		1					
Abundance	2	0	1	0	0	0	0	0
Richness								

MISCELLANEOUS TAXA	HY27I-2	HY27I-3	HY27I-6	HY27I-7	HY28I-3	HY28I-5	HY28I-6	HY28I-7
Alcyonidium sp.								
Amphiodia sp.								
Amphipholis sp.								
Amphipholis squamata								
Amphiuridae								
Aplousobranchia								
Ascidiacea								
Athecata								
Barentsia sp.								
Bowerbankia sp.								
Callopora whiteavesi								
Campanulariidae								
Carinoma mutabilis								
Caulibugula sp.								
Cerebratulus sp.								
Crossaster papposus								
Cucumariidae								
Dendrobeania sp.								
Dendrochirotida								
Edwardsia sipunculoides								
Enteropneusta								
Eupentacta sp.								
Euphysa ruthae								
Golfingia pugettensis								
Havelochia benti								
Hippothoa hyalina								
Lineidae								
Metridium sp.								
Micrura sp.								
Mogula pugetiensis								
Nemertina				1		2		
Ophiura lutkeni								
Ophiurida								
Paranemertes californica								
Paranemertes peregrina								
Pentamera pseudopopulifera								
Pentamera sp.								
Priapulus caudatus								
Pseudocnus sp.								
Ptilosarcus gurneyi								
Sipunculidae								
Stolidobranchia								
Stronglylocentrotus droebachiensis								
Strongiyocentrotus sp. juv								
Styela gibbsii								
Stylochus exiguus								
Tubulanus frenatus								
Tubulanus nothus								
Tubulanus polymorphus								
Tubulanus sp.								
Tubulipora sp.								
Virgularia sp.								
NEMATODA		1			1			2
Abundance	0	1	0	1	1	2	0	2
Richness								

MISCELLANEOUS TAXA	HY30I-1	HY30I-2	HY30I-5	HY30I-6	HY35I-1	HY35I-4	HY35I-5	HY35I-7
Alcyonidium sp.						P		P
Amphiodia sp.			1	1	8	1	4	2
Amphipholis sp.						4		
Amphipholis squamata		3	1		6	3	3	5
Amphiuridae			2	2	2	1	6	3
Aplousobranchia								
Ascidiacea								
Athecata								
Barentsia sp.		P						
Bowerbankia sp.								
Callopora whiteavesi						P		
Campanulariidae								P
Carinoma mutabilis						1		
Caulibugula sp.								
Cerebratulus sp.		3	3				2	
Crossaster papposus						1		
Cucumariidae								
Dendrobeania sp.		P						
Dendrochirotida					1	38	35	95
Edwardsia sipunculoides						2	3	1
Enteropneusta								
Eupentacta sp.						1		
Euphysa ruthae								
Golfingia pugettensis				1		4	2	2
Havelochia benti						1		
Hippothoa hyalina						P	P	
Lineidae								
Metridium sp.								
Micrura sp.			1		6	5	1	3
Mogula pugetiensis			1			4		
Nemertina	5	5	9	3	14			2
Ophiura lutkeni								
Ophiurida	3	4	1	1	5			
Paranemertes californica		2					1	1
Paranemertes peregrina		1		1				
Pentamera pseudopopulifera								1
Pentamera sp.				2	3			1
Priapulus caudatus								1
Pseudocnus sp.								1
Ptilosarcus gurneyi								
Sipunculidae								
Stolidobranchia		1						
Stronglylocentrotus droebachiensis								1
Stronglyocentrotus sp. juv								1
Styela gibbsii					4			
Stylochus exiguus								
Tubulanus frenatus								
Tubulanus nothus						2	3	1
Tubulanus polymorphus		4		1	5	5	6	7
Tubulanus sp.								
Tubulipora sp.						P		
Virgularia sp.								
NEMATODA	4	4	7		9	7	4	30
Abundance	12	27	26	12	63	80	70	158
Richness								

MISCELLANEOUS TAXA	CR2I-1	CR2I-4	CR2I-5	CR2I-7	CR2AI-1	CR2AI-2	CR2AI-3	CR2AI-4
Alcyonidium sp.		P		P				
Amphiodia sp.	24	26	71	34	166	206	224	264
Amphipholis sp.								
Amphipholis squamata								
Amphiuridae							1	
Aplousobranchia								
Ascidiacea								
Athecata		P						
Barentsia sp.								
Bowerbankia sp.								
Callopora whiteavesi								
Campanulariidae				P				
Carinoma mutabilis								
Caulibugula sp.								
Cerebratulus sp.	1	5		1				1
Crossaster papposus								
Cucumariidae								
Dendrobeania sp.								
Dendrochirotida								
Edwardsia sipunculoides	2	3	1					
Enteropneusta		2	4					
Eupentacta sp.								
Euphysa ruthae								
Golfingia pugettensis	1	1		2				
Havelochia benti								
Hippothoa hyalina								
Lineidae	8	4		12				
Metridium sp.		1						
Micrura sp.			2	1	1	8		10
Mogula pugetiensis								
Nemertina	5	18	20		14		8	1
Ophiura lutkeni								
Ophiurida	1							
Paranemertes californica								
Paranemertes peregrina								
Pentamera pseudopopulifera								
Pentamera sp.								
Priapulus caudatus								
Pseudocnus sp.								
Ptilosarcus gurneyi								
Sipunculidae		1						
Stolidobranchia								
Strongylocentrotus droebachiensis								
Strongyocentrotus sp. juv								
Styela gibbsii								
Stylochus exiguus								
Tubulanus frenatus								
Tubulanus nothus				1				
Tubulanus polymorphus	3			3		3		5
Tubulanus sp.								
Tubulipora sp.								
Virgularia sp.								
NEMATODA	3	7	4	23				
Abundance	48	68	102	77	181	217	233	281
Richness								

MISCELLANEOUS TAXA	Total HY1I	Total HY2I	Total HY3I	Total HY4I	Total HY5I	Total HY6I
Alcyonidium sp.	1	1	0	0	0	1
Amphiodia sp.	34	14	2	2	1	0
Amphipholis sp.	0	0	0	0	0	0
Amphipholis squamata	0	4	1	0	2	0
Amphiuridae	23	4	0	0	0	2
Aplousobranchia	0	0	0	0	0	0
Ascidiacea	1	0	0	0	0	0
Athecata	0	0	0	0	0	0
Barentsia sp.	1	0	0	0	0	0
Bowerbankia sp.	0	1	0	0	0	0
Callopora whiteavesi	0	0	0	0	0	0
Campanulariidae	1	1	1	1	0	1
Carinoma mutabilis	0	0	0	0	0	0
Caulibugula sp.	1	0	0	1	0	0
Cerebratulus sp.	0	1	0	0	0	0
Crossaster papposus	0	0	0	0	0	0
Cucumariidae	0	0	0	0	0	0
Dendrobeania sp.	0	0	0	0	0	0
Dendrochirotida	0	0	0	0	0	2
Edwardsia sipunculoides	5	0	2	5	4	0
Enteropneusta	0	0	0	0	0	0
Eupentacta sp.	1	2	2	2	0	0
Euphysa ruthae	0	0	0	0	0	0
Golfingia pugettensis	0	2	0	0	0	0
Havelochia benti	0	0	0	0	0	0
Hippothoa hyalina	0	0	0	0	1	0
Lineidae	0	0	0	0	0	0
Metridium sp.	0	0	0	0	0	0
Micrura sp.	2	3	1	0	0	1
Mogula pugetiensis	0	0	0	0	0	0
Nemertina	1	7	13	1	8	5
Ophiura lutkeni	0	1	0	0	0	0
Ophiurida	7	1	20	3	15	18
Paranemertes californica	1	0	0	0	0	0
Paranemertes peregrina	0	0	0	0	0	0
Pentamera pseudopopulifera	0	0	0	0	0	0
Pentamera sp.	0	0	0	0	0	0
Priapulus caudatus	0	0	0	0	0	0
Pseudocnus sp.	0	0	0	0	0	0
Ptilosarcus gurneyi	0	0	0	0	0	0
Sipunculidae	0	0	0	0	0	0
Stolidobranchia	1	0	0	0	0	0
Stronglylocentrotus droebachiensis	0	0	0	0	0	0
Stronglyocentrotus sp. juv	0	0	0	0	0	0
Styela gibbsii	0	0	0	0	1	1
Stylochus exiguus	0	0	0	0	0	0
Tubulanus frenatus	1	1	0	0	1	0
Tubulanus nothus	0	0	0	0	0	0
Tubulanus polymorphus	14	5	2	0	5	0
Tubulanus sp.	2	0	0	0	0	0
Tubulipora sp.	0	0	0	0	0	0
Virgularia sp.	0	0	0	0	0	0
NEMATODA	23	26	25	15	17	16
Abundance						
Richness	18	16	10	8	10	9

MISCELLANEOUS TAXA	Total HY7I	Total HY8I	Total HY9I	Total HY10I	Total HY11I	Total HY12I
Alcyonidium sp.	1	0	0	0	0	0
Amphiodia sp.	1	0	0	0	3	2
Amphipholis sp.	0	0	0	0	0	0
Amphipholis squamata	0	0	0	0	0	0
Amphiuridae	3	2	0	1	17	5
Aplousobranchia	0	0	0	0	0	0
Ascidiacea	0	0	0	0	0	0
Athecata	0	0	0	0	0	1
Barentsia sp.	0	0	0	0	0	0
Bowerbankia sp.	0	0	0	0	0	0
Callopora whiteavesi	0	0	0	0	0	0
Campanulariidae	0	0	0	0	0	0
Carinoma mutabilis	0	0	0	0	0	0
Caulibugula sp.	0	0	0	0	0	0
Cerebratulus sp.	1	0	0	0	0	0
Crossaster papposus	0	0	0	0	0	0
Cucumariidae	1	0	0	0	0	0
Dendrobeania sp.	0	0	0	0	0	0
Dendrochirotida	0	0	0	0	0	0
Edwardsia sipunculoides	1	0	0	0	0	0
Enteropneusta	0	0	0	0	0	0
Eupentacta sp.	0	0	0	0	0	0
Euphysa ruthae	0	0	0	0	0	0
Gottingia pugettensis	0	0	0	0	0	1
Havelochia benti	0	0	0	0	0	0
Hippothoa hyalina	0	0	0	0	0	0
Lineidae	0	0	0	0	0	0
Metridium sp.	0	0	0	0	0	0
Micrura sp.	1	0	0	0	0	2
Mogula pugetiensis	0	0	0	0	0	0
Nemertina	0	6	3	0	0	4
Ophiura lutkeni	0	0	0	0	0	0
Ophiurida	17	1	22	22	2	0
Paranemertes californica	0	0	0	0	0	0
Paranemertes peregrina	0	0	0	0	0	0
Pentamera pseudopopulifera	0	0	0	0	0	0
Pentamera sp.	0	0	0	0	0	0
Priapulus caudatus	0	0	0	0	0	0
Pseudocnus sp.	0	0	0	0	0	0
Ptilosarcus gurneyi	0	0	0	0	1	0
Sipunculidae	0	0	0	0	0	0
Stolidobranchia	0	0	0	0	0	0
Strongylocentrotus droebachiensis	0	0	0	0	0	0
Strongyocentrotus sp. juv	0	0	0	0	0	0
Styela gibbsii	0	0	0	0	0	0
Stylochus exiguus	0	0	0	0	0	0
Tubulanus frenatus	2	0	0	1	0	0
Tubulanus nothus	0	0	0	0	0	0
Tubulanus polymorphus	0	0	0	1	0	3
Tubulanus sp.	0	0	0	0	0	0
Tubulipora sp.	0	0	0	0	0	0
Virgularia sp.	0	0	0	0	1	0
NEMATODA	4	16	2	65	4	3
Abundance						
Richness	10	4	3	5	6	8

MISCELLANEOUS TAXA	Total HY13I	Total HY14I	Total HY15I	Total HY16I	Total HY17I	Total HY18I
Alcyonidium sp.	0	0	1	0	0	0
Amphiodia sp.	3	0	1	0	0	0
Amphipholis sp.	1	0	0	0	0	0
Amphipholis squamata	1	0	0	0	0	0
Amphiuridae	0	0	2	0	0	0
Aplousobranchia	0	0	0	0	0	1
Ascidiacea	0	0	0	0	0	0
Athecata	0	0	0	0	0	0
Barentsia sp.	0	0	0	0	0	0
Bowerbankia sp.	0	0	0	0	0	0
Callopora whiteavesi	0	0	0	0	0	0
Campanulariidae	0	0	0	1	0	0
Carinoma mutabilis	0	0	0	0	0	0
Caulibugula sp.	0	0	0	0	0	0
Cerebratulus sp.	0	0	0	0	0	0
Crossaster papposus	0	0	0	0	0	0
Cucumariidae	0	0	1	0	0	0
Dendrobeania sp.	0	0	0	0	0	0
Dendrochirotida	0	0	0	0	0	0
Edwardsia sipunculoides	0	0	0	0	0	1
Enteropneusta	0	0	0	0	0	0
Eupentacta sp.	0	0	0	0	0	0
Euphysa ruthae	0	0	0	0	0	0
Goffingia pugettensis	0	0	0	0	0	0
Havelochia benti	0	0	0	0	0	0
Hippothoa hyalina	1	0	0	0	0	0
Lineidae	0	0	0	0	0	0
Metridium sp.	0	0	0	0	0	0
Micrura sp.	0	0	2	1	0	1
Mogula pugetiensis	0	0	0	0	0	0
Nemertina	2	2	0	0	0	1
Ophiura lutkeni	0	0	0	0	0	0
Ophiurida	2	1	1	8	2	4
Paranemertes californica	0	0	0	0	0	0
Paranemertes peregrina	0	0	0	0	0	2
Pentamera pseudopopulifera	0	0	0	0	0	0
Pentamera sp.	0	0	0	0	0	0
Priapulus caudatus	0	0	0	0	0	0
Pseudocnus sp.	0	0	0	0	0	0
Ptilosarcus gurneyi	0	0	0	0	0	0
Sipunculidae	0	0	0	0	0	0
Stolidobranchia	0	0	0	0	0	0
Strongylocentrotus droebachiensis	0	0	0	0	0	0
Strongyocentrotus sp. juv	0	0	0	0	0	0
Styela gibbsii	0	0	0	0	0	0
Stylochus exiguus	0	0	0	0	0	0
Tubulanus frenatus	0	0	0	0	0	0
Tubulanus nothus	0	0	0	0	0	0
Tubulanus polymorphus	0	4	0	1	0	0
Tubulanus sp.	0	0	0	0	0	0
Tubulipora sp.	0	0	0	0	0	0
Virgularia sp.	0	0	0	0	0	0
NEMATODA	7	9	14	11	4	21
Abundance						
Richness	7	4	7	5	2	7

MISCELLANEOUS TAXA	Total HY19I	Total HY20I	Total HY21I	Total HY22I	Total HY23I	Total HY24I
Alcyonidium sp.	0	0	0	0	0	0
Amphiodia sp.	0	0	0	0	0	0
Amphipholis sp.	0	0	0	0	0	0
Amphipholis squamata	0	0	1	0	0	0
Amphiuridae	0	2	1	0	3	0
Aplousobranchia	0	0	0	0	0	0
Ascidiacea	0	0	0	0	0	0
Athecata	0	0	0	0	1	0
Barentsia sp.	0	0	0	0	1	0
Bowerbankia sp.	0	0	0	0	0	0
Callopora whiteavesi	0	0	0	0	0	0
Campanulariidae	0	0	0	1	0	0
Carinoma mutabilis	0	0	0	0	0	0
Caulibugula sp.	0	0	0	0	1	0
Cerebratulus sp.	0	0	0	0	0	0
Crossaster papposus	0	0	0	0	0	0
Cucumariidae	0	0	0	0	0	0
Dendrobeania sp.	0	0	0	0	0	0
Dendrochirotida	0	0	0	0	0	0
Edwardsia sipunculoides	0	0	0	0	0	0
Enteropneusta	0	0	0	0	0	0
Eupentacta sp.	0	0	0	0	0	0
Euphysa ruthae	0	0	0	1	0	0
Golfingia pugettensis	0	0	0	0	0	0
Havelochia benti	0	0	0	0	0	0
Hippothoa hyalina	0	0	0	0	0	0
Lineidae	0	0	0	0	0	0
Metridium sp.	0	0	0	0	0	0
Micrura sp.	0	0	0	1	0	0
Mogula pugetiensis	0	0	0	0	0	0
Nemertina	1	1	2	1	0	0
Ophiura lutkeni	0	0	0	0	0	0
Ophiurida	2	3	0	5	2	0
Paranemertes californica	0	0	0	0	0	0
Paranemertes peregrina	0	0	0	0	0	0
Pentamera pseudopopulifera	0	0	0	0	0	0
Pentamera sp.	0	0	0	0	0	0
Priapulus caudatus	0	0	0	0	0	0
Pseudocnus sp.	0	0	0	0	0	0
Ptilosarcus gurneyi	0	0	0	0	0	0
Sipunculidae	0	0	0	0	0	0
Stolidobranchia	0	0	0	0	0	0
Strongylocentrotus droebachiensis	0	0	0	0	0	0
Strongylocentrotus sp. juv	0	0	0	0	0	0
Styela gibbsii	0	0	0	0	0	0
Stylochus exiguus	0	0	0	0	1	0
Tubulanus frenatus	0	0	0	0	0	0
Tubulanus nothus	0	0	0	0	0	0
Tubulanus polymorphus	0	0	0	0	0	0
Tubulanus sp.	0	0	0	0	0	0
Tubulipora sp.	0	0	0	0	0	0
Virgularia sp.	0	0	0	0	0	0
NEMATODA	93	1	102	85	329	9
Abundance						
Richness	3	4	4	6	7	1

MISCELLANEOUS TAXA	Total HY25I	Total HY26I	Total HY27I	Total HY28I	Total HY30I	Total HY35I
Alcyonidium sp.	0	0	0	0	0	1
Amphiodia sp.	0	0	0	0	2	15
Amphipholis sp.	0	0	0	0	0	4
Amphipholis squamata	0	0	0	0	4	17
Amphiuridae	0	0	0	0	4	12
Aplousobranchia	0	0	0	0	0	0
Ascidiacea	0	0	0	0	0	0
Athecata	0	0	0	0	0	0
Barentsia sp.	0	0	0	0	1	0
Bowerbankia sp.	0	0	0	0	0	0
Callopora whiteavesi	0	0	0	0	0	1
Campanulariidae	0	0	0	0	0	1
Carinoma mutabilis	0	0	0	0	0	1
Caulibugula sp.	0	0	0	0	0	0
Cerebratulus sp.	0	0	0	0	6	2
Crossaster papposus	0	0	0	0	0	1
Cucumariidae	0	0	0	0	0	0
Dendrobeania sp.	0	0	0	0	1	0
Dendrochirotida	0	0	0	0	0	169
Edwardsia sipunculoides	0	0	0	0	0	6
Enteropneusta	0	0	0	0	0	0
Eupentacta sp.	0	0	0	0	0	1
Euphysa ruthae	0	0	0	0	0	0
Golfingia pugettensis	0	0	0	0	1	8
Havelochia benti	0	0	0	0	0	1
Hippothoa hyalina	0	0	0	0	0	1
Lineidae	0	0	0	0	0	0
Metridium sp.	0	0	0	0	0	0
Micrura sp.	0	0	0	0	1	15
Mogula pugetiensis	0	0	0	0	1	4
Nemertina	0	0	1	2	22	16
Ophiura lutkeni	0	0	0	0	0	0
Ophiurida	0	0	0	0	9	5
Paranemertes californica	0	0	0	0	2	2
Paranemertes peregrina	0	0	0	0	2	0
Pentamera pseudopopulifera	0	0	0	0	0	1
Pentamera sp.	0	0	0	0	2	4
Priapulus caudatus	0	0	0	0	0	1
Pseudocnus sp.	0	0	0	0	0	1
Ptilosarcus gurneyi	0	0	0	0	0	0
Sipunculidae	0	0	0	0	0	0
Stolidobranchia	0	0	0	0	1	0
Stronglylocentrotus droebachiensis	0	0	0	0	0	1
Stronglyocentrotus sp. juv	0	0	0	0	0	1
Styela gibbsii	0	0	0	0	0	4
Stylochus exiguus	0	0	0	0	0	0
Tubulanus frenatus	0	0	0	0	0	0
Tubulanus nothus	0	0	0	0	0	6
Tubulanus polymorphus	0	0	0	0	5	23
Tubulanus sp.	0	0	0	0	0	0
Tubulipora sp.	0	0	0	0	0	1
Virgularia sp.	0	0	0	0	0	0
NEMATODA	3	0	1	3	15	50
Abundance						
Richness	1	0	2	2	17	32

MISCELLANEOUS TAXA	Total CR2I	TotalCR2AI	Total
Alcyonidium sp.	1	0	7
Amphiodia sp.	155	860	1095
Amphipholis sp.	0	0	5
Amphipholis squamata	0	0	30
Amphiuridae	0	1	82
Aplousobranchia	0	0	1
Ascidiacea	0	0	1
Athecata	1	0	3
Barentsia sp.	0	0	3
Bowerbankia sp.	0	0	1
Callopora whiteavesi	0	0	1
Campanulariidae	1	0	9
Carinoma mutabilis	0	0	1
Caulibugula sp.	0	0	3
Cerebratulus sp.	7	1	18
Crossaster papposus	0	0	1
Cucumariidae	0	0	2
Dendrobeania sp.	0	0	1
Dendrochirotida	0	0	171
Edwardsia sipunculoides	6	0	30
Enteropneusta	6	0	6
Eupentacta sp.	0	0	8
Euphysa ruthae	0	0	1
Golfingia pugettensis	4	0	16
Havelochia benti	0	0	1
Hippothoa hyalina	0	0	3
Lineidae	24	0	24
Metridium sp.	1	0	1
Micrura sp.	3	19	53
Mogula pugetiensis	0	0	5
Nemertina	43	23	165
Ophiura lutkeni	0	0	1
Ophiurida	1	0	173
Paranemertes californica	0	0	5
Paranemertes peregrina	0	0	4
Pentamera pseudopopulifera	0	0	1
Pentamera sp.	0	0	6
Priapulus caudatus	0	0	1
Pseudocnus sp.	0	0	1
Ptilosarcus gurneyi	0	0	1
Sipunculidae	1	0	1
Stolidobranchia	0	0	2
Strongylocentrotus droebachiensis	0	0	1
Strongyocentrotus sp. juv	0	0	1
Styela gibbsii	0	0	6
Stylochus exiguus	0	0	1
Tubulanus frenatus	0	0	6
Tubulanus nothus	1	0	7
Tubulanus polymorphus	6	8	77
Tubulanus sp.	0	0	2
Tubulipora sp.	0	0	1
Virgularia sp.	0	0	1
NEMATODA	37	0	1010
Abundance			
Richness	17	6	53

APPENDIX E

BENTHIC ENUMERATION DATA

COMMENCEMENT BAY DAMAGE ASSESSMENT STUDIES:

Hylebos Waterway Sediment Toxicity Study Test results

Prepared for: Damage Assessment and Restoration Center
National Oceanic and Atmospheric Administration
7600 Sand Point Way N.E.
Seattle, WA 98115

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EVS Project No: 2/618-02.1

April 1995

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1.0 INTRODUCTION

Sediment toxicity tests using the amphipod, *Rhepoxynius abronius*, the polycheate; *Neanthes* spp.; and larvae of the echinoderm, *Dendraster excentricus*, were conducted based on methods described in the combined Quality Assurance Project Plan and Laboratory Analysis Plan (QAPP/LAP) (EVS, 1994). Thirty sediment samples were collected between May 23 and June 1, 1994. Samples were identified as follows:

DAC-HY-1T	DAC-HY-11T	DAC-HY-21T
DAC-HY-2T	DAC-HY-12T	DAC-HY-22T
DAC-HY-3T	DAC-HY-13T	DAC-HY-23T
DAC-HY-4T	DAC-HY-14T	DAC-HY-24T
DAC-HY-5T	DAC-HY-15T	DAC-HY-25T
DAC-HY-6T	DAC-HY-16T	DAC-HY-26T
DAC-HY-7T	DAC-HY-17T	DAC-HY-27T
DAC-HY-8T	DAC-HY-18T	DAC-HY-28T
DAC-HY-9T	DAC-HY-19T	DAC-CR-2T
DAC-HY-10T	DAC-HY-20T	DAC-CR-2AT

The sediments were transported to the laboratory on May 28 and June 2, 1994 and stored at 4°C in the dark until testing was initiated. Due to the large number of samples, the sediments were divided into two batches. The amphipod and *Neanthes* bioassays were initiated on May 31 and June 3, 1994 and the larval bioassay was initiated on June 8, and June 9, 1994.

2.0 METHODS

This section provides a brief description of the test methods. Detailed laboratory SOPs for each test were are included in the combined QAPP/LAP (EVS 1994).

2.1 Amphipod Bioassay (*Rhepoxynius abronius*)

Adult amphipods were collected from West Beach, Whidbey Island, Washington, and acclimated

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to the test water temperature and salinity for four days prior to testing. For each bioassay replicate, 20 amphipods were exposed to a 2-cm layer of sediment (test and reference) in a 1-liter chamber filled with clean seawater (800 ml). Each chamber was examined on a daily basis for dead amphipods, amphipods emerged from the sediment (either floating on water surface or lying on tope of the sediment), and abnormal behavioral responses (e.g., failure to rebury). All observations were recorded in the laboratory notebook. Five replicate analyses were conducted for each test sample. After the 10-day exposure period, the amphipods in each test chamber were sieved from the sediment and the survivors counted. Percent mortality was determined relative to the total of 20 individuals added to each chamber at the beginning of the test. The ability of survivors to rebury was determined by exposing them to clean control sediment and recording the number that failed to rebury after a 1-hour period. Percent non-reburial was determined relative to the number of survivors in each test chamber. Effective mortality was determined from the sum of dead individuals plus those survivors that were not able to rebury.

QA/QC procedures for the amphipod bioassay include the use of a reference sediment, positive and negative controls, and daily measurement of water quality conditions (i.e., temperature, salinity, pH, dissolved oxygen) in each test chamber. A performance standard of no more than 10 percent mortality in the control replicates was to assess test acceptability. If the control standard is exceed (i.e., mortality greater than 10 percent for the controls) then the data will either be rejected, or, based on evaluation of other performance measures (e.g., positive control and reference sediment survival rates), the data may be qualified and accepted for analysis. In the present study, cadmium chloride was used as the reference toxicant and a sediment from West Beach, Whidbey Island, Washington was used as the negative control.

2.2 Juvenile Polychaete Bioassay

Neanthes spp. were obtained from laboratory cultures. Upon receipt of test animals, they were acclimated to test water temperature and salinity for a period of 2 days. Animals were fed (TetraMin®) during the acclimation period and weight 0.5 to 1.0 mg (dry weight) at the start of the test. The bioassays were conducted using a static-renewal system. Five replicates were prepared for each sample. Each exposure chamber consisted of a 1-liter jar, 2-cm of sediment, and 800-ml of clean seawater. Five juvenile worms were randomly added to each exposure chamber. All chambers were examined one hour after addition of test animals. All animals that did not appear to be burrowing were replaced. Approximately 40 mg of TetraMin® was added to each chamber every second day. Every third day, one-third of the overlying water in each chamber was exchanged with fresh seawater to prevent water quality deterioration. At the beginning of the test, three subsamples of worms (five worms per subsample) were randomly selected to provide an estimate of initial worm biomass. Dry weights (nearest 0.1 mg) were obtained after drying these worms for 24 hours at 50°C. After the 20-day exposure period, the contents of each replicate chamber was sieved (0.5 mm) and the number of survivors recorded. Percent mortality was determined relative to the total of five individuals added to each chamber

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at the start of the test. Final worm weight for each replicate was determined by drying all survivors at 50°C for 24 hours and weighing to the nearest 0.1 mg.

QA/QC procedures for the juvenile polychaete bioassay include the use of a reference sediment, positive and negative controls, and daily measurement of water quality conditions (i.e., temperature, salinity, pH, dissolved oxygen) in each test chamber. Water quality measurements were made just prior to seawater placement. A performance standard of no more than 10 percent mortality in the control replicates was used to assess test acceptability. If the control standard is exceed (i.e., mortality greater than 10 percent for the controls) then the data will either be rejected, or, based on evaluation of other performance measures (e.g., positive control and reference sediment survival rates), the data may be qualified and accepted for analysis. In the present study, cadmium chloride was used as the reference toxicant and a sediment from West Beach, Whidbey Island, Washington, was used as the negative control. No performance criteria have been established for the growth endpoint for this test.

2.3 Echinoderm Larvae Bioassay

Stocks of mature, adult echinoderms were obtained from the EVS marine laboratory. Adult sand dollars were spawned in the laboratory by injecting 0.5M KCl into the coelomic cavity. Prior to spawning of the adults, five replicate test beakers were prepared for each sample. Twenty grams (20 g) of sediment were added to each beaker; clean seawater was added up to 1 liter to make a final concentration in all containers of 20 grams (wet weight) of sediment per liter of seawater. Sediments were suspended by vigorous shaking for 10 seconds then allowed to settle for four hours prior to adding the embryos. For each bioassay replicate, approximately 20,000 to 40,000 embryos were added to a 1-liter test chamber within 2 hours of fertilization. The embryo concentration at test initiation (T_0 hours) was confirmed by collecting replicate 10 ml samples from control cultures and preserving them in 5-percent buffered formalin. After a 48-hour incubation period, the water and larvae overlying the settled sediment in each beaker was decanted into a clean 1-liter beaker and the water mixed thoroughly. A 10-ml aliquot was removed from each sample and placed into a vial. The contents of vial were preserved in 5-percent buffered formalin. Preserved samples were examined for normal and abnormal larval development. Abnormal development is defined as failure to develop the fully shelled, hinged, D-shaped prodissoconch I stage. Percent survival for each replicate bioassay was based on the number of larvae surviving in each test container relative to the initial number; percent abnormal development for each replicate was based on the number of survivors that are abnormal.

QA/QC procedures for the echinoderm larval bioassay include the use of a reference sediment, positive and negative controls, and measurement of water quality conditions (i.e., temperature, salinity, pH, dissolved oxygen). Water quality measurements were made daily in the replicates prepared specifically for monitoring water quality. Ammonia-nitrogen was measured in a subsample of water from the water quality control beaker for each sediment sample and from the

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seawater control at the beginning and end of the exposure period. The test was considered valid if more than 30 percent of the negative control organisms die and control abnormalities exceed 10 percent. In the present study, both cadmium chloride and sodium dodecyl sulphate were used as the reference toxicants; sediment from West Beach, Whidbey Island, Washington, was used as the negative control.

3.0 RESULTS

This section presents a summary of the test results and the water quality parameters. In addition, any deviations from the test protocol are noted and the corrective action taken noted.

3.1 Amphipod Bioassay (*Rhepoxynius abronius*)

Results of the sediment toxicity tests are summarized in Tables 1 and 2. Raw data and statistical printouts are provided in Appendix A. Mean Survival in the two control sediments for Setup #1 were both 97%. Mean survival in the two control sediments for Setup #2 was 96% and 93 %. All these results met the specified control criteria. Survival in the Hylebos Waterway test sediments ranged from 67-97% in Setup #1 and in Setup #2 from 56-93.8 %. Percent reburial ranged from 84-96% in Setup #1 and in Setup #2 from 85-100%.

Replicate C for Control Sample 2, Setup #1 was misseeded with 1 extra amphipod. Therefore, calculations for Control Sample 2 was based on 101 total amphipods. Replicates C,D, and E for sample DAC-HY-19T were misseeded with 40 amphipods each. Therefore, calculations for sample DAC-HY-19T were based on 160 total amphipods. Replicate B for sample DAC-HY-23T and replicate D for sample DAC-HY-2AT were each misseeded with 40 amphipods. Therefore, calculations for sample DAC-HY-23T and DAC-HY-2AT were based on 120 total amphipods. Replicate C for sample DAC-HY-7T was tipped over on Day 5 of testing and was therefore removed from statistical analysis.

Water quality parameters for both setups were in the following ranges:

temperature	15-16 °C;
dissolved oxygen	7.0-8.9 mg/L;
pH	7.5-8.4;
salinity	27-31 ppt.

The 96-h LC50 value (the concentration at which 50% mortality occurred) for the reference toxicant was determined using the EFFL software program (Stephan, 1977). The 96-h LC50 value for cadmium was 1.113 mg/L for Setup #1 and 1.056 mg/L for Setup #2. The approximate 95% confidence limits were calculated using the binomial test and were determined to be 0.320 and 1.800 mg/L for both setups.

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Table 1. Summary of *Rhepoxynius abronius* (Setup #1) sediment toxicity test results.

Sample ID	Mean Survival (%)	Mean Reburial (%)
Control 1	97	100
DAC-HY-13T	89	96
DAC-HY-14T	97	84
DAC-HY-15T	86	94
DAC-HY-16T	88	92
DAC-HY-18T	86	95
DAC-HY-19T	91	92
DAC-HY-21T	73	85
DAC-HY-22T	85	91
DAC-HY-24T	67	94
Control 2	97	100
DAC-HY-17T	84	89
DAC-HY-20T	84	96
DAC-HY-23T	84	86

Table 2. Summary of *Rhepoxynius abronius* (Setup #2) sediment toxicity test results.

Sample ID	Mean Survival (%)	Mean Reburial (%)
Control 1	96	99
DAC-HY-4T	79	97
DAC-HY-6T	87	95
DAC-HY-7T	93.8	92
DAC-HY-9T	84	94
DAC-HY-10T	56	98
DAC-HY-12T	77	97
DAC-HY-26T	81	85
DAC-HY-27T	86	88
DAC-HY-28T	72	92
Control 2	93	98
DAC-HY-1T	77	96
DAC-HY-2T	88	91
DAC-HY-3T	86	97
DAC-HY-5T	77	97
DAC-HY-8T	74	96
DAC-HY-11T	86	100
DAC-HY-25T	87	97
DAC-CR-2T	85	100
DAC-CR-2AT	72	96

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3.2 Juvenile Polychaete Bioassay

Results of the sediment toxicity tests are summarized in Tables 3 and 4. Raw data and statistical printouts are provided in Appendix B. Mean Survival in the two control sediments for Setup #1 were both 100%. Mean survival in the two control sediments for Setup #2 were also both 100%. All these results met the specified control criteria. Survival in the Hylebos Waterway test sediments ranged from 88-100% in Setup #1 and in Setup #2 from 92-100%. Mean individual biomass ranged from 9.40-14.18 mg in Setup #1 and in Setup #2 from 6.15-12.58 mg.

Replicate A for sample DAC-HY-21T was misseeded with 6 organisms. Replicate B for sample DAC-HY-27T was double seeded with 10 organisms. Replicate C for sample DAC-HY-27T was missed in the seeding process. All calculations for this sample (DAC-HY-27T) are based on four replicates. The following replicates were missing small pieces of one or more organisms: DAC-HY-9T-A; DAC-HY-28T-D; DAC-HY-1T-B,D; DAC-HY-8T-A; DAC-HY-5T-C; DAC-HY-25T-A,C; DAC-HY-21T-E; and DAC-HY-13T-C.

Water quality parameters for both setups were in the following ranges:

temperature	20-22 °C;
dissolved oxygen	1.1-7.6 mg/L;
pH	7.1-8.4;
salinity	26-33 ppt.

The 96-h LC50 value (the concentration at which 50% mortality occurred) for the reference toxicant was determined using the EFFL software program (Stephan, 1977). The 96-h LC50 value for cadmium was 7.955 mg/L for Setup #1 and 6.721 mg/L for Setup #2. The approximate 95% confidence limits were calculated using the binomial test and were determined to be 5.600 and 10.000 mg/L for Setup #1 and 3.200 and 10.000 for Setup #2.

3.3 Echinoderm Larvae Bioassay

Results of the sediment toxicity tests are summarized in Tables 5 and 6. Raw data and statistical printouts are provided in Appendices A and B. Mean percent mortality in the two control sediments for Setup #1 were -20.0 and -23.2%. Mean percent mortality in the two control seawaters for Setup #1 were -12.2 and -26.1%. Mean percent mortality in the two control sediments for Setup #2 were -6.5 and -9.4%. Mean percent mortality in the two control seawaters for Setup #2 were -10.1 and -11.0%. All these results met the specified control criteria (PSEP, 1991). Mean percent mortality in the Hylebos Waterway test sediments ranged from -33.2 to 50.4% in Setup #1 and in Setup #2 from -9.3 to 33.4%. Mean percent abnormality ranged from 3.2-17.9% in Setup #1 and in Setup #2 from 4.2-10.9%.

Water quality parameters for both setups were in the following ranges:

temperature	15.5-16.0 °C;
dissolved oxygen	5.0-8.1 mg/L;
pH	7.0-7.8;
salinity	30-32 ppt.

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Table 3. Summary of *Neanthes arenaceodentata* (Setup #1) sediment toxicity test results.

Sample ID	Mean Survival (%)	Mean Individual Biomass (mg)
Control 1	100	10.94
DAC-HY-13T	100	12.64
DAC-HY-14T	100	12.64
DAC-HY-15T	92	12.12
DAC-HY-16T	100	9.40
DAC-HY-18T	88	11.30
DAC-HY-19T	100	11.78
DAC-HY-21T	100	13.07
DAC-HY-22T	96	10.89
DAC-HY-24T	100	14.18
Control 2	100	11.65
DAC-HY-17T	100	10.60
DAC-HY-20T	100	10.62
DAC-HY-23T	100	11.49

Table 4. Summary of *Neanthes arenaceodentata* (Setup #2) sediment toxicity test results.

Sample ID	Mean Survival (%)	Mean Individual Biomass (mg)
Control 1	100	10.22
DAC-HY-4T	100	10.14
DAC-HY-6T	100	11.42
DAC-HY-7T	100	10.20
DAC-HY-9T	100	9.98
DAC-HY-10T	96	9.33
DAC-HY-12T	100	10.73
DAC-HY-26T	100	10.07
DAC-HY-27T	100	6.15
DAC-HY-28T	100	10.00
Control 2	100	9.67
DAC-HY-1T	100	10.12
DAC-HY-2T	96	7.36
DAC-HY-3T	100	10.37
DAC-HY-5T	92	12.58
DAC-HY-8T	96	11.48
DAC-HY-11T	100	9.10
DAC-HY-25T	96	9.18
DAC-CR-2T	92	9.93
DAC-CR-2AT	92	9.01

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Table 5. Summary of *Dendraster excentricus* (Setup #1) sediment toxicity test results.

Sample ID	Mean Mortality (%)	Mean Abnormal (%)
Control 1	-20.0	4.7
DAC-HY-8T	2.6	8.7
DAC-HY-9T	-12.6	17.9
DAC-HY-10T	26.5	8.7
DAC-HY-11T	17.9	3.2
DAC-HY-12T	8.2	4.5
DAC-HY-13T	19.7	8.4
DAC-HY-15T	6.6	9.2
DAC-HY-16T	1.7	7.8
DAC-HY-23T	21.7	8.1
Control 2	-23.2	4.8
DAC-HY-17T	-17.9	3.4
DAC-HY-18T	3.2	5.6
DAC-HY-19T	-25.1	3.4
DAC-HY-20T	50.4	13.6
DAC-HY-21T	-33.2	3.5
DAC-HY-22T	2.7	4.9

Table 6. Summary of *Dendraster excentricus* (Setup #2) sediment toxicity test results.

Sample ID	Mean Mortality (%)	Mean Abnormal (%)
Control 1	-6.5	5.0
DAC-HY-2T	-6.3	8.5
DAC-HY-5T	6.4	8.8
DAC-HY-24T	24.6	7.7
DAC-HY-26T	-9.2	10.9
DAC-CR-2T	33.4	9.1
DAC-CR-2AT	-1.9	6.6
Control 2	-9.4	5.6
DAC-HY-1T	-9.3	8.0
DAC-HY-3T	5.6	9.6
DAC-HY-4T	17.8	4.2
DAC-HY-6T	4.9	8.8
DAC-HY-7T	6.6	7.4
DAC-HY-14T	8.2	4.2
DAC-HY-25T	29.7	9.8
DAC-HY-27T	25.8	9.8
DAC-HY-28T	7.8	3.4

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The 48-h LC50 value (the concentration at which 50% mortality occurred) for the reference toxicant was determined using the EFFL software program (Stephan, 1977). The 48-h LC50 value for cadmium was 3.980 mg/L for Setup #1 and 9.108 mg/L for Setup #2. The approximate 95% confidence limits were calculated using the binomial test and were determined to be 3.200 and 5.600 mg/L for Setup #1 and 5.600 and + ∞ for Setup #2.

4.0 QA/QC REVIEW OF BIOASSAY DATA

4.1 Amphipod Bioassay (*Rhepoxynius abronius*)

Sediment testing using *R. abronius* were initiated on May 31 and June 3, 1994. These initiation dates were within the recommended holding time of 14 days. The tests were performed within the recommended water quality parameters, met minimum control survival standards, and the reference toxicant LC_{50} was within laboratory test history limits.

Replicates from three samples and one control were misseeded with twice the number of animals (i.e., 40 instead of 20). This was noted and all subsequent calculations for those samples were based on the actual number of animals placed in the jar. For one sample one replicate jar was lost during the test, so calculation of mean survival for this sample was based on four replicates.

4.2 Juvenile Polychaete Bioassay

Sediment testing using *Neanthes* were initiated on May 31 and June 3, 1994. These initiation dates were within the recommended holding time of 14 days. The tests were performed within the recommended water quality parameters, met minimum control survival standards, and the reference toxicant LC_{50} was within laboratory test history limits.

Replicates from two samples were misseeded with more animals than specified in the protocols. This was noted and all subsequent calculations for those samples were based on the actual number of animals placed in the jar. For one sample, one replicate jar (replicate C for sample DAC-HY-27T) was not seeded during the test, so calculation of mean survival for this sample was based on four replicates.

4.3 Echinoderm Larvae Bioassay

Sediment testing using the echinoderm larvae were initiated on June 8 and 9, 1994. These initiation dates were not within the recommended holding time of 14 days for samples DAC-HY-13 and DAC-HY-14. Tests were initiated on day 15 for both samples.

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The tests were performed within the recommended water quality parameters, met minimum control survival standards, and the reference toxicant LC_{50} was within laboratory test history limits.

4.4 Overall Summary

All data are deemed acceptable for use as outlined in the QAPP/LAP (EVS, 1994). None of the data require qualifications, although it is recommended that the deviations in bioassay testing discussed in this review be presented and discussed in the data report.

PRIVILAGED ATTORNEY WORK PRODUCT - FOIA EXEMPT - DO NOT DISCLOSE

5.0 REFERENCES

EVS, 1994. Commencement Bay Damage Assessment Studies: combined quality assurance project plan and laboratory analysis plan. Prepared by EVS cosultants, Seattle, WA: for the National Oceanic and Atmospheric Administration, Damage Assessment and Restoration Center, Seattle, WA.

Stephan, C.E. 1977. Methods for Calculating an LC_{50}. F.L. Mayer and J.L. Hamelink (eds.), Aquatic Toxicity and Hazard Evaluation ASTM STP 634, American Society of Testing and Materials, Philadelphia, PA, pp.65-84.

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APPENDIX A
Amphipod Bioassay
RAW DATA

PRIVILAGED ATTORNEY WORK PRODUCT - FOIA EXEMPT - DO NOT DISCLOSE

EVS CONSULTANTS

Amphipod Survival and Emergence Data

Client:	NOAA – Setup #1	Test Species:	*Rhepoxynius abronius*
Project #:	9/618–02.4	Date Initiated:	May 31, 1994
Work Order:	940225	Date Terminated:	June 10, 1994
Test Type:	10–d static marine sediment		
		Number of Test Organisms:	20

Sample ID	Rep	No. Survivors	No. Emerged Days 1–10	No. Failing to Reburrow	Mean Survival (%)	Mean Emergence (#/jar/day)	Reburial (%)
Control 1	A	20	0	0	97.0	0.2	100
	B	20	0	0			
	C	18	8	0			
	D	20	1	0			
	E	19	1	0			
DAC–HY–13T	A[1]	16	5	1	89.0	0.9	96
	B	19	8	0			
	C[1]	16	19	0			
	D	18	7	1			
	E	20	6	2			
DAC–HY–14T	A	20	2	1	97.0	0.8	84
	B	19	8	2			
	C	19	5	2			
	D	19	17	7			
	E	20	8	4			
DAC–HY–15T	A	16	11	0	86.0	0.7	94
	B	18	10	2			
	C	18	6	1			
	D	17	4	1			
	E	17	6	1			
DAC–HY–16T	A	16	5	1	88.0	0.5	92
	B	19	6	0			
	C	18	4	1			
	D	18	7	2			
	E	17	3	3			

1. A 0.5–cm crab was found in each of these replicates (DAC–HY–13T–A,C).

00536

Co data entry only

certified JLC
Aug 17, 1994

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EVS CONSULTANTS

Amphipod Survival and Emergence Data

Client:	NOAA – Setup #1	Test Species:	*Rhepoxynius abronius*
Project #:	9/618–02.4	Date Initiated:	May 31, 1994
Work Order:	940225	Date Terminated:	June 10, 1994
Test Type:	10–d static marine sediment		
		Number of Test Organisms:	20

Sample ID	Rep	No. Survivors	No. Emerged Days 1–10	No. Failing to Reburrow	Mean Survival (%)	Mean Emergence (#/jar/day)	Reburial (%)
DAC–HY–18T	A	17	5	1	86.0	0.8	95
	B	16	5	2			
	C	18	14	0			
	D	18	9	1			
	E	17	9	0			
DAC–HY–19T	A	19	5	0	91.0	1.1	92
	B	17	5	1			
	C[2]	37	16	6			
	D[2]	35	16	3			
	E[2]	37	13	2			
DAC–HY–21T	A	19	9	2	73.0	1.2	85
	B	16	8	1			
	C	14	18	3			
	D	8	16	2			
	E	16	9	3			
DAC–HY–22T	A	18	1	2	85.0	0.4	91
	B	16	8	3			
	C	19	5	2			
	D	13	1	1			
	E	19	4	0			
DAC–HY–24T	A	13	17	1	67.0	2.3	94
	B	12	21	0			
	C	12	36	0			
	D	13	13	2			
	E	17	28	1			

2. These replicates (DAC–HY–19T–C,D,E) appear to have been misseeded with 40 amphipods each. Calculations for this sample (DAC–HY–19T) were based on 160 total amphipods.

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00537

for data entry only

Certified JLL

EVS CONSULTANTS

Amphipod Survival and Emergence Data

Client:	NOAA – Setup #1	Test Species:	*Rhepoxynius abronius*
Project #:	9/618–02.4	Date Initiated:	May 31, 1994
Work Order:	940225	Date Terminated:	June 10, 1994
Test Type:	10–d static marine sediment		
		Number of Test Organisms:	20

Sample ID	Rep	No. Survivors	No. Emerged Days 1–10	No. Failing to Reburrow	Mean Survival (%)	Mean Emergence (#/jar/day)	Reburial (%)
Control 2	A	19	6	0	97.0	0.3	100
	B	20	0	0			
	C[3]	21	0	0			
	D	19	9	0			
	E	19	0	0			
DAC–HY–17T	A	15	5	0	84.0	0.2	89
	B	16	2	1			
	C	18	1	2			
	D	18	0	3			
	E	17	1	3			
DAC–HY–20T	A	18	5	0	84.0	0.7	96
	B	19	10	0			
	C	14	9	2			
	D	17	11	0			
	E	16	2	1			
DAC–HY–23T	A	16	2	1	84.0	1.0	86
	B[4]	34	16	6			
	C	17	8	2			
	D	16	14	2			
	E	18	11	3			

3. This replicate (Control 2–C) appears to have been misseeded with one extra amphipod. Calculations have been based on 101 total amphipods.
4. This replicate (DAC–HY–23T–B) appears to have been misseeded with 40 amphipods. Calculations have been based on 120 total amphipods.

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00540

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Aug 17, 1994

for data entry only

EVS CONSULTANTS - AMPHIPOD SEDIMENT TOXICITY TESTS
EMERGENCE, SURVIVAL AND DAY 10 WATER QUALITY

Water Quality Instruments Used

D.O. Meter II-A-19
pH Meter II-A-26
Salinity II-C-12
Temperature Hg. Thermometer

Client: N.O.A.A.
EVS Project No.: 9/619-02.4
EVS W.O. No.: 940225
Day 0: May 31, 1994
Day 10: June 10, 1994.
Test Species: L. abronius
Source/Collection Date: May 25, 1994
West Beach, Whidbey Island WA.

SAMPLE I.D. Control 1

Rep.	Number of Amphipods Emerged From Sediments at Days 1-10										Number Alive at Day 10	Number Failing to Rebury	Water Chemistry at Day 10			
	1	2	3	4	5	6	7	8	9	10			Temp. (°C)	Sal. (ppt)	D.O. (mg/L)	pH
A	0	0	0	0	0	0	0	0	0	0	20	0	16	28	7.8	7.7
B	0	0	0	0	0	0	0	0	0	0	20	0	16	28	7.8	7.7
C	1	1	1	1	1	1	1	0	0	~~0~~ 1	18	0	16	28	7.8	7.7
D	0	0	0	0	1	0	0	0	0	0	20	0	16	28	7.8	7.7
E	1	0	0	0	0	0	0	0	0	0	19	0	16	29	7.9	7.7
Tech'n	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

(# dead:# missing) - A(0 : 0) B(0 : 0) C(0 : 2) D(0 : 0) E(0 : 1)

SAMPLE I.D. DAC-HY-13T

Rep.	Number of Amphipods Emerged From Sediments at Days 1-10										Number Alive at Day 10	Number Failing to Rebury	Water Chemistry at Day 10			
	1	2	3	4	5	6	7	8	9	10			Temp. (°C)	Sal. (ppt)	D.O. (mg/L)	pH
A	0	0	0	0	0	1	0	1	3	0	16 (2)	1	16	29	8.1	7.9
B	0	0	0	0	0	0	0	1	2	5	19	0	16	29	7.9	7.8
C	0	1	3	2	1	1	2	2	4	3	16 (2)	0	16	29	~~7.0~~ 7.8	7.8
D	0	1	0	0	0	1	1	2	2	0	18	1	16	29	7.9	7.9
E	0	0	1	0	0	0	0	1	2	2	20	2	16	29	7.8	7.8
Tech'n	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

(# dead:# missing) - A(1 : 3) B(0 : 1) C(0 : 4) D(0 : 2) E(0 : 0)

SAMPLE I.D. DAC-HY-16T

Rep.	Number of Amphipods Emerged From Sediments at Days 1-10										Number Alive at Day 10	Number Failing to Rebury	Water Chemistry at Day 10			
	1	2	3	4	5	6	7	8	9	10			Temp. (°C)	Sal. (ppt)	D.O. (mg/L)	pH
A	0	0	1	0	0	0	2	1	0	1	~~19~~ 16	1	16	30	8.1	8.0
B	1 (1)	0	0	0	0	0	0	3	1	1	19	0	16	29	8.2	7.9
C	0	0	1	0	0	0	0	2	0	1	18	1	16	29	8.0	8.0
D	1	0	1	0	0	1	0	1	1	2	18	2	16	29	8.2	8.0
E	0	0	1	0	0	0	1	0	1	0	~~19~~ 17	3	16	30	8.2	8.0
Tech'n	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

(# dead:# missing) - A(0 : 4) B(0 : 1) C(0 : 2) D(0 : 2) E(0 : 3)

(1) floater (reembarged.)

(2) ≈0.5cm crab found within sediment [illegible]

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EVS CONSULTANTS - AMPHIPOD SEDIMENT TOXICITY TESTS
EMERGENCE, SURVIVAL AND DAY 10 WATER QUALITY

Water Quality Instruments Used

D.O. Meter II-A-19
pH Meter II-A-26
Salinity II-C-12
Temperature Hg Thermometer

Client: N.O.A.A.
EVS Project No.: 91619-02.4
EVS W.O. No.: 940225
Day 0: May 31, 1994
Day 10: June 10, 1994
Test Species: R. abronius
Source/Collection Date: May 25, 1994
West Beach, Whidbey Island WA

SAMPLE I.D. DAC-HY-21T

Rep.	Number of Amphipods Emerged From Sediments at Days 1-10										Number Alive at Day 10	Number Failing to Rebury	Water Chemistry at Day 10			
	1	2	3	4	5	6	7	8	9	10			Temp. (°C)	Sal. (ppt)	D.O. (mg/L)	pH
A	0	1,1	0	0	0	0	0	4	2	1	19	2	16	30	7.5	8.2
B	0	2	1	0	0	1	0	1	2	1	16	1	16	30	7.7	8.3
C	1,1 ①	6	1,1	0	0	0	1	1	2	4	14	3	16	29	7.1	7.9
D	7	1 ②	6	2	0	0	0	0	0	0	8	2	16	31	7.5	8.3
E	0	1	0	0	0	0	1	5	1	1	16	3	16	30	7.6	8.3
Tech'n	JM	PJ	PJ	[illegible]	[illegible]	[illegible]	JM	PJ	PJ	JM	[illegible]	[illegible]	PJ	JM	PJ	PJ

(# dead:# missing) - A(0:1) B(2:2) C(2:4) D(2:10) E(0:4)

SAMPLE I.D. DAC-HY-24T

Rep.	Number of Amphipods Emerged From Sediments at Days 1-10										Number Alive at Day 10	Number Failing to Rebury	Water Chemistry at Day 10			
	1	2	3	4	5	6	7	8	9	10			Temp. (°C)	Sal. (ppt)	D.O. (mg/L)	pH
A	1	1	1	0	0	1	2	2	6	3	13	1	16	29	7.9	8.0
B	1	1	1	2	1	2	3	4	5	1	12	0	16	29	7.8	7.9
C	1	0	6	4	5	3	2	6	5	4	12	0	16	29	7.8	8.1
D	0	1	0	1	0	0	2	3	3	3	13	2	16	29	7.6	7.8
E	0	1 ②	2	1	1	2	4	1	9	7	17	1	16	29	7.6	8.1
Tech'n	JM	PJ	PJ	[illegible]	[illegible]	[illegible]	JM	PJ	PJ	JM	JM	JM	PJ	PJ	PJ	PJ

(# dead:# missing) - A(0:7) B(4:34) C(2:6) D(0:2) E(0:3)

SAMPLE I.D. DAC-HY-19T

Rep.	Number of Amphipods Emerged From Sediments at Days 1-10										Number Alive at Day 10	Number Failing to Rebury	Water Chemistry at Day 10			
	1	2	3	4	5	6	7	8	9	10			Temp. (°C)	Sal. (ppt)	D.O. (mg/L)	pH
A	0	0	0	0	0	0	2	1	1	1	19	0	16	29	7.8	7.9
B	1	0	0	0	0	0	0	1	2	1	17	1	16	30	7.9	8.0
C	1	0	1	0	0	0	4	3	4	3	37 ③	6	16	31	7.6	7.8
D	4,3 ①	1 ②	3	1	0	1	0	1	1	1	35 ③	3	16	30	7.8	7.7
E	1 ①	4,4	0	1	1	1	0	2	0	1	37 ③	2	16	29	8.0	7.8
Tech'n	JM	PJ	PJ	[illegible]	[illegible]	[illegible]	JM	PJ	PJ	JM	PJ	PJ	PJ	PJ	PJ	PJ

(# dead:# missing) - A(0:1) B(0:3) C(1:2) D(0:5) E(0:3)

① floats (submerged) ③ double seeded, divided by 2 for statistical analysis.
② floater (didn't resubmerge)

00542

GAM July 14/94

EVS CONSULTANTS - AMPHIPOD SEDIMENT TOXICITY TESTS
EMERGENCE, SURVIVAL AND DAY 10 WATER QUALITY

Water Quality Instruments Used

D.O. Meter II-A-19
pH Meter II-A-26
Salinity II-C-12
Temperature Hg Thermometer

Client: N.O.A.A.
EVS Project No.: 9/619-02.4
EVS W.O. No.: 940225
Day 0: May 31, 1994
Day 10: June 10, 1994
Test Species: R. abronius
Source/Collection Date: May 25, 1994
West Beach, Whidbey Island, WA.

SAMPLE I.D. DAC-HY-14T

Rep.	Number of Amphipods Emerged From Sediments at Days 1-10										Number Alive at Day 10	Number Failing to Rebury	Water Chemistry at Day 10			
	1	2	3	4	5	6	7	8	9	10			Temp. (°C)	Sal. (ppt)	D.O. (mg/L)	pH
A	0	0	0	0	0	0	0	1	0	1	20	1	16	30	8.1	7.8
B	0	0	0	0	0	1	1	1	4	1	19	2	16	30	7.8	7.7
C	0	0	0	0	0	0	0	1	4	0	19	2	16	31	8.0	7.8
D	0	0	1	1	0	3	2	4	1	4	19	7	16	29	7.9	7.7
E	0	0	1	0	0	0	1	1	3	2	20	4	16	30	8.0	7.8
Tech'n	[illegible]										[illegible]	[illegible]				

(# dead:# missing) - A(0:0) B(0:1) C(0:1) D(1:0) E(0:0)

SAMPLE I.D. DAC-HY-18T

Rep.	Number of Amphipods Emerged From Sediments at Days 1-10										Number Alive at Day 10	Number Failing to Rebury	Water Chemistry at Day 10			
	1	2	3	4	5	6	7	8	9	10			Temp. (°C)	Sal. (ppt)	D.O. (mg/L)	pH
A	0	0	0	0	1	0	0	1	2	1	17	1	16	31	8.0	7.9
B	1	2	1	0	0	0	0	0	1	0	16	2	16	30	8.0	8.0
C	0	0	1	1	0	0	2	2	2	6	19	0	16	29.5	7.8	7.8
D	0	0	3	2	1	0	0	1	1	1	18	1	16	30	7.85	7.8
E	0	0	0	1	0	1	1	4	2	0	17	0	16	30	7.8	7.8
Tech'n	[illegible]										KLV	KLV				

(# dead:# missing) - A(3:0) B(2:2) C(2:0) D(2:0) E(3:0)

SAMPLE I.D. DAC-HY-15T

Rep.	Number of Amphipods Emerged From Sediments at Days 1-10										Number Alive at Day 10	Number Failing to Rebury	Water Chemistry at Day 10			
	1	2	3	4	5	6	7	8	9	10			Temp. (°C)	Sal. (ppt)	D.O. (mg/L)	pH
A	0	0	0	0	1	3	1	2	3	1	16	KLV+0	15.5	30	8.2	7.8
B	0	0	0	0	0	2	3	1	3	2	18 KLV	2	15.5	31	8.0	7.8
C	0	0	1	0	0	0	0	2+2	1	2	18	1	15.5	31	8.0	7.9
D	0	0	0	0	1	0	1	0	2	0	17	1	15.5	30	8.0	7.9
E	0	0	0	0	0	0	1	2	2	1	17	1	15.5	31	7.9	7.9
Tech'n	[illegible]										KLV	KLV				

(# dead:# missing) - A(3:1) B(2:0) C(2:0) D(2:1) E(3:0)

① floater

08543

EVS CONSULTANTS - AMPHIPOD SEDIMENT TOXICITY TESTS
EMERGENCE, SURVIVAL AND DAY 10 WATER QUALITY

Water Quality Instruments Used

D.O. Meter II-A-19
pH Meter II-A-26
Salinity II-C-12
Temperature Hg Thermometer

Client: N.O.A.A.
EVS Project No.: 9168-02.4
EVS W.O. No.: 940225
Day 0: May 31, 1994
Day 10: June 10, 1994
Test Species: R. abronius
Source/Collection Date: May 25, 1994
West Beach, Whidbey Island Wa.

SAMPLE I.D. DAC-HY-22T

Rep.	Number of Amphipods Emerged From Sediments at Days 1-10										Number Alive at Day 10	Number Failing to Rebury	Water Chemistry at Day 10			
	1	2	3	4	5	6	7	8	9	10			Temp. (°C)	Sal. (ppt)	D.O. (mg/L)	pH
A	0	0	0	0	0	0	0	0	1	0	18	2	15.5	30	8.0	7.9
B	0	0	0	1	1	1	2	0	3	0	16	3	15.5	30	8.0	7.9
C	0	0	0	0	0	0	2	2	1	0	19	2	15.5	30	7.7	7.8
D	0	0	0	0	0	0	1	0	0	0	13	1	15.5	29	7.6	7.9
E	0	0	0	0	0	0	0	2	1	1	18/19	0	15.5	29	8.1	7.9
Tech'n																

(# dead:# missing) - A(1:1) B(0:4) C(0:1) D(0:7) E(0:1)

SAMPLE I.D. Control 2

Rep.	Number of Amphipods Emerged From Sediments at Days 1-10										Number Alive at Day 10	Number Failing to Rebury	Water Chemistry at Day 10			
	1	2	3	4	5	6	7	8	9	10			Temp. (°C)	Sal. (ppt)	D.O. (mg/L)	pH
A	1	1	1	0	0	1	0	0	1	0	19	0	16.5	29	8.0	7.7
B	0	0	0	0	0	0	0	0	0	0	20	0	15.5	28	8.2	7.8
C	0	0	0	0	0	0	0	0	0	0	20	0	15.5	29	8.2	7.8
D	1	1	1	1	0	1	1	1	1	1	19	0	15.5	29	8.2	7.8
E	0	0	0	0	0	0	0	0	0	0	20	0	15.5	28	8.2	7.8
Tech'n																

(# dead:# missing) - A(0:1) B(0:0) C(1:0) D(0:1) E(0:0) F(0:1)

SAMPLE I.D. DAC-HY-23T

Rep.	Number of Amphipods Emerged From Sediments at Days 1-10										Number Alive at Day 10	Number Failing to Rebury	Water Chemistry at Day 10			
	1	2	3	4	5	6	7	8	9	10			Temp. (°C)	Sal. (ppt)	D.O. (mg/L)	pH
A	0	0	0	0	0	0	1	0	0	1	17	1	15.5	30	7.8	7.8
B	1	2	0	0	0	0	1	1	4	5	34	6	15.5	29	7.8	7.7
C	1	0	0	4	0	0	1	0	1	1	17	2	15.5	30	8.0	7.8
D	0	0	0	2	0	1	2	2	6	1	16	2	15.5	29	7.7	7.7
E	1	0	2	1	0	0	4	2	1	1	18	3	15.5	30	7.8	7.8
Tech'n																

(# dead:# missing) - A(1:3) B(3:3) C(1:2) D(1:3) E(0:2)

① Lost (recontinued) ② dead ③ 21 EVS counted amphipods found ④ double counted

00544

Cntrl duty 6/14/94

EVS CONSULTANTS - AMPHIPOD SEDIMENT TOXICITY TESTS
EMERGENCE, SURVIVAL AND DAY 10 WATER QUALITY

Water Quality Instruments Used

D.O. Meter II-A-19
pH Meter II-A-26
Salinity II-C-12
Temperature Hg Thermometer

Client: N.O.A.A.
EVS Project No.: 9/618-02.4
EVS W.O. No.: 940225
Day 0: May 31, 1994
Day 10: June 10, 1994
Test Species: R. abronius
Source/Collection Date: May 25, 1994
West Beach, Whidbey Island WA

SAMPLE I.D. DAC-HY-20T

Rep.	Number of Amphipods Emerged From Sediments at Days 1-10										Number Alive at Day 10	Number Failing to Rebury	Water Chemistry at Day 10			
	1	2	3	4	5	6	7	8	9	10			Temp. (°C)	Sal. (ppt)	D.O. (mg/L)	pH
A	0	0	0	0	1	0	0	0	2	2	KV ~~9~~ 18	0	15.5	30	7.6	7.9
B	0	0	0	0	0	0	2	2	2	4	KV ~~20~~ 19	0	15.5	30	7.8	8.0
C	0	1	0	0	0	0	1	2	3	2	14	2	15.5	29	7.9	7.9
D	1	1	1	0	0	2	2	2	1	1	17	0	15.5	30	7.6	7.8
E	1	0	0	1	0	0	0	0	0	0	16	1 ~~2~~ KV	15.5	30	7.9	8.0
Tech'n	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	KLV	KLV	[illegible]	[illegible]	[illegible]	[illegible]

(# dead:# missing) - A(~~0~~ 1 KV : 1) B(~~0~~ 1 KV : 0) C(6:0) D(1:2) E(2:2)

SAMPLE I.D. DAC-HY-17T

Rep.	Number of Amphipods Emerged From Sediments at Days 1-10										Number Alive at Day 10	Number Failing to Rebury	Water Chemistry at Day 10			
	1	2	3	4	5	6	7	8	9	10			Temp. (°C)	Sal. (ppt)	D.O. (mg/L)	pH
A	1	0	1	0	0	0	1	1	1	0	15	0	15.5	29	7.8	7.9
B	0	1	0	0	0	0	0	1	0	0	16	1	15.5	29	7.8	7.9
C	0	0	0	0	0	0	0	0	0	1	18	2	15.5	30	7.6	7.9
D	0	0	0	0	0	0	0	0	0	0	18	3	15.5	29	8.0	7.9
E	0	0	1	0	0	0	0	0	0	0	17	3	15.5	29	7.8	7.9
Tech'n	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	KLV	KLV	[illegible]	[illegible]	[illegible]	[illegible]

(# dead:# missing) - A(2 : ~~0~~ KV 3) B(2:2) C(2:0) D(2:0) E(1:2)

SAMPLE I.D. _____

Rep.	Number of Amphipods Emerged From Sediments at Days 1-10										Number Alive at Day 10	Number Failing to Rebury	Water Chemistry at Day 10			
	1	2	3	4	5	6	7	8	9	10			Temp. (°C)	Sal. (ppt)	D.O. (mg/L)	pH
A																
B																
C																
D																
E																
Tech'n																

(# dead:# missing) - A(:) B(:) C(:) D(:) E(:)

① Monter.

00545 [illegible] July 14/94

[illegible]\amphipod.1

#1 Page No. 8/9

EVS CONSULTANTS
ACUTE TOXICITY TEST DATA

SAMPLE ID: Cadmium ~~Cd~~ Rettox lot #94-009
DATE ~~COLLECTED~~ Hole Ch. April 26, 1994
TEST DATE/TIME May 31, 1994
NO. ORGANISMS/VOLUME 10 / 1L

PROJECT NAME NOAA
EVS PROJECT NO. 91618-02.4
WORK ORDER NO. 940225
TEST SPECIES Rhepoxinius abronius
SOURCE & BATCH Whidbey Island May 25/94 West Beach, WA

00546

CONC'N (mg/L) Cd	PERCENT SURVIVAL (1 to 96 hours)							DISSOLVED OXYGEN (mg/L)					TEMPERATURE (°C)					pH					SALINITY (ppt)	
	1	2	4	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	96
3.2	100			100	100	70	0	8.2	8.2	8.6	8.3	7.6	17	15.5	15.5	15.5	15.5	7.8	7.8	8.0 ~~7.8~~	8.0	7.7	27	28
1.8	100			100	100	90 ①	10	8.2	8.2	8.7	8.3	7.6	17	15.5	15.5	15.5	15.5	7.8	7.8	7.9	7.9	7.7	27	28
1.0	100			100	80	60	60	8.2	8.0	8.6	8.3	7.6	17	15.5	15.5	15.5	15.5	7.8	7.9	7.9	7.8	7.8	27	28
0.56	100			100	100	100 ①	70	8.2	8.2	8.6	8.2	7.6	17	15.5	15.5	15.5	15.5	7.8	7.9	7.8	7.9	7.7	27	27
0.32	100			100	100	100	90	8.2	8.2	8.6	8.2	7.8	17	15.5	15.5	15.5	15.5	7.8	7.8	7.9	7.9	7.7	26	28
0.18	100			100	100	100	90	8.2	8.1	8.6	8.2	7.6	17	15.5	15.5	15.5	15.5	7.8	7.9	7.9	7.8	7.6	27	29
0.10	100			100	100	100	90	8.0	8.1	8.7	8.0	7.5	17	15.5	15.5	15.5	15.5	7.8	7.9	7.9	7.8	7.7	27	28
Control	100			100	100	100	90	8.2	8.0	8.6	8.2	7.5	16	15.5	15.5	15.5	15.5	7.8	7.8	7.8	7.9	7.6	~~28~~	28
Technician	JM			JM	B	PLS/CEB	CEB/A	B	JM	B	PLS/CEB	EJT/LS	B	JM	B	PLS/CEB	EJT/LS	B	JM	B	PLS/CEB	EJT/LS	B	EJT

SAMPLE DESCRIPTION
COMMENTS Cd Rettox stock solution at 1000 mg/L
① on floater

TEST SET UP BY: CEB, B
DATA VERIFIED BY: Judith Crane
DATE VERIFIED: August 12, 1994

EVS ENVIRONMENT CONSULTANTS

LC50:STEPHEN IBM/AT VERS 1.0

FILE: 9/618-02.4 940225 NOAA-Setup #1

TEST: Reference Toxicant
SPECIES: Rhepoxynius abronius
CHEMICAL: Cadmium
CARRIER: Seawater

DATE: May 31, 1994
DURATION: 96 hr
CARRIER CONC: 30 ppt

Sample: Reference Toxicant

Conc	Number exposed	Number dead	Percent dead	Binomial prob(percent)
3.20	10	10	100.0	0.0977
1.80	10	9	90.0	1.0742
1.00	10	4	40.0	37.6953
0.56	10	3	30.0	17.1875
0.32	10	1	10.0	1.0742
0.18	10	1	10.0	1.0742
0.10	10	1	10.0	1.0742

The binom test shows that 0.320 and 1.800 can be used as statistically sound at 95 conf since the actual conf level associated with these limits is 97.852

An approx LC50 is 1.113 mg/L Cd

------RESULTS USING THE MOVING AVERAGE METHOD----------

span	g	lc50	95% conf limits	
5	0.083877	0.828	0.593	1.240
4	0.167754	0.879	0.604	1.212
3	0.269420	0.914	0.648	1.486
2	0.509802	0.982	0.574	1.612
1	0.720682	1.113	0.329	1.438

Probit warning:no convergence in 25 iterations

00547

certified JLC
Aug 12, 1994

E.V.S. CONSULTANTS - AMPHIPOD SEDIMENT BIOASSAYS
DAILY WATER QUALITY CHEMISTRY MONITORING

Water Quality Instruments Used

D.O. Meter II-A-19.
pH Meter II-A-26.
Salinity II-C-12.
Temperature Hg. Thermometer

Client N.O.A.A. Setup # ①
EVS Project No.: 9/6/18-02.4
EVS W.O. No.: 940225
Day 0: May 31, 1994
Day 10: June 10, 1994
Test Species: R. abronius.
Source and Collection Date: May 25 1994 Whidbey Island, West Beach, WA.

SAMPLE I.D.	TEMPERATURE (C)											SALINITY (ppt)											DISSOLVED OXYGEN (mg/L)											pH										
	0	1	2	3	4	5	6	7	8	9	10	0	1	2	3	4	5	6	7	8	9	10	0	1	2	3	4	5	6	7	8	9	10	0	1	2	3	4	5	6	7	8	9	10
Control 1	15.5	15	15.5	15.5	15.5	16	15.5	15.5	15.5	15.5	16	27	27	27	27	28	28	27	27	28	27	27	8.3	8.3	8.3	8.2	7.9	8.1	8.2	8.2	8.2	8.0	8.2	7.8	7.8	7.7	7.9	7.6	7.7	7.7	7.8	7.7	7.9	7.7
DAC-HY-13T	15.5	15	15.5	15.5	15.5	16	15.5	15.5	15.5	15.5	16	27	28	27	28	28	28	28	29	29	28	29	8.4	8.0	8.4	8.2	7.7	8.1	8.1	8.0	7.7	8.1	8.0	7.8	7.8	7.7	7.9	7.7	7.7	7.7	7.6	7.9	7.8	7.7
DAC-HY-16T	15.5	15	15.5	15.5	15.5	16	15.5	15.5	15.5	15.5	16	28	28	28	29	28	29	29	29	29	28	28	8.1	8.1	8.4	8.1	7.5	7.6	8.2	7.6	7.5	8.0	8.2	7.8	7.8	7.8	7.9	7.7	7.7	7.6	7.9	7.8	7.9	8.0
DAC-HY-21T	15.5	15	15.5	15.5	15.5	16	15.5	15.5	15.5	15.5	16	28	28	27	28	29	28	28	30	29	29	28	8.0	8.9	8.2	8.0	7.5	8.0	8.4	7.7	7.6	8.0	8.1	7.8	7.8	7.8	7.9	7.7	8.0	8.2	8.1	8.2	8.1	8.2
DAC-HY-24T	15.5	15	15.5	15.5	15.5	16	15.5	15.5	15.5	15.5	16	27	28	27	28	29	28	28	30	29	29	28	8.0	9.0	8.1	8.0	7.6	7.7	8.5	7.9	7.8	8.1	7.8	7.8	7.8	7.8	7.9	7.7	8.0	8.1	8.2	8.3	8.3	8.3
DAC-HY-19T-	15.5	15	15.5	15.5	15.5	16	15.5	15.5	15.5	15.5	16	28	29	27	28	29	29	29	30	29	28	29	8.4	8.0	8.4	8.2	7.6	8.1	8.6	7.9	7.8	8.1	7.8	7.8	7.8	7.8	8.0	7.7	8.3	8.1	8.3	8.2	8.3	8.0
DAC-HY-14T	15.5	15	15.5	15.5	15.5	16	15.5	15.5	15.5	15.5	16	28	28	27	28	29	28	29	30	29	28	30	8.2	8.1	8.2	8.2	7.6	8.1	8.1	7.9	7.9	8.2	8.0	7.8	7.9	7.7	8.0	7.7	8.0	7.9	7.9	7.9	8.0	8.0
DAC-HY-18T	15.5	15	15.5	15.5	15.5	16	15.5	15.5	15.5	15.5	16	28	28	28	28	29	29	29	30	29	28	29	8.2	8.0	8.4	8.3	7.5	7.7	8.8	8.0	7.6	8.2	7.8	7.8	7.9	7.7	7.9	7.6	7.7	7.7	7.8	7.8	7.9	7.9
DAC-HY 15T	15.5	15	15.5	15.5	15.5	16	15.5	15.5	15.5	15.5	15.5	29	29	27	29	29	28	30	32	30	29	29	8.4	9.3	8.4	8.4	7.6	8.0	8.8	8.0	7.6	8.2	7.8	7.8	7.9	7.9	7.9	7.8	8.0	8.2	8.0	8.2	8.1	8.1
DAC-HY-22T	15.5	15	15.5	15.5	15.5	16	15.5	15.5	15.5	15.5	15.5	29	29	27	28	29	29	29	29	28	29	29	7.4	8.0	8.5	8.2	7.6	8.1	8.1	7.9	7.7	8.1	7.9	7.8	7.9	7.9	7.9	7.6	7.9	7.8	7.8	7.8	7.9	8.1
Technician																																												

Comments/Adjustments Made: ① II-C-11 refractometer used.

All entries are to be made with black, ball-point pen. Cross out errors with a single line and initial and date corrections. Do not use "White-Out".

E.V.S. CONSULTANTS - AMPHIPOD SEDIMENT BIOASSAYS
DAILY WATER QUALITY CHEMISTRY MONITORING

Client: N.O.A.A.
EVS Project No.: 9/618-024
EVS W.O. No.: 990225
Day 0: May 31, 1994
Day 10: June 10, 1994
Test Species: R. abronius
Source and Collection Date: May ~~15~~ 25, 1994
West Beach, Whidbey Island WA.

Water Quality Instruments Used

D.O. Meter II-A-19
pH Meter II-A-26.
Salinity II-C-12.
Temperature Hg. Thermometer

SAMPLE I.D.	TEMPERATURE (°C) 0	1	2	3	4	5	6	7	8	9	10
Control 2.	15.5	15.	15.5	15.5	15.5	16	15.5	15.5	15.5	15.5	15.5
DAC-HY-23T	15.5	15	15.5	15.5	15.5	16	15.5	15.5	15.5	15.5	15.5
DAC-HY-20T	15.5	15	15.5	15.5	15.5	16	15.5	15.5	15.5	15.5	15.5
DAC-HY-17T	15.5	15	15.5	15.5	15.5	16	15.5	15.5	15.5	15.5	15.5
Technician	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

SAMPLE I.D.	SALINITY (ppt) 0	1	2	3	4	5	6	7	8	9	10
Control 2.	28	28	27	28	29	28	29	29	29	30	29
DAC-HY-23T	28	28	27	28	28	28	28	29	28	29	29
DAC-HY-20T	28	28	27	29	29	28	29	30	29	29	29
DAC-HY-17T	28	28	27	29	29	28	29	29	29	29	30
Technician	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

SAMPLE I.D.	DISSOLVED OXYGEN (mg/L) 0	1	2	3	4	5	6	7	8	9	10
Control 2.	8.3	8.2	8.5	8.3	7.7	8.1	8.9	[illegible]	8.0	8.4	8.2
DAC-HY-23T	8.3	8.0	8.4	8.2	7.6	8.1	8.8	[illegible]	7.8	8.2	7.8
DAC-HY-20T	8.2	8.2	8.5	8.3	7.7	8.1	8.8	[illegible]	7.8	8.1	7.8
DAC-HY-17T	8.2	8.2	8.4	8.2	7.6	8.0	8.8	7.9	7.8	8.3	8.1
Technician	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

SAMPLE I.D.	pH 0	1	2	3	4	5	6	7	8	9	10
Control 2.	7.8	7.9	7.9	7.9	7.6	7.9	7.8	7.8	7.8	7.9	7.8
DAC-HY-23T	7.8	7.8	7.8	7.9	7.7	7.9	7.8	7.8	7.7	7.9	7.9
DAC-HY-20T	7.8	7.8	7.9	7.9	7.7	8.0	7.8	7.8	7.9	7.8	8.0
DAC-HY-17T	7.8	7.9	8.0	7.9	7.7	7.9	7.9	7.8	7.8	7.9	7.9
Technician	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Comments/Adjustments Made: ① II-C-11 ema refractometer used.

All entries are to be made with black, ball-point pen. Cross out errors with a single line and initial and date corrections. Do not use "White-Out".

GH July 14/94

00549

at the start of the test. Final worm weight for each replicate was determined by drying all survivors at 50°C for 24 hours and weighing to the nearest 0.1 mg.

QA/QC procedures for the juvenile polychaete bioassay include the use of a reference sediment, positive and negative controls, and daily measurement of water quality conditions (i.e., temperature, salinity, pH, dissolved oxygen) in each test chamber. Water quality measurements were made just prior to seawater placement. A performance standard of no more than 10 percent mortality in the control replicates was used to assess test acceptability. If the control standard is exceed (i.e., mortality greater than 10 percent for the controls) then the data will either be rejected, or, based on evaluation of other performance measures (e.g., positive control and reference sediment survival rates), the data may be qualified and accepted for analysis. In the present study, cadmium chloride was used as the reference toxicant and a sediment from West Beach, Whidbey Island, Washington, was used as the negative control. No performance criteria have been established for the growth endpoint for this test.

2.3 Echinoderm Larvae Bioassay

Stocks of mature, adult echinoderms were obtained from the EVS marine laboratory. Adult sand dollars were spawned in the laboratory by injecting 0.5M KCl into the coelomic cavity. Prior to spawning of the adults, five replicate test beakers were prepared for each sample. Twenty grams (20 g) of sediment were added to each beaker; clean seawater was added up to 1 liter to make a final concentration in all containers of 20 grams (wet weight) of sediment per liter of seawater. Sediments were suspended by vigorous shaking for 10 seconds then allowed to settle for four hours prior to adding the embryos. For each bioassay replicate, approximately 20,000 to 40,000 embryos were added to a 1-liter test chamber within 2 hours of fertilization. The embryo concentration at test initiation (T_0 hours) was confirmed by collecting replicate 10 ml samples from control cultures and preserving them in 5-percent buffered formalin. After a 48-hour incubation period, the water and larvae overlying the settled sediment in each beaker was decanted into a clean 1-liter beaker and the water mixed thoroughly. A 10-ml aliquot was removed from each sample and placed into a vial. The contents of vial were preserved in 5-percent buffered formalin. Preserved samples were examined for normal and abnormal larval development. Abnormal development is defined as failure to develop the echinopluteus stage. Percent survival for each replicate bioassay was based on the number of larvae surviving in each test container relative to the initial number; percent abnormal development for each replicate was based on the number of survivors that are abnormal.

QA/QC procedures for the echinoderm larval bioassay include the use of a reference sediment, positive and negative controls, and measurement of water quality conditions (i.e., temperature, salinity, pH, dissolved oxygen). Water quality measurements were made daily in the replicates prepared specifically for monitoring water quality. Ammonia-nitrogen was measured in a subsample of water from the water quality control beaker for each sediment sample and from the

PRIVILAGED ATTORNEY WORK PRODUCT - FOIA EXEMPT - DO NOT DISCLOSE

1988 Triumph Street, Vancouver, B.C., Canada V5L 1K5
FAX: (604) 253-6700 TEL: (604) 253-4188

Rhepoxynius 9/618-02.4
W.O.# 940225

Setup #1 Day 0

analytical
service
laboratories
ltd.

CHEMICAL ANALYSIS REPORT

Date: June 8, 1994

ASL File No. D9740

Report On: 9/618.02.4 Water Analysis

Report To: **EVS Environment Consultants**
195 Pemberton Avenue
North Vancouver, BC
V7P 2R4

Attention: **Ms. Kathie Vilkas**

Received: June 1, 1994

ASL ANALYTICAL SERVICE LABORATORIES LTD.
per:

Heather A. Ross, B.Sc.
Project Chemist

Katherine Thomas, B.Sc.
Project Chemist

00553

Rhepoxynius 91618-02.4 Setup # 1 Day 0
W.O. # 940225

ASL

RESULTS OF ANALYSIS - Water

File No. D9740

		DAC-HY-13	DAC-HY-14	DAC-HY-15	DAC-HY-16	DAC-HY-17
Nutrients						
Ammonia Nitrogen	N	0.639	0.569	0.680	0.424	0.294
Inorganic Parameters						
Sulphide	S	0.06	<0.02	<0.02	<0.02	0.04

Results are expressed as milligrams per litre.
< = Less than the detection limit indicated.

00554

Khepokynius 4/618-02.4 Setup # 1 Day 0
W.O. # 940225

ASL

RESULTS OF ANALYSIS - Water **File No. D9740**

		DAC-HY-18	DAC-HY-19	DAC-HY-20	DAC-HY-21	DAC-HY-22
Nutrients						
Ammonia Nitrogen	N	0.600	2.45	0.522	0.677	0.572
Inorganic Parameters						
Sulphide	S	0.05	<0.02	<0.02	<0.02	0.03

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Results are expressed as milligrams per litre.
< = Less than the detection limit indicated.

00555

Khepokynius 91618-02-T Setup #1 Day 0
W.O.# 940225

ASL

RESULTS OF ANALYSIS - Water

File No. D9740

		DAC-HY-23	DAC-HY-24	Control 1	Control 2
Nutrients					
Ammonia Nitrogen	N	0.583	0.654	0.499	0.506
Inorganic Parameters					
Sulphide	S	<0.02	<0.02	<0.02	<0.02

Results are expressed as milligrams per litre.
< = Less than the detection limit indicated.

00556

Rhepoxynius 9/618+02.4 Setup #1 Day 0
W.O. 940225

ASL

METHODOLOGY File No. D9741

Samples were analyzed by methods acceptable to the appropriate regulatory agency. Outlines of the methodologies utilized are as follows:

Conventional Parameters in Water

These analyses are carried out in accordance with procedures described in "Standard Methods for the Examination of Water and Wastewater" 18th Ed. published by the American Public Health Association, 1992. Further details are available on request.

End of Report

00557

1988 Triumph Street, Vancouver, B.C., Canada V5L 1K5

analytical service laboratories ltd.

FAX: (604) 253-6700 TEL: (604) 253-4188

Rhepokynius 9/618-02.4 D.# 940225

JUN 27 1994

Setup # 1 Day 10

CHEMICAL ANALYSIS REPORT

Date:	June 20, 1994
ASL File No.	E1114
Report On:	9/618-02.4 Water Analysis
Report To:	**EVS Environment Consultants** 195 Pemberton Avenue North Vancouver, BC V7P 2R4
Attention:	**Ms. Kathie Vilkas**
Received:	June 10, 1994

ASL ANALYTICAL SERVICE LABORATORIES LTD.
per:

Heather A. Ross, B.Sc.
Project Chemist

Katherine Thomas, B.Sc.
Project Chemist

00558

Rhepoxynius 9/618-02.4 — Setup #1 Day 10
W.O.# 940225

REMARKS

File No. E1114

As indicated on the sample submission form, these samples are identified as "Day 10, Teardown (June 10, 1994), Rhipox #1".

00559

Rhepoxynius 71018-02.4
W.O.# 940225

Setup# 1 Day 10

ASL

RESULTS OF ANALYSIS - Water

File No. E1114

		DAC-HY-13 R	DAC-HY-14 R	DAC-HY-15 R	DAC-HY-16 R	DAC-HY-17 R
		94 06 10	94 06 10	94 06 10	94 06 10	94 06 10
Nutrients						
Ammonia Nitrogen	N	0.12	0.19	0.07	0.13	0.41
Inorganic Parameters						
Sulphide	S	<0.02	<0.02	<0.02	<0.02	<0.02

Remarks regarding the analyses appear at the beginning of this report.
Results are expressed as milligrams per litre.
< = Less than the detection limit indicated.

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Rheporynius 9/618-024
W.O.# 940225

Setup #1 Day 10

ASL

RESULTS OF ANALYSIS - Water

File No. E1114

		DAC-HY-18 R	DAC-HY-19 R	DAC-HY-20 R	DAC-HY-21 R	DAC-HY-22 R
		94 06 10	94 06 10	94 06 10	94 06 10	94 06 10
Nutrients						
Ammonia Nitrogen	N	0.33	1.34	0.80	2.05	1.23
Inorganic Parameters						
Sulphide	S	<0.02	<0.02	<0.02	<0.02	0.03

Remarks regarding the analyses appear at the beginning of this report.
Results are expressed as milligrams per litre.
< = Less than the detection limit indicated.

00561

Rheponynius 9/618-024
WO-# 940225

Setup #1 Day 10

ASL

RESULTS OF ANALYSIS - Water

File No. E1114

		DAC-HY-23 R	DAC-HY-24 R	Control 1 R	Control 2 R
		94 06 10	94 06 10	94 06 10	94 06 10
Nutrients					
Ammonia Nitrogen	N	0.79	1.06	1.62	1.53
Inorganic Parameters					
Sulphide	S	<0.02	<0.02	<0.02	<0.02

Remarks regarding the analyses appear at the beginning of this report.
Results are expressed as milligrams per litre.
< = Less than the detection limit indicated.

00562

Rhepoxynius 9/018-024 Setup # 1 Day 10
W.O. # 940225

METHODOLOGY

File No. E1114

Samples were analyzed by methods acceptable to the appropriate regulatory agency. Outlines of the methodologies utilized are as follows:

Conventional Parameters in Water

These analyses are carried out in accordance with procedures described in "Standard Methods for the Examination of Water and Wastewater" 18th Ed. published by the American Public Health Association, 1992. Further details are available on request.

End of Report

00563

EVS CONSULTANTS

Amphipod Survival and Emergence Data

Client:	NOAA – Setup #2	**Test Species:**	*Rhepoxynius abronius*
Project #:	9/618–02.4	**Date Initiated:**	June 3, 1994
Work Order:	940225	**Date Terminated:**	June 13, 1994
Test Type:	10–d static marine sediment		
		Number of Test Organisms:	20

Sample ID	Rep	No. Survivors	No. Emerged Days 1–10	No. Failing to Reburrow	Mean Survival (%)	Mean Emergence (#/jar/day)	Reburial (%)
Control 1	A	19	9	1	96.0	0.5	99
	B	20	1	0			
	C	18	7	0			
	D	19	8	0			
	E	20	1	0			
DAC–HY–4T	A	17	8	0	79.0	1.2	97
	B	16	13	0			
	C	15	12	1			
	D	15	14	1			
	E	16	13	0			
DAC–HY–6T	A	18	4	0	87.0	0.8	95
	B	17	12	2			
	C	16	13	1			
	D	18	6	1			
	E	18	4	0			
DAC–HY–7T	A	20	7	2	93.8	0.9	92
	B	20	13	2			
	C[1]	–	–	–			
	D	17	7	1			
	E	18	10	1			
DAC–HY–9T	A	16	17	2	84.0	1.1	94
	B	19	9	0			
	C	16	5	0			
	D	16	15	2			
	E	17	7	1			

1. This replicate (DAC–HY–7T–C) was tipped over on Day 5 of testing and has therefore been removed from statistical analysis.

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for data entry only

Certified

EVS CONSULTANTS

Amphipod Survival and Emergence Data

Client:	NOAA – Setup #2	Test Species:	...nius
Project #:	9/618–02.4	Date Initiate	
Work Order:	940225	Date Termi	
Test Type:	10–d static marine sediment		
		Number of	0

Sample ID	Rep	No. Survivors	No. Emerged Days 1–10	No. Failing to Reburrow	Mean Survival (%)	Mean Emergence (#/jar/day)	Reburial (%)
DAC–HY–10T	A	10	14	0	56.0	0.7	98
	B	12	3	0			
	C	12	2	0			
	D	9	8	0			
	E	13	6	1			
DAC–HY–12T	A	13	12	1	77.0	1.4	97
	B	17	16	1			
	C	15	14	0			
	D	14	16	0			
	E	18	14	0			
DAC–HY–26T	A	15	11	2	81.0	1.5	85
	B	17	13	4			
	C	16	20	2			
	D	19	20	2			
	E	14	10	2			
DAC–HY–27T	A	19	12	3	86.0	1.7	88
	B	15	14	1			
	C	16	37	4			
	D	18	18	1			
	E	18	3	1			
DAC–HY–28T	A	13	6	0	72.0	1.3	92
	B	12	16	1			
	C	19	13	4			
	D	16	18	1			
	E	12	10	0			

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Certified JLC
Aug 17, 1994

EVS CONSULTANTS

Amphipod Survival and Emergence Data

Client: NOAA – Setup #2
Project #: 9/618–02.4
Work Order: 940225
Test Type: 10–d static marine sediment

Test Species: *Rhepoxynius abronius*
Date Initiated: June 3, 1994
Date Terminated: June 13, 1994

Number of Test Organisms: 20

Sample ID	Rep	No. Survivors	No. Emerged Days 1–10	No. Failing to Reburrow	Mean Survival (%)	Mean Emergence (#/jar/day)	Reburial (%)
Control 2	A	17	8	1	93.0	0.6	98
	B	18	9	0			
	C	20	3	0			
	D	18	7	0			
	E	20	1	1			
DAC–HY–1T	A	15	7	1	77.0	0.6	96
	B	15	5	2			
	C	15	7	0			
	D	18	4	1			
	E	14	1	1			
DAC–HY–2T	A	17	9	0	88.0	0.6	91
	B	18	4	0			
	C	16	14	2			
	D	19	5	4			
	E	18	0	2			
DAC–HY–3T	A	17	2	1	86.0	0.3	97
	B	16	1	0			
	C	16	5	1			
	D	18	4	0			
	E	19	2	1			
DAC–HY–5T	A	16	1	0	77.0	0.6	97
	B	15	6	1			
	C	14	5	1			
	D	14	13	0			
	E	18	4	0			

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Dec 17, 1994

EVS CONSULTANTS

Amphipod Survival and Emergence Data

Client:	NOAA – Setup #2	Test Species:	*Rhepoxynius abronius*
Project #:	9/618–02.4	Date Initiated:	June 3, 1994
Work Order:	940225	Date Terminated:	June 13, 1994
Test Type:	10–d static marine sediment		
		Number of Test Organisms:	20

Sample ID	Rep	No. Survivors	No. Emerged Days 1–10	No. Failing to Reburrow	Mean Survival (%)	Mean Emergence (#/jar/day)	Reburial (%)
DAC–HY–8T	A	15	17	1	74.0	0.8	96
	B	15	1	1			
	C	16	3	0			
	D	14	12	1			
	E	14	5	0			
DAC–HY–11T	A	19	1	0	86.0	0.3	100
	B	17	2	0			
	C	13	6	0			
	D	19	2	0			
	E	18	3	0			
DAC–HY–25T	A	16	6	0	87.0	0.9	97
	B	18	5	0			
	C	18	17	1			
	D	18	6	2			
	E	17	13	0			
DAC–CR–2T	A	18	7	1	85.0	0.5	100
	B	20	0	0			
	C[2]	17	5	0			
	D	17	10	0			
	E[3]	14	5	0			
DAC–CR–2AT	A[3]	2	1	0	72.5	0.6	96
	B[3]	17	15	2			
	C[3]	17	8	0			
	D[4]	34	3	1			
	E	17	3	0			

2. This replicate (DAC–CR–2T–C) had a small crab in it.
3. These replicates (DAC–CR–2T–E and DAC–CR–2AT–A,B,C) had several small starfish found in them.
4. This replicate (DAC–CR–2AT–D) appears to have been misseeded with 40 amphipods.
Calculations for this sample (DAC–CR–2AT) have been based on 120 total amphipods.

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EVS CONSULTANTS - AMPHIPOD SEDIMENT TOXICITY TESTS
EMERGENCE, SURVIVAL AND DAY 10 WATER QUALITY

Water Quality Instruments Used

D.O. Meter II-A-19
pH Meter II-A-26
Salinity II-C-11
Temperature Hg Thermometer

Client: N.O.A.A. set up #2
EVS Project No.: 9/618-02.4
EVS W.O. No.: 9*0225
Day 0: June 3, 1994
Day 10: June 13, 1994
Test Species: R. abronius
Source/Collection Date: May 29 1994
West Beach, Whidbey Island, WA

SAMPLE I.D. Control 1

Rep.	Number of Amphipods Emerged From Sediments at Days 1-10										Number Alive at Day 10	Number Failing to Rebury	Water Chemistry at Day 10			
	1	2	3	4	5	6	7	8	9	10			Temp. (°C)	Sal. (ppt)	D.O. (mg/L)	pH
A	0	1	1	0	1	1	1	1	1	2	19	1	15.5	29	8.2	7.8
B	0	0	0	1	0	0	0	0	0	0	20	0	15.5	28	8.0	7.7
C	0	0	0	0	0	0	1	2	2	2	18	0	15.5	29	8.6	7.9
D	0	1	1	0	1	1	1	1	1	1	19	0	15.5	29	8.3	7.9
E	0	0	0	1	0	0	0	0	0	0	20	0	15.5	29	8.4	7.9
Tech'n																

(# dead:# missing) - A(0:1) B(0:0) C(2:0) D(1:0) E(0:0)

SAMPLE I.D. OAC-HY-9T

Rep.	Number of Amphipods Emerged From Sediments at Days 1-10										Number Alive at Day 10	Number Failing to Rebury	Water Chemistry at Day 10			
	1	2	3	4	5	6	7	8	9	10			Temp. (°C)	Sal. (ppt)	D.O. (mg/L)	pH
A	0	1	2	1	0	3	2	2	4	2	16	2	15.5	30	7.4	8.2
B	0	0	1	0	0	2	1	2	1	2	19	0	15.5	31	7.6	8.3
C	0	0	0	0	1	1	0	1	2	0	16	0	15.5	30	7.9	8.0
D	0	0	1	0	2	2	3	1	2	4	16	2	15.5	30	8.0	8.0
E	0	0	2	1	0	1	0	0	0	3	17	1	15.5	31	7.5	8.1
Tech'n																

(# dead:# missing) - A(0:4) B(0:1) C(0:4) D(1:3) E(0:3)

SAMPLE I.D. OAC-HY-7T

Rep.	Number of Amphipods Emerged From Sediments at Days 1-10										Number Alive at Day 10	Number Failing to Rebury	Water Chemistry at Day 10			
	1	2	3	4	5	6	7	8	9	10			Temp. (°C)	Sal. (ppt)	D.O. (mg/L)	pH
A	0	0	0	0	0	2	1	2	1	1	20	2	15.5	30	7.8	8.0
B	0	0	1	2	0	1	1	3	4	1	20	2	15.5	31	8.0	8.0
C	0	1	6	5	X											
D	0	0	1	1	0	1	1	0	1	2	17	1	15.5	31	8.1	8.0
E	0	1	2	0	0	1	1	1	1	3	18	1	15.5	31	8.0	8.0
Tech'n																

(# dead:# missing) - A(0:0) B(0:0) C(1:2) D(1:2) E(0:2)

(1) C. Rep C aborted (tipped over), omitted from statistical analysis.

00568.

EVS CONSULTANTS - AMPHIPOD SEDIMENT TOXICITY TESTS
EMERGENCE, SURVIVAL AND DAY 10 WATER QUALITY

Water Quality Instruments Used

D.O. Meter E-A-19
pH Meter TL-A-26
Salinity II-C-11
Temperature Hg Thermometer

Client: N.O.A.A. setup #2
EVS Project No.: 9/618-02.4
EVS W.O. No.: 940225
Day 0: June 3, 1994
Day 10: June 13, 1994
Test Species: R. abronius
Source/Collection Date: May 27, 1994
West Beach, Whidbey Island WA.

SAMPLE I.D. DAC-HY-12T

Rep.	Number of Amphipods Emerged From Sediments at Days 1-10										Number Alive at Day 10	Number Failing to Rebury	Water Chemistry at Day 10			
	1	2	3	4	5	6	7	8	9	10			Temp. (°C)	Sal. (ppt)	D.O. (mg/L)	pH
A	1	1	2	3	2	0	0	1	2	0	13	1	15.5	30	7.9	7.7
B	0	0	1	2	4	1	1	1	2	4	17	1	15.5	32	7.8	7.8
C	0	2	1	2	4	0	0	0	4	1	15	0	15.5	31	7.8	7.8
D	0	1	2	1	3	2	1	0	4	2	14	0	15.5	31	8.2	7.9
E	0	0	3	1	1	1	3	0	1	4	18	0	15.5	32	7.9	7.7
Tech'n	MA	SM	CEB KLV	MM	MM	DB	MM	MM	MM	DK SM	KLV	KLV	MM	DK	DK/SM	DK/SM

(# dead:# missing) - A(0:7) B(3:0) C(2:3) D(3:3) E(2:0)

SAMPLE I.D. DAC-HY-26T

Rep.	Number of Amphipods Emerged From Sediments at Days 1-10										Number Alive at Day 10	Number Failing to Rebury	Water Chemistry at Day 10			
	1	2	3	4	5	6	7	8	9	10			Temp. (°C)	Sal. (ppt)	D.O. (mg/L)	pH
A	0	0	2	0	1	1	1	0	4	2	15	2	15.5	32	8.4	8.1
B	0	0	1	0	2	2	2	1	3	2	17	4	15.5	32	8.2	8.1
C	0	0	1	0	2	0	3	2	12	0	16	2	15.5	31	8.3	7.9
D	2	0	3	1	1	2	1	2	6	2	19	2	15.5	32	8.2	8.1
E	0	0	0	0	1	1	1	1	4	2	14	2	15.5	31	8.1	8.0
Tech'n	MA	SM	CEB KLV	MM	MM	DB	MM	MM	MM	DK SM	KLV	KLV	MM	DK	DK/SM	DK/SM

(# dead:# missing) - A(1:4) B(0:3) C(0:4) D(0:1) E(0:6)

SAMPLE I.D. OAC-HY-4T

Rep.	Number of Amphipods Emerged From Sediments at Days 1-10										Number Alive at Day 10	Number Failing to Rebury	Water Chemistry at Day 10			
	1	2	3	4	5	6	7	8	9	10			Temp. (°C)	Sal. (ppt)	D.O. (mg/L)	pH
A	0	0	0	0	1	1	2	3	1	0	17	0	15.5	31	8.4	8.0
B	0	0	2	0	1	1	2	1	0	6	16	0	15.5	30	8.1	7.9
C	0	1	1	1	2	1	2	2	2	0	15	1	15.5	31	8.2	7.9
D	0	0	2	1	0	1	0	1	6	3	15	1	15.5	31	8.2	8.0
E	0	0	2	0	0	3	1	0	3	4	16	0	15.5	31	8.3	8.0
Tech'n	MA	SM	CEB KLV	MM	MM	DB	MM	MM	MM	DK SM	KLV	KLV	MM	DK	DK/SM	DK/SM

(# dead:# missing) - A(3:0) B(2:2) C(3:2) D(2:3) E(4:0)

EVS CONSULTANTS - AMPHIPOD SEDIMENT TOXICITY TESTS
EMERGENCE, SURVIVAL AND DAY 10 WATER QUALITY

Water Quality Instruments Used

D.O. Meter II-A-19
pH Meter II-A-26
Salinity II-C-11
Temperature Hg Thermometer

Client: N.O.A.A. Sd. up #2
EVS Project No.: 91618-02.4
EVS W.O. No.: 940225
Day 0: June 3, 1994
Day 10: June 13, 1994
Test Species: R. abronius
Source/Collection Date: May 29, 1994
West Beach, Whidbey Island, WA

SAMPLE I.D. DAC-HY-10T

Rep.	Number of Amphipods Emerged From Sediments at Days 1-10										Number Alive at Day 10	Number Failing to Rebury	Water Chemistry at Day 10			
	1	2	3	4	5	6	7	8	9	10			Temp. (°C)	Sal. (ppt)	D.O. (mg/L)	pH
A	0	0	2	3	0	0	2	1	4	2	10	Ø	15.5	30	8.4	8.3
B	0	0	2	1	0	0	0	0	0	0	12	Ø	15.5	32	8.4	8.2
C	0	0	2	0	0	0	0	0	0	0	12	Ø	15.5	30	8.3	8.4
D	0	0	2	2	0	2	0	1	1	0	9	Ø	15.5	31	8.5	8.2
E	0	0	0	0	0	1	0	0	2	3	13	1	15.5	32	8.4	8.5
Tech'n	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	DK/JM	KLV	KLV	~~15.5~~ DK/JM	DK	DK/JM	DK/JM

(# dead:# missing) - A(3:7) B(Ø:8) C(6:2) D(3:8) E(1:6)

SAMPLE I.D. DAC-HY-28T

Rep.	Number of Amphipods Emerged From Sediments at Days 1-10										Number Alive at Day 10	Number Failing to Rebury	Water Chemistry at Day 10			
	1	2	3	4	5	6	7	8	9	10			Temp. (°C)	Sal. (ppt)	D.O. (mg/L)	pH
A	0	0	0	1	0	1	1	0	2	1	13	0	15.5	31	8.1	8.3
B	0	0	1	0	0	2	3	4	4	2	12	1	15.5	29	8.2	8.1
C	0	0	1	0	2	1	1	1	5	2	19	4	15.5	30	8.4	7.9
D	0	0	2	0	2	4	2	1	4	3	16	1	15.5	29	~~8.4~~ 7.6	7.9
E	0	0	0	0	2	1	2	1	3	1	12	0	15.5	29	8.0	8.1
Tech'n	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	PLJ	PLJ	[illegible]	DK	DK/JM	DK/JM

(# dead:# missing) - A(2:5) B(3:5) C(0:1) D(1:3) E(1:7)

SAMPLE I.D. DAC-HY-27T

Rep.	Number of Amphipods Emerged From Sediments at Days 1-10										Number Alive at Day 10	Number Failing to Rebury	Water Chemistry at Day 10			
	1	2	3	4	5	6	7	8	9	10			Temp. (°C)	Sal. (ppt)	D.O. (mg/L)	pH
A	1	0	0	0	0	1	1	0	7	2	19	3	15.5	31	8.2	7.9
B	0	0	2	1	0	3	2	3	2	1	15	1	15.5	31	8.4	7.9
C	2	1	8	9	7	2	0	2	6	0	16	4	15.5	30	8.4	7.9
D	2	1	2	1	0	3	2	3	3	1	18	1	15.5	31	8.3	7.8
E	1	0	0	0	0	0	0	1	1	0	18	1	15.5	32	8.3	7.8
Tech'n	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	DK	DK/JM	DK/JM

(# dead:# missing) - A(1:0) B(3:2) C(1:~~6~~3) D(2:0) E(2:0)

CAH July 14/94

EVS CONSULTANTS - AMPHIPOD SEDIMENT TOXICITY TESTS
EMERGENCE, SURVIVAL AND DAY 10 WATER QUALITY

Water Quality Instruments Used

D.O. Meter II-A-19
pH Meter II-A-26
Salinity II-C-11
Temperature Hg Thermometer

Client: N.O.A.A. set up #2
EVS Project No.: 9/618-02.4
EVS W.O. No.: 940225
Day 0: June 3, 1994
Day 10: June 13, 1994
Test Species: R. abronius
Source/Collection Date: May 29, 1994
West Beach, Whidbey Island, WA

SAMPLE I.D. DAC-HY-6T

Rep.	Number of Amphipods Emerged From Sediments at Days 1-10										Number Alive at Day 10	Number Failing to Rebury	Water Chemistry at Day 10			
	1	2	3	4	5	6	7	8	9	10			Temp. (°C)	Sal. (ppt)	D.O. (mg/L)	pH
A	0	0	1	0	0	0	2	1	0	0	18	0	15.5	31	8.6	8.1
B	0	0	1	0	2	0	3	2	3	1	17	2	15.5	31	8.0	8.0
C	2	1	2	1	2	2	0	1	2	1	16	1	15.5	31	8.2	8.0
D	0	0	0	1	2	2	1	0	0	0	18	1	15.5	30	8.2	8.0
E	0	0	0	1	0	1	0	0	0	2	18	0	15.5	30	8.6	8.0
Tech'n	KLV	KLV	KLV	KLV	KLV	KLV	KLV	KLV	KLV	KLV	KLV	KLV	KLV	KLV	KLV	KLV

(# dead:# missing) - A(1:1) B(0:3) C(0:4) D(2:0) E(2:0)

SAMPLE I.D. Control 2

Rep.	Number of Amphipods Emerged From Sediments at Days 1-10										Number Alive at Day 10	Number Failing to Rebury	Water Chemistry at Day 10			
	1	2	3	4	5	6	7	8	9	10			Temp. (°C)	Sal. (ppt)	D.O. (mg/L)	pH
A	1	1	1	1	1	0	0	0	1	2	17	1	15.5	29	8.2	7.8
B	0	0	0	0	1	1	2	1	2	2	18	0	15.5	29	8.4	8.0
C	0	0	0	1	1	0	1	0	0	0	20	0	15.5	30	8.0	7.9
D	0	0	3	2	2	0	0	0	0	0	18	0	15.5	30	8.4	7.9
E	0	1	0	0	0	0	0	0	0	0	20	1	15.5	30	8.5	7.9
Tech'n	KLV	KLV	KLV	KLV	KLV	KLV	KLV	KLV	KLV	KLV	KLV	KLV	KLV	KLV	KLV	KLV

(# dead:# missing) - A(3:0) B(2:0) C(0:0) D(1:1) E(0:0)

SAMPLE I.D. DAC-HY-25T

Rep.	Number of Amphipods Emerged From Sediments at Days 1-10										Number Alive at Day 10	Number Failing to Rebury	Water Chemistry at Day 10			
	1	2	3	4	5	6	7	8	9	10			Temp. (°C)	Sal. (ppt)	D.O. (mg/L)	pH
A	0	0	0	0	2	0	1	0	2	1	16	0	15.5	30	7.6	8.2
B	0	1	0	0	0	0	0	0	4	0	18	0	15.5	30	8.2	8.1
C	1	1	0	0	1	1	4	4	2	1	18	1	15.5	29	7.4	7.9
D	0	0	0	0	0	0	1	0	3	2	18	2	15.5	31	7.8	8.2
E	1	0	2	1	1	0	2	1	3	2	17	0	15.5	30	8.0	8.0
Tech'n	KLV	KLV	KLV	KLV	KLV	KLV	KLV	KLV	KLV	KLV	KLV	KLV	KLV	KLV	KLV	KLV

(# dead:# missing) - A(0:4) B(0:2) C(1:1) D(0:2) E(1:2)

EVS CONSULTANTS - AMPHIPOD SEDIMENT TOXICITY TESTS
EMERGENCE, SURVIVAL AND DAY 10 WATER QUALITY

Water Quality Instruments Used

D.O. Meter II-A-19
pH Meter II-A-26
Salinity II-C-11
Temperature Hg Thermometer

Client: N.O.A.A. setup#2
EVS Project No.: 91618-02.4
EVS W.O. No.: 940225
Day 0: June 3, 1994
Day 10: June 13, 1994
Test Species: R. abronius
Source/Collection Date: May 29, 1994
West Beach, Whidbey Island WA

SAMPLE I.D. DAC-HY-11T

Rep.	Number of Amphipods Emerged From Sediments at Days 1-10										Number Alive at Day 10	Number Failing to Rebury	Water Chemistry at Day 10			
	1	2	3	4	5	6	7	8	9	10			Temp. (°C)	Sal. (ppt)	D.O. (mg/L)	pH
A	0	0	1	0	0	0	0	0	0	0	19	Ø	15.5	31	8.5	8.0
B	0	0	1	0	0	0	1	0	0	0	17	Ø	15.5	30	7.7	8.0
C	2	0	0	0	0	1	1	1	1	0	13	Ø	15.5	30	~~8.4~~ 8.9	8.0
D	0	0	0	0	1	0	0 ①	0 ①	1	0	19	KLV ~~1~~ Ø	15.5	31	7.4	8.0
E	0	0	0	0	2	1	0	0	0	0	18	Ø	15.5	31	7.5	8.0
Tech'n	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	KLV	KLV	[illegible]	[illegible]	[illegible]	[illegible]

(# dead:# missing) - A(1:Ø) B(3:Ø) C(5:2) D(1:Ø) E(2:Ø)

SAMPLE I.D. DAC-HY-8T

Rep.	Number of Amphipods Emerged From Sediments at Days 1-10										Number Alive at Day 10	Number Failing to Rebury	Water Chemistry at Day 10			
	1	2	3	4	5	6	7	8	9	10			Temp. (°C)	Sal. (ppt)	D.O. (mg/L)	pH
A	3	2	2	2	2	0	1	2	2	1	15 ②	1	15.5	31	8.2	8.1
B	0	0	0	0	1	0	0	0	0	0	15	1	15.5	32	8.2	8.1
C	1	0	0	0	0	1	0	1	0	0	~~14~~ 16	0	15.5	32	8.4	8.1
D	0	0	0	1	4	3	1	1	2	0	14	1	15.5	31	8.2	8.1
E	0	1	1	1	1	0	0	0	1	0	14	0	15.5	31	8.4	8.1
Tech'n	[illegible]	[illegible]	KLV	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

(# dead:# missing) - A(1:4) B(~~2~~ 2:3) C(4:~~0~~ 0) D(3:3) E(4:2)

SAMPLE I.D. DAC-HY-~~#~~5T

Rep.	Number of Amphipods Emerged From Sediments at Days 1-10										Number Alive at Day 10	Number Failing to Rebury	Water Chemistry at Day 10			
	1	2	3	4	5	6	7	8	9	10			Temp. (°C)	Sal. (ppt)	D.O. (mg/L)	pH
A	0	0	1	0	0	0	0	0	0	0	16	0	15.5	32	8.5	8.0
B	0	0	0	0	0	0	0	0	6	0	15	1	15.5	30	8.3	8.0
C	3	0	0	0	0	0	0	0	1	1	14	1	15.5	31	8.2	7.9
D	0	0	1	~~2~~ 2	2	0	3	3	2	0	14	0	15.5	30	8.0	7.9
E	0	0	0	0	0	1	1	1	0	1	18	0	15.5	30	8.2	8.0
Tech'n	[illegible]	[illegible]	KLV	[illegible]	[illegible]	[illegible]	[illegible]	0	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

(# dead:# missing) - A(2:2) B(1:4) C(0:6) D(0:6) E(0:2)

① cloudy
② very lady parts found.

00572

[illegible] 14/94

EVS CONSULTANTS - AMPHIPOD SEDIMENT TOXICITY TESTS
EMERGENCE, SURVIVAL AND DAY 10 WATER QUALITY

Water Quality Instruments Used

D.O. Meter II-A-19
pH Meter II-A-24
Salinity II-C-11
Temperature Hg Thermometer

Client: N.O.A.A. Set up #2
EVS Project No.: 9/618-02.4
EVS W.O. No.: 940225
Day 0: June 3, 1994
Day 10: June 13, 1994
Test Species: R. abronius
Source/Collection Date: May 29, 1994
West Beach, Whidbey Island WA

SAMPLE I.D. OAC-HY-3T

Rep.	Number of Amphipods Emerged From Sediments at Days 1-10										Number Alive at Day 10	Number Failing to Rebury	Water Chemistry at Day 10			
	1	2	3	4	5	6	7	8	9	10			Temp. (°C)	Sal. (ppt)	D.O. (mg/L)	pH
A	0	0	0	0	0	0	1	1	0	0	17	1	15.5	32	8.2	8.1
B	0	0	0	0	1	0	0	0	0	0	16	0	15.5	32	8.2	8.0
C	0	0	0	0	0	0	0	0	3	2	16	1	15.5	31	8.3	8.0
D	1	0	0	0	1	0	0	0	1	1	18	0	15.5	31	8.4	8.0
E	0	0	0	0	0	1	0	1	0	0	19	1	15.5	31	8.4	8.0
Tech'n																

(# dead:# missing) - A(0 : 2) B(0 : 4) C(2 : 2) D(1 : 1) E(1 : 0)

SAMPLE I.D. OAC-HY-2T

Rep.	Number of Amphipods Emerged From Sediments at Days 1-10										Number Alive at Day 10	Number Failing to Rebury	Water Chemistry at Day 10			
	1	2	3	4	5	6	7	8	9	10			Temp. (°C)	Sal. (ppt)	D.O. (mg/L)	pH
A	0	0	0	1	2	1	1	1	1	1	17	0	15.5	30	8.4	8.2
B	0	0	0	0	1	1	0	1	0	1	18	0	15.5	31	8.4	7.9
C	0	1	4	2	4	0	0	0	3	0	16	2	15.5	31	8.3	8.0
D	0	1	0	1	1	0	0	0	0	2	19	4	15.5	31	8.4	8.0
E	0	0	0	0	0	0	0	0	0	0	17	2	15.5	31	8.3	7.9
Tech'n																

(# dead:# missing) - A(2 : 1) B(1 : 1) C(2 : 2) D(0 : 1) E(1 : 1)

SAMPLE I.D. OAC-HY-1T

Rep.	Number of Amphipods Emerged From Sediments at Days 1-10										Number Alive at Day 10	Number Failing to Rebury	Water Chemistry at Day 10			
	1	2	3	4	5	6	7	8	9	10			Temp. (°C)	Sal. (ppt)	D.O. (mg/L)	pH
A	0	0	3	1	0	0	0	2	1	0	15	1	15.5	31	8.3	7.8
B	0	1	3	1	0	0	0	0	0	0	15	2	15.5	30	8.4	7.8
C	0	0	6	0	2	1	0	2	1	1	15	0	15.5	30	8.4	7.9
D	0	0	1	0	0	0	1	0	1	1	18	1	15.5	32	8.4	7.8
E	0	0	1	0	0	0	0	0	0	0	14	1	15.5	31	8.5	7.9
Tech'n																

(# dead:# missing) - A(1 : 4) B(3 : 2) C(1 : 4) D(1 : 1) E(2 : 4)

00573

July 1994

EVS CONSULTANTS - AMPHIPOD SEDIMENT TOXICITY TESTS
EMERGENCE, SURVIVAL AND DAY 10 WATER QUALITY

Water Quality Instruments Used

D.O. Meter II-A-19
pH Meter II-A-26
Salinity II-C-11
Temperature Hg Thermometer

Client: N.O.A.A. set up #2
EVS Project No.: 9/618-02.4
EVS W.O. No.: 940225
Day 0: June 3, 1994
Day 10: June 13, 1994
Test Species: R. abronius
Source/Collection Date: May 27, 1994
West Beach, Whidbey Island WA

SAMPLE I.D. DAC-CR-2T

Rep.	Number of Amphipods Emerged From Sediments at Days 1-10										Number Alive at Day 10	Number Failing to Rebury	Water Chemistry at Day 10			
	1	2	3	4	5	6	7	8	9	10			Temp. (°C)	Sal. (ppt)	D.O. (mg/L)	pH
A	0	2	4	1	0	0	0	0	0	0	18	1	15.5	30	8.0	7.9
B	0	0	0	0	0	0	0	0	0	0	20	0	15.5	30	8.1	7.9
C	1	1	0	0	0	0	0	0	3	0	17 (1)	0	15.5	31	7.8	8.0
D	0	3	3	2	0	0	0	1	0	1	17	0	15.5	31	8.4	8.0
E	0	2	2	1	0	0	0	0	0	0	14 (2)	0	15.5	32	8.4	7.9
Tech'n	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

(# dead:# missing) - A(0:2) B(0:0) C(0:3) D(0:3) E(0:6)

SAMPLE I.D. DAC-CR-2AT

Rep.	Number of Amphipods Emerged From Sediments at Days 1-10										Number Alive at Day 10	Number Failing to Rebury	Water Chemistry at Day 10			
	1	2	3	4	5	6	7	8	9	10			Temp. (°C)	Sal. (ppt)	D.O. (mg/L)	pH
A	0	0	0	0	1	0	0	0	0	0	2 (3)	0	15.5	31	8.4	8.0
B	3	2	2	2	4	0	0	0	0	2	17 (4)	2	15.5	31	8.4	7.9
C	0	0	1	0	1	1	1	2	1	1	17 (2)	0	15.5	30	8.2	7.9
D	0	0	1	1	0	0	0	1	0	0	34 (5)	1	15.5	31	8.4	7.9
E	0	0	0	0	2	0	0	0	0	1	17	0	15.5	31	8.4	7.9
Tech'n	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

(# dead:# missing) - A(0:18) B(0:3) C(0:3) D(0:6) E(3:0)

SAMPLE I.D. _____

Rep.	Number of Amphipods Emerged From Sediments at Days 1-10										Number Alive at Day 10	Number Failing to Rebury	Water Chemistry at Day 10			
	1	2	3	4	5	6	7	8	9	10			Temp. (°C)	Sal. (ppt)	D.O. (mg/L)	pH
A																
B																
C																
D																
E																
Tech'n																

(# dead:# missing) - A(:) B(:) C(:) D(:) E(:)

(1) a little crab found
(2) three small starfish found
(3) one small starfish found
(5) double seeded

f:\Forms\datasht\amphipod.1

00574 [illegible] July 14/94

E.V.S. CONSULTANTS - AMPHIPOD SEDIMENT BIOASSAYS
DAILY WATER QUALITY CHEMISTRY MONITORING

Page No. 1/1

Water Quality Instruments Used

D.O. Meter II-A-19
pH Meter II-A-26
Salinity II-C-11
Temperature Hg Thermometer

Client: N.O.A.A. Set #2
EVS Project No.: 9/618-02.4
EVS W.O. No.: 940225
Day 0: June 3, 1994
Day 10: June 13th, 1994
Test Species: R. abronius
Source and Collection Date: May 29, 1994
West Beach, Whidbey Island, WA

SAMPLE I.D.	TEMPERATURE (°C)											SALINITY (ppt)											DISSOLVED OXYGEN (mg/L)											pH										
	0	1	2	3	4	5	6	7	8	9	10	0	1	2	3	4	5	6	7	8	9	10	0	1	2	3	4	5	6	7	8	9	10	0	1	2	3	4	5	6	7	8	9	10
Control 1	15.5	16	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	30	27	30	29	31	30	29	29	29	30	28	8.3	7.6	8.-	8.3	7.8	8.0	8.2	8.1	8.2	8.1	8.4	7.8	7.5	7.7	7.6	7.7	7.7	7.8	7.6	7.8	7.7	7.9
OAC-HY-9T	15.5	16	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	30	29	30	29	31	30	30	29	30	31	29	8.3	7.6	8.-	8.2	8.0	7.9	8.1	7.9	8.0	7.8	8.2	7.8	7.6	7.8	7.8	7.9	7.8	8.0	8.1	8.2	8.1	8.2
OAC-HY-7T	15.5	16	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	30	30	30	29	30	31	30	30	30	31	31	8.3	7.6	8.-	8.2	7.9	8.0	8.0	7.9	8.4	7.9	7.8	7.8	7.6	7.8	7.8	7.8	8.0	8.1	8.2	8.1	8.2
OAC-HY-12T	15.5	16	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	30	31	30	29	31	31	30	30	30	31	30	8.2	7.6	7.6	8.2	7.8	7.8	8.1	8.0	8.2	7.7	7.8	7.8	7.7	7.8	7.7	7.8	7.9	8.1	7.9	8.1	7.9	8.1
OAC-HY-26T	15.5	16	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	30	31	30	29	31	31	30	30	30	31	31	8.3	7.6	8.-	8.2	7.8	7.8	8.1	8.0	8.3	8.0	8.1	7.8	7.6	7.8	7.7	7.7	7.7	7.8	7.8	8.0	7.8	7.9
OAC-HY-4T	15.5	16	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	30	30	30	30	31	29	30	30	31	31	31	7.9	7.5	8.-	8.2	7.8	7.9	8.2	8.0	8.2	8.0	8.3	7.9	7.5	7.8	7.7	7.7	7.7	7.9	8.1	8.7	8.2	8.3
OAC-HY-10T	15.5	16	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	30	30	30	30	31	30	31	32	30	31	30	8.2	7.5	7.7	8.3	8.0	8.0	8.1	8.0	8.1	8.2	8.4	8.0	7.6	8.-	7.8	7.8	7.8	7.9	8.1	8.0	8.1	8.2
OAC-HY-28T	15.5	16	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	30	30	30	30	30	30	30	31	31	31	31	8.0	7.6	8.-	8.1	8.0	7.9	8.0	7.7	8.1	7.7	8.1	7.8	7.6	7.7	7.8	7.8	7.6	7.9	7.9	8.3	8.2	8.3
OAC-HY-27T	15.5	16	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	30	30	30	30	30	30	30	30	30	31	31	8.0	7.7	8.1	8.2	7.8	7.8	8.2	8.0	8.2	7.8	8.5	7.8	7.6	7.7	7.8	7.8	7.6	7.9	7.9	8.3	8.2	8.3
OAC-HY-6T	15.5	16	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	30	30	30	30	31	30	30	31	31	31	31	8.3	7.5	8.2	8.2	8.0	8.0	8.0	8.0	7.8	8.1	8.5	7.9	7.6	7.8	7.7	7.7	7.9	8.1	8.0	8.1	8.2	8.1
Technician																																												

Comments/Adjustments Made: ① Salinity meter used: II-E-12 ② All Samples measured at 15.5°C ③ Airline affected
④ used II-A-16 as (Oyster) pH meter since II-A-26 not working

All entries are to be made with black, ball-point pen. Cross out errors with a single line and initial and date corrections. Do not use "White-Out".

7/14/94

00575

AMPHIPOD SEDIMENT BIOASSAYS
DAILY WATER QUALITY CHEMISTRY MONITORING

Water Quality Instruments Used

D.O. Meter II-A-19
pH Meter II-A-26
Salinity II-C-11
Temperature Hg Thermometer

Client: N.O.A.A. Setup #2
EVS Project No.: 91618-02.4
EVS W.O. No.: 940225
Day 0: June 3, 1994
Day 10: June 13, 1994
Test Species: R. abronius
Source and Collection Date: May 29, 1994
West Beach, Whidbey Island, WA.

SAMPLE I.D.	TEMPERATURE (°C)											SALINITY (ppt)											DISSOLVED OXYGEN (mg/L)											pH										
	0	1	2	3	4	5	6	7	8	9	10	0	1	2	3	4	5	6	7	8	9	10	0	1	2	3	4	5	6	7	8	9	10	0	1	2	3	4	5	6	7	8	9	10
Control 2	15.5	16	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	30	31	30	31	30	30	31	29	30	31	29	8.2	7.5	8.-	8.1	7.6	8.0	8.0	8.1	8.2	8.1	8.4	7.8	7.7	7.7	7.8	7.6	7.7	7.8	7.9	7.8	7.8	8.0
OAC-HY-25T	15.5	16	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	30	30	29	31	30	30	31	30	30	31	30	7.4	7.1	7.7	8.0	7.4	6.9	8.0	7.8	8.0	8.2	7.1	7.7	7.5	7.8	7.3	7.1	7.6	8.0	8.0	8.3	8.3	8.4
OAC-HY-11T	15.5	16	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	31	31	30	31	31	31	31	30	31	31	30	8.2	7.4	8.-	8.2	8.0	7.8	8.1	8.2	8.2	8.2	8.2	7.8	7.9	7.8	7.8	7.8	7.8	7.9	8.-	8.0	8.0	8.0
OAC-HY-8T	15.5	16	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	30	30	30	31	31	31	30	31	32	31	31	8.1	7.3	7.2	8.2	7.7	7.8	8.0	8.1	8.1	8.2	8.2	7.9	7.9	7.9	7.9	7.9	7.9	8.1	8.2	8.2	8.1	8.3
OAC-HY-5T	15.5	16	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	30	29	30	31	30	31	30	31	31	31	31	8.2	7.6	8.-	8.3	7.7	7.8	8.2	8.2	8.2	8.1	8.2	7.9	7.9	7.9	7.9	7.8	7.8	8.0	7.9	7.9	7.9	8.0
OAC-HY-3T	15.5	16	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	31	30	30	31	30	31	30	31	31	31	31	8.0	7.4	8.1	8.3	7.8	7.8	8.0	8.2	8.4	7.9	8.2	7.9	7.9	7.8	7.8	7.8	7.8	8.0	8.0	8.2	8.0	7.9
OAC-HY-2T	15.5	16	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	31	31	30	31	31	31	32	31	30	31	31	8.4	7.6	8.2	8.3	7.8	7.8	8.2	8.2	8.4	8.0	8.4	7.8	7.9	7.8	7.7	7.8	7.8	7.8	8.0	8.2	8.0	7.9
OAC-HY-1T	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	30	30	29	31	31	30	31	32	31	31	30	8.3	7.6	7.6	8.2	7.8	8.1	8.2	8.3	8.2	8.4	7.9	7.6	7.8	7.8	7.7	7.6	7.9	7.9	8.1	8.0	8.2	8.2
OAC-CR-2T	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	30	30	30	31	30	31	32	31	32	31	31	7.6	7.5	7.7	8.1	7.8	7.8	8.0	8.1	8.2	8.2	8.2	7.8	7.7	8.-	7.9	7.9	7.8	7.9	7.9	8.0	7.9	7.9
OAC-CR-2AT	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	30	31	30	31	32	32	32	32	32	31	31	8.4	7.6	7.7	8.2	8.0	7.7	8.1	8.2	8.3	7.9	8.4	7.9	7.7	7.9	7.9	7.8	7.6	7.8	7.9	8.0	7.9	7.9
Technician																																												

Comments/Adjustments Made: ① Salinity meter used: II-C-12 9H ② All samples read at 15.5°C ③ possibly not aerating 9H
④ used II-A-16 mg (owner) pH meter since II-A-26 not working

All entries are to be made with black, ball-point pen. Cross out errors with a single line and initial and date corrections. Do not use "White-Out".

Copy July 14 94

00576

SAMPLE I.D. ~~[illegible]~~ Cadminum Ref tox
DATE ~~COLLECTED~~ MADE ~~January 28~~ April 26 /94 lot #: 94-009
TEST DATE/TIME June 3 /94
NO. ORGANISMS/VOLUME 10/1L

EVS CONSULTANTS
ACUTE TOXICITY TEST DATA

PROJECT NAME NOAA #2
EVS PROJECT NO. 9168-02.4
WORK ORDER NO. 940225
TEST SPECIES Rhepoxinius abronius
SOURCE & BATCH Whidbey Island, May 29/94 West Beach, WA

CONC'N (mg/L) Cd.	PERCENT SURVIVAL (1 to 96 hours)							DISSOLVED OXYGEN (mg/L)					TEMPERATURE (°C)					pH					SALINITY (ppt)	
	1	2	4	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	96
3.2				100	100	10	0	8.2	7.5	7.8	8.9	8.0	16	15.5	15.5	15.5	15.5	7.7	7.7	7.8	7.8	7.8	29	~~29~~ 30
1.8				100	100*	~~100~~ 90	10	8.2	7.7	8.0	8.8	8.0	16	15.5	15.5	15.5	15.5	7.8	7.7	7.9	7.8	7.8	29	31
1.0				100	100*	~~90~~ 100	5 of 10 dead	8.2	7.9	8.0	9.0	8.0	16	15.5	15.5	15.5	15.5	7.7	7.8	7.9	7.9	7.8	29	31
0.56				100	100*	100	80	8.2	7.6	7.9	9.0	7.8	16	15.5	15.5	15.5	15.5	7.7	7.7	7.8	7.8	7.8	29	31
0.32				100	100	90	90	8.2	7.7	7.9	9.0	7.8	16	15.5	15.5	15.5	15.5	7.7	7.7	7.8	7.9	7.8	29	30
0.18				100	100	100	90	8.2	7.7	8.0	9.0	8.0	16	15.5	15.5	15.5	15.5	7.7	7.7	7.9	7.8	7.8	29	30
0.10				100	100	100	90	8.2	7.4	7.9	8.8	8.0	16	15.5	15.5	15.5	15.5	7.7	7.7	7.8	7.8	7.8	29	30
Control				100	100	100	100	8.2	7.6	7.9	8.7	8.0	16	15.5	15.5	15.5	15.5	7.7	7.7	7.9	7.8	7.8	29	29
Technician				[illegible]	[illegible]	KLV	PLD	[illegible]	EJT/LS	EJT/LS	CEB/[illegible]	PLD	[illegible]	EJT/LS	[illegible]	[illegible]	[illegible]	[illegible]	EJT/LS	EJT/LS	CEB	PLD	[illegible]	PLD

SAMPLE DESCRIPTION * 100% survival, however 11 animals seeded
COMMENTS

TEST SET UP BY: CEB, [illegible]
DATA VERIFIED BY: [illegible] Crane
DATE VERIFIED: Aug 12, 1994

EVS ENVIRONMENT CONSULTANTS

LC50:STEPHEN IBM/AT VERS 1.0

FILE: 9/618-02.4 940225 NOAA-Setup #2

TEST: Reference Toxicant
SPECIES: Rhepoxynius abronius
CHEMICAL: Cadmium
CARRIER: Seawater

DATE: June 3, 1994
DURATION: 96 hr
CARRIER CONC: 30 ppt

Sample: Reference Toxicant

Conc	Number exposed	Number dead	Percent dead	Binomial prob(percent)
3.20	10	10	100.0	0.0977
1.80	10	9	90.0	1.0742
1.00	11	5	45.5	50.0000
0.56	10	2	20.0	5.4687
0.32	10	1	10.0	1.0742
0.18	10	1	10.0	1.0742
0.10	10	1	10.0	1.0742

The binom test shows that 0.320 and 1.800 can be used as statistically sound at 95 conf since the actual conf level associated with these limits is 97.852

An approx LC50 is 1.056 mg/L Cd

------RESULTS USING THE MOVING AVERAGE METHOD----------

span	g	lc50	95% conf limits	
5	0.083877	0.857	0.615	1.287
4	0.167754	0.909	0.633	1.254
3	0.269420	0.952	0.682	1.574
2	0.370773	0.990	0.671	1.441
1	0.849440	1.056	0.062	1.389

Probit warning:no convergence in 25 iterations

00578

Certified QC
Nov. 12, 1994

1988 Triumph Street, Vancouver, B.C., Canada V5L 1K5

analytical
service
laboratories
ltd.

FAX: (604) 253-6700 TEL: (604) 253-4188

Rheokinus 9/618-02.4
D.O. # 940225

Setup II 2 Day 0

CHEMICAL ANALYSIS REPORT

Date: June 13, 1994

ASL File No. D9893

Report On: 9/618-02.4 Water Analysis

Report To: **EVS Environment Consultants**
195 Pemberton Avenue
North Vancouver, BC
V7P 2R4

Received: June 6, 1994

ASL ANALYTICAL SERVICE LABORATORIES LTD.
per:

Heather A. Ross, B.Sc.
Project Chemist

Katherine Thomas, B.Sc.
Project Chemist

00579

Rheopectinus 9/618-02.4 Setup #2 Day 0
W.O. # 940225

RESULTS OF ANALYSIS - Water

File No. D9893

		DAC-HY-4T	DAC-HY-4TN	DAC-HY-5T	DAC-HY-5TN	DAC-HY-6T
		94 06 02	94 06 02	94 06 02	94 06 02	94 06 02
Nutrients						
Ammonia Nitrogen	N	0.690	0.860	0.930	0.840	0.580
Inorganic Parameters						
Sulphide	S	<0.02	<0.02	<0.02	<0.02	<0.02

Results are expressed as milligrams per litre.
< = Less than the detection limit indicated.

00500

Rheopectinus 9/618-024 Setup #2 Day 0
W.O.# 940225

RESULTS OF ANALYSIS - Water

File No. D9893

		DAC-HY-6TN	DAC-HY-7T	DAC-HY-7TN	DAC-HY-8T	DAC-HY-8TN
		94 06 02	94 06 02	94 06 02	94 06 02	94 06 02
Nutrients						
Ammonia Nitrogen	N	0.570	0.560	0.670	0.670	0.680
Inorganic Parameters						
Sulphide	S	<0.02	<0.02	<0.02	<0.02	<0.02

Results are expressed as milligrams per litre.
< = Less than the detection limit indicated.

00581

Rhepoxynius 9/618-02.4 Setup #2 Day 0
W.O. # 940225

RESULTS OF ANALYSIS - Water

File No. D9893

		DAC-HY-9T	DAC-HY-9TN	DAC-HY-10T	DAC-HY-10TN	DAC-HY-11T
		94 06 02	94 06 02	94 06 02	94 06 02	94 06 02
Nutrients						
Ammonia Nitrogen	N	0.680	0.730	0.710	0.720	0.580
Inorganic Parameters						
Sulphide	S	<0.02	<0.02	<0.02	<0.02	0.02

Results are expressed as milligrams per litre.
< = Less than the detection limit indicated.

00582

Rhepoxynius 9/618-02.4 W.O.# 940225

Setup #2 Day 0

RESULTS OF ANALYSIS - Water

File No. D9893

		DAC-HY-11TN	DAC-HY-12T	DAC-HY-12TN	DAC-HY-25T	DAC-HY-25TN
		94 06 02	94 06 02	94 06 02	94 06 02	94 06 02
Nutrients						
Ammonia Nitrogen	N	0.640	0.380	0.480	0.260	1.00
Inorganic Parameters						
Sulphide	S	<0.02	<0.02	<0.02	<0.02	<0.02

Results are expressed as milligrams per litre.
< = Less than the detection limit indicated.

00583

Rhizoxynus 9/618-02.4 Setup # 2 Day 0
W.O. # 940225

RESULTS OF ANALYSIS - Water

File No. D9893

		DAC-HY-26T	DAC-HY-26TN	DAC-HY-27T	DAC-HY-27TN	DAC-HY-28T
		94 06 02	94 06 02	94 06 02	94 06 02	94 06 02
Nutrients						
Ammonia Nitrogen	N	0.590	0.750	0.600	0.700	0.740
Inorganic Parameters						
Sulphide	S	<0.02	0.03	<0.02	<0.02	<0.02

Results are expressed as milligrams per litre.
< = Less than the detection limit indicated.

00584

Rhepoxynius 9/618-024
W.O. # 940225

Setup #2 Day 0

RESULTS OF ANALYSIS - Water

File No. D9893

		DAC-HY-28TN	Control 1	Control 1N	Control 2	Control 2N
		94 06 02	94 06 02	94 06 02	94 06 02	94 06 02
Nutrients						
Ammonia Nitrogen	N	0.850	0.260	0.280	0.240	0.230
Inorganic Parameters						
Sulphide	S	<0.02	<0.02	<0.02	<0.02	<0.02

Results are expressed as milligrams per litre.
< = Less than the detection limit indicated.

00585

Chepoxynus 9/618-02.4
W.O. # 940225

Setup #2 Day 0

RESULTS OF ANALYSIS - Water

File No. D9893

		DAC-HY-3T	DAC-HY-3TN	DAC-HY-2T	DAC-HY-2TN	DAC-HY-1T
		94 06 02	94 06 02	94 06 02	94 06 02	94 06 02
Nutrients						
Ammonia Nitrogen	N	0.480	0.570	0.260	0.190	0.130
Inorganic Parameters						
Sulphide	S	<0.02	<0.02	<0.02	<0.02	<0.02

Results are expressed as milligrams per litre.
< = Less than the detection limit indicated.

00586

Rhepoxynius 9/618-02.4 W.O. # 940225

ASL Setup #2 Day 0

RESULTS OF ANALYSIS - Water

File No. D9893

		DAC-HY-1TN	DAC-CR-2T	DAC-CR-2TN	DAC-CR-2AT	DAC-CR-2ATN
		94 06 02	94 06 02	94 06 02	94 06 02	94 06 02
Nutrients						
Ammonia Nitrogen	N	0.220	0.180	0.420	0.096	0.250
Inorganic Parameters						
Sulphide	S	<0.02	0.03	0.04	0.03	0.03

Results are expressed as milligrams per litre.
< = Less than the detection limit indicated.

00387

Dilepoxymius 9/6/8-02:4 Setup #2 Day 0
W.O # 940225

METHODOLOGY

File No. D9893

Samples were analyzed by methods acceptable to the appropriate regulatory agency. Outlines of the methodologies utilized are as follows:

Conventional Parameters in Water

These analyses are carried out in accordance with procedures described in "Standard Methods for the Examination of Water and Wastewater" 18th Ed. published by the American Public Health Association, 1992. Further details are available on request.

End of Report

00588

1988 Triumph Street, Vancouver, B.C., Canada V5L 1K5

analytical service laboratories ltd.

FAX: (604) 253-6700 TEL: (604) 253-4188

Rhegozynuis 9/618-02.4
W.O. # 940225

Setup # 2 Day 10

JUN 27 1994

CHEMICAL ANALYSIS REPORT

Date:	June 20, 1994
ASL File No.	E1142
Report On:	9/618-02.4 Water Analysis
Report To:	**EVS Environment Consultants** 195 Pemberton Avenue North Vancouver, BC V7P 2R4
Attention:	**Ms. Kathie Vilkas**
Received:	June 13, 1994

ASL ANALYTICAL SERVICE LABORATORIES LTD.
per:

Heather A. Ross, B.Sc.
Project Chemist

Katherine Thomas, B.Sc.
Project Chemist

00589

Rhepoxynius 91018-02.4
WO# 940225

Setup #2 Day 10

REMARKS

File No. E1142

As indicated on the sample submission form, these samples are identified as "Day 10 Teardown (June 13, 1994), Rhipox".

00590

Khepokynius 9/618-02.4
WO # 940225

Setup #2 Day 10

ASL

RESULTS OF ANALYSIS - Water

File No. E1142

		Control #1 R	DAC-HY-9T R	DAC-HY-7T R	DAC-HY-12T R	DAC-HY-26T R
		94 06 13	94 06 13	94 06 13	94 06 13	94 06 13
Nutrients						
Ammonia Nitrogen	N	1.62	1.19	1.48	0.91	1.96
Inorganic Parameters						
Sulphide S		<0.02	<0.02	<0.02	<0.02	<0.02

Remarks regarding the analyses appear at the beginning of this report.
Results are expressed as milligrams per litre.
< = Less than the detection limit indicated.

00591

Khepoxynius 9/618-02.4
O.O. # 940225

Setup # 2 Day 10

ASL

RESULTS OF ANALYSIS - Water

File No. E1142

		DAC-HY-4T R	DAC-HY-10T R	DAC-HY-28T R	DAC-HY-27T R	DAC-HY-6T R
		94 06 13	94 06 13	94 06 13	94 06 13	94 06 13
Nutrients						
Ammonia Nitrogen	N	1.22	1.45	2.43	2.28	0.97
Inorganic Parameters						
Sulphide	S	<0.02	<0.02	<0.02	<0.02	<0.02

Remarks regarding the analyses appear at the beginning of this report.
Results are expressed as milligrams per litre.
< = Less than the detection limit indicated.

00592

Khepoxynuus 9/618-02.4
W.O.# 940225

Setup #2 Day 10

RESULTS OF ANALYSIS - Water

File No. E1142

		DAC-HY-25T R	Control 2 R	DAC-HY-11T R	DAC-HY-8T R	DAC-HY-5T R
		94 06 13	94 06 13	94 06 13	94 06 13	94 06 13
Nutrients						
Ammonia Nitrogen	N	2.61	1.89	0.23	1.65	1.16
Inorganic Parameters						
Sulphide S		<0.02	<0.02	0.02	<0.02	<0.02

Remarks regarding the analyses appear at the beginning of this report.
Results are expressed as milligrams per litre.
< = Less than the detection limit indicated.

00593

Khepoxynus 9/618-02.4
W.O. # 940225

Detgs #2 Day 10

ASL

RESULTS OF ANALYSIS - Water

File No. E1142

		DAC-HY-2T R	DAC-HY-3T R	DAC-HY-1T R	DAC-CR-2T R	DAC-CR-2AT R
		94 06 13	94 06 13	94 06 13	94 06 13	94 06 13
Nutrients						
Ammonia Nitrogen	N	0.22	2.46	0.10	1.66	0.07
Inorganic Parameters						
Sulphide	S	<0.02	<0.02	<0.02	<0.02	<0.02

Remarks regarding the analyses appear at the beginning of this report.
Results are expressed as milligrams per litre.
< = Less than the detection limit indicated.

00594

Rhegozynuis 9/618-024
W.O.# 940225

Setup #2 Day 10

METHODOLOGY

File No. E1142

Samples were analyzed by methods acceptable to the appropriate regulatory agency. Outlines of the methodologies utilized are as follows:

Conventional Parameters in Water

These analyses are carried out in accordance with procedures described in "Standard Methods for the Examination of Water and Wastewater" 18th Ed. published by the American Public Health Association, 1992. Further details are available on request.

End of Report

00595

APPENDIX B
Juvenile Polychaete Bioassay
RAW DATA

PRIVILAGED ATTORNEY WORK PRODUCT - FOIA EXEMPT - DO NOT DISCLOSE

EVS CONSULTANTS

Dry Weight Data

Client:	NOAA – Setup #1	**Test Species:**	*Neanthes arenaceodentata*
Project #:	9/518–02.4	**Date Initiated:**	May 31, 1994
Work Order:	940225	**Date Terminated:**	June 20, 1994
Test Type:	20–d sediment toxicity test	**Number of Animals/rep:**	5

Sample ID	Rep	Survivors	# of Animals Weighed	Pan Weight (g)	Final Weight (pan + biomass) (g)	Total Biomass (mg)	Individual Biomass (mg)	Mean Survival (%)	Mean Individual Biomass (mg)
Initial Dry Weight N–A	A	5	5	0.9690	0.9694	0.40	0.08	100.00	0.15
Initial Dry Weight N–B	B	5	5	0.9652	0.9658	0.60	0.12		
Initial Dry Weight N–C	C	5	5	0.9686	0.9699	1.30	0.26		

00597

data entry only

Certified for JLC
Aug. 15, 1994

EVS CONSULTANTS

Dry Weight Data

Client:	NOAA – Setup #1	Test Species:	*Neanthes arenaceodentata*
Project #:	9618–02.4	Date Initiated:	May 31, 1994
Work Order:	940225	Date Terminated:	June 20, 1994
Test Type:	20–d sediment toxicity test		
		Number of Animals/rep:	5

Sample ID	Rep	Survivors	# of Animals Weighed	Pan Weight (g)	Final Weight (pan + biomass) (g)	Total Biomass (mg)	Individual Biomass (mg)	Mean Survival (%)	Mean Individual Biomass (mg)
Control 1	A	5	5	0.9980	1.0626	64.60	12.92	100.00	10.94
	B	5	5	0.9966	1.0490	52.40	10.48		
	C	5	5	0.9961	1.0503	54.20	10.84		
	D	5	5	0.9942	1.0568	62.60	12.52		
	E	5	5	0.9941	1.0338	39.70	7.94		
DAC–HY–14T	A	5	5	0.9874	1.0431	55.70	11.14	100.00	12.64
	B	5	5	0.9905	1.0495	59.00	11.80		
	C	5	5	0.9876	1.0575	69.90	13.98		
	D	5	5	0.9861	1.0493	63.20	12.64		
	E	5	5	0.9860	1.0542	68.20	13.64		
DAC–HY–15T	A	4	4	0.9888	1.0483	59.50	14.88	92.00	12.12
	B	4	4	0.9839	1.0307	46.80	11.70		
	C	5	5	0.9868	1.0338	47.00	9.40		
	D	5	5	0.9828	1.0566	73.80	14.76		
	E	5	5	0.9865	1.0358	49.30	9.86		
DAC–HY–17T	A	5	5	0.9937	1.0410	47.30	9.46	100.00	10.60
	B	5	5	0.9974	1.0493	51.90	10.38		
	C	5	5	0.9954	1.0514	56.00	11.20		
	D	5	5	0.9981	1.0518	53.70	10.74		
	E	5	5	1.0016	1.0578	56.20	11.24		
DAC–HY–19T	A	5	5	0.9942	1.0446	50.40	10.08	100.00	11.78
	B	5	5	0.9966	1.0634	66.80	13.36		
	C	5	5	0.9942	1.0607	66.50	13.30		
	D	5	5	0.9932	1.0511	57.90	11.58		
	E	5	5	0.9978	1.0508	53.00	10.60		

00598

F:\user\jean\961802\940225n.wk1

Certified for data entry only

EVS CONSULTANTS

Dry Weight Data

Client: NOAA – Setup #1
Project #: 9618–02.4
Work Order: 940225
Test Type: 20–d sediment toxicity test

Test Species: *Neanthes arenaceodentata*
Date Initiated: May 31, 1994
Date Terminated: June 20, 1994

Number of Animals/rep: 5

Sample ID	Rep	Survivors	# of Animals Weighed	Pan Weight (g)	Final Weight (pan + biomass) (g)	Total Biomass (mg)	Individual Biomass (mg)	Mean Survival (%)	Mean Individual Biomass (mg)
DAC–HY–20T	A	5	5	0.9917	1.0341	42.40	8.48	100.00	10.62
	B	5	5	0.9848	1.0328	48.00	9.60		
	C	5	5	0.9932	1.0396	46.40	9.28		
	D	5	5	0.9921	1.0593	67.20	13.44		
	E	5	5	0.9970	1.0586	61.60	12.32		
DAC–HY–21T	A[1]	6	6	0.9986	1.0751	76.50	12.75	100.00	13.07
	B	5	5	0.9953	1.0567	61.40	12.28		
	C	5	5	0.9905	1.0568	66.30	13.26		
	D	5	5	0.9912	1.0638	72.60	14.52		
	E[2]	5	5	0.9898	1.0524	62.60	12.52		
DAC–HY–22T	A	5	5	0.9893	1.0185	29.20	5.84	96.00	10.89
	B	4	4	0.9903	1.0347	44.40	11.10		
	C	5	5	0.9875	1.0440	56.50	11.30		
	D	5	5	0.9878	1.0693	81.50	16.30		
	E	5	5	0.9878	1.0373	49.50	9.90		
DAC–HY–23T	A	5	5	0.9954	1.0588	63.40	12.68	100.00	11.49
	B	5	5	0.9940	1.0456	51.60	10.32		
	C	5	5	0.9857	1.0475	61.80	12.36		
	D	5	5	0.9857	1.0380	52.30	10.46		
	E	5	5	0.9930	1.0511	58.10	11.62		
R & D Control	A	5	5	0.9954	1.0516	56.20	11.24	100.00	12.15
	B	5	5	0.9938	1.0586	64.80	12.96		
	C	5	5	0.9976	1.0633	65.70	13.14		
	D	5	5	0.9955	1.0531	57.60	11.52		
	E	5	5	0.9964	1.0558	59.40	11.88		

1. This replicate (DAC–HY–21T–A) was misseeded with 6 organisms.
2. In the following replicates, a small portion of one organism was missing (DAC–HY–21T–E).

00599

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certified for data entry only
Aug 17, 1994

EVS CONSULTANTS

Dry Weight Data

Client:	NOAA – Setup #1	Test Species:	*Neanthes arenaceodentata*
Project #:	9/618–02.4	Date Initiated:	May 31, 1994
Work Order:	940225	Date Terminated:	June 20, 1994
Test Type:	20–d sediment toxicity test		
		Number of Animals/rep:	5

Sample ID	Rep	Survivors	# of Animals Weighed	Pan Weight (g)	Final Weight (pan + biomass) (g)	Total Biomass (mg)	Individual Biomass (mg)	Mean Survival (%)	Mean Individual Biomass (mg)
Control 2	A	5	5	0.9863	1.0451	58.80	11.76	100.00	11.65
	B	5	5	0.9883	1.0285	40.20	8.04		
	C	5	5	0.9885	1.0596	71.10	14.22		
	D	5	5	0.9853	1.0323	47.00	9.40		
	E	5	5	0.9858	1.0600	74.20	14.84		
DAC–HY–13T	A	5	5	0.9930	1.0710	78.00	15.60	100.00	12.64
	B	5	5	0.9940	1.0617	67.70	13.54		
	C[3]	5	5	0.9937	1.0544	60.70	12.14		
	D	5	5	0.9866	1.0328	46.20	9.24		
	E	5	5	0.9856	1.0489	63.30	12.66		
DAC–HY–16T	A	5	5	1.0066	1.0520	45.40	9.08	100.00	9.40
	B	5	5	1.0085	1.0435	35.00	7.00		
	C	5	5	1.0062	1.0658	59.60	11.92		
	D	5	5	1.0052	1.0436	38.40	7.68		
	E	5	5	0.9997	1.0563	56.60	11.32		
DAC–HY–18T	A	4	4	1.0025	1.0600	57.50	14.38	88.00	11.30
	B	5	5	1.0018	1.0560	54.20	10.84		
	C	5	5	1.0021	1.0538	51.70	10.34		
	D	5	5	1.0033	1.0641	60.80	12.16		
	E	3	3	1.0030	1.0293	26.30	8.77		
DAC–HY–24T	A	5	5	0.9890	1.0664	77.40	15.48	100.00	14.18
	B	5	5	0.9868	1.0484	61.60	12.32		
	C	5	5	0.9908	1.0618	71.00	14.20		
	D	5	5	0.9838	1.0578	74.00	14.80		
	E	5	5	0.9892	1.0596	70.40	14.08		

3. In the following replicates, a small portion of one organism was missing (DAC–HY–13T–C).

00000

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Certified for data entry only: [illegible] Aug 17, 1994

7/6

EVS CONSULTANTS
SEDIMENT TOXICITY TESTS - SURVIVAL AND FINAL WATER QUALITY DATA

Client NOAA
EVS Project Number 9/618-024
EVS W.O. No. 94-0225

Start Date (Day 0) May 31/94
End Date June 20/94
Test Type/Species Ampelisca - (20 day)

Subset #1

Sample I.D.	Rep.	Pan No.	No. Alive	No. Dead	Total Recovered	No. Missing	Tech. Init.		pH	Dissolved Oxygen (mg/L)	Temp. (°C)	Cond. (µmhos/cm) ☐ Salinity (ppt) ☑
Control Sed #1	A	N1	5	0	5	0			7.8	7.3	20	29
	B	N2	5	0	5	0			7.9	7.5	20	29
	C	N3	5	0	5	0			7.8	7.3	20	28
	D	N4	5	0	5	0			7.7	7.3	20	28
	E	N5	5	0	5	0			7.9	7.3	20	28
Control Sed #2	A	N6	5	0	5	0			7.9	7.4	20	27
	B	N7	5	0	5	0			7.9	7.4	20	27
	C	N8	5	0	5	0			7.9	7.4	20	28
	D	N9	5	0	5	0			7.9	7.5	20	28
	E	N10	5	0	5	0			7.9	7.4	20	28
DAC - Hy ~~10%~~ 20%	A	N11	5	0	5	0			7.7	6.6	20	31
	B	N12	5	0	5	0			7.7	7.3	20	32
	C	N13	5	0	5	0			7.9	7.2	20	31
	D	N14	5	0	5	0			7.9	6.8	20	30
	E	N15	5	0	5	0			7.6	6.6	20	31
						Technician's Initials			MJ	MJ	TF	MJ

Water Quality Instruments: pH II-A-16 #9 D.O. II-A-3 Cond./Salinity II-C-12

ratified DLC

0801

7/6

03602

EVS CONSULTANTS
SEDIMENT TOXICITY TESTS - SURVIVAL AND FINAL WATER QUALITY DATA

Client NOAA
EVS Project Number 91618-02-04
EVS W.O. No. 940225

Start Date (Day 0) May 31/94
End Date June 20/94
Test Type/Species Mandlin. (20 day)

3 dup #1

Sample I.D.	Rep.	Pan No.	No. Alive	No. Dead	Total Recovered	No. Missing	Tech. Init.	pH	Dissolved Oxygen (mg/L)	Temp. (°C)	Cond. (µmhos/cm) ☐ Salinity (ppt) ☑
SAc-Hy-17T	A	16	5	0	5	0	3	7.6	6.8	20	30
	B	17	5	0	5	0	3	7.8	7.0	20	30
	C	18	5	0	5	0	3	7.8	7.1	20	29
	D	19	5	0	5 ①	0	3	7.4	7.5	20	29
	E	20	5	0	5	0	3	7.8	7.5	20	31
DAC-Hy-23T	A	21	5	0	5	0	3	7.5	6.6	20	30
	B	22	5	0	5	0	3	7.8	7.0	20	31
	C	23	5	0	5	0	3	7.6	6.9	20	30
	D	24	5	0	5	0	3	7.7	7.2	20	30
	E	25	5	0	5	0	3	7.7	7.4	20	30
DAC-Hy-22T	A	26	5	0	5	0	PM	7.7	6.4	20	29
	B	27	4	0	4	1	PM	7.8	7.3	20	29
	C	28	5	0	5	0	PM	7.9	7.2	20	30
	D	29	5	0	5	0	PM	7.8	7.3	20	30
	E	30	5	0	5	0	PM	7.9	7.4	20	31
							Technician's Initials	PM 6/15	PM 6/16	PM	PM

Water Quality Instruments: pH II-A-16 #9 D.O. II-A-3 Cond/Salinity II-C-12

SAC-Hy-17T

3/6

00603

EVS CONSULTANTS
SEDIMENT TOXICITY TESTS - SURVIVAL AND FINAL WATER QUALITY DATA

Client NOAA
EVS Project Number 9/618-0204
EVS W.O. No. 940225

Start Date (Day 0) May 31/94
End Date June 20/94
Test Type/Species Neanthes (20 day)

Subsp #1

Sample I.D.	Rep.	Pan No.	No. Alive	No. Dead	Total Recovered	No. Missing	Tech. Init.	pH	Dissolved Oxygen (mg/L)	Temp. (°C)	Cond. (µmhos/cm) ☐ Salinity (ppt) ☑
DAC-Hy 4T	A	31	5	0	5	0	3	7.5	6.7	20	30
	B	32	5	0	5	0	3	7.7	7.1	20	30
	C	33	5	0	5 ①	0	3	7.8	7.2	20	31
	D	34	5	0	5	0	3	7.7	7.2	20	31
	E	35	5	0	5 ①	0	3	7.7	7.0	20	31
DAC Hy-15T	A	36	4	0	4	1	3	7.4	6.5	20	30
	B	37	4	0	4 ②	1	3	7.6	6.5	20	31
	C	38	5	0	NS 5 ~~0~~	0	3	7.6	6.5	20	30
	D	39	5	0	NS 5 ~~0~~	0	3	7.8	7.3	20	31
	E	40	5	0	NS 5 ~~0~~	0	3	7.5	6.4	20	30
DAC Hy 19T	A	41	5	0	5	0	3	7.8	7.0	20	30
	B	42	5	0	5	0	3	7.8	7.2	20	31
	C	43	5	0	5	0	3	7.7	6.4	20	30
	D	44	5	0	5	0	3	7.9	6.8	20	31
	E	45	5	0	5	0	3	7.9	7.4	20	30
							Technician's Initials	[illegible]	[illegible]	[illegible]	[illegible]

N-37 (DAC-Hy-15T-B) - portion of tail in pan with worm NO Missing biomass [illegible]

Water Quality Instruments: pH II-A-16 #9 D.O. II-A-3 Cond./Salinity II-C-12

(N33+35 DAC-Hy-4T-E) ① a small piece missing from two neanthes [illegible] - end of tail Fipped under end legge [illegible]

4/6

00004

EVS CONSULTANTS
SEDIMENT TOXICITY TESTS - SURVIVAL AND FINAL WATER QUALITY DATA

Client NOAA
EVS Project Number 9/618-02-04
EVS W.O. No. 940225

Start Date (Day 0) May 31/94
End Date June 20/94
Test Type/Species Neanthes (20 day)

Setup #1

Sample I.D.	Rep.	Pan No.	No. Alive	No. Dead	Total Recovered	No. Missing	Tech. Init.	pH	Dissolved Oxygen (mg/L)	Temp. (°C)	Cond. (µmhos/cm) ☐ Salinity (ppt) ☑
~~A~~ D Control	A	46	5	0	5	0	S	7.9	7.4	20	27
	B	47	5	0	5	0	S	7.4	7.4	20	27
	C	48	5	0	5	0	S	7.8	7.4	20	27
	D	49	5	0	5	0	S	7.7	7.0	20	27
	E	50	5	0	5	0	S	8.0	7.2	20	28
							Technician's Initials	S	S	S	S

Water Quality Instruments: pH TK-A-16 #9 D.O. TK-A-3 Cond./Salinity TK-C-12

Control DLC

5/6

00605

EVS CONSULTANTS
SEDIMENT TOXICITY TESTS - SURVIVAL AND FINAL WATER QUALITY DATA

Client NOAA
EVS Project Number 9/618-02-4
EVS W.O. No. 940225

Start Date (Day 0) May 31/94
End Date June 20/94
Test Type/Species Neanthes (20 day)

Set up #1

Sample I.D.	Rep.	Pan No.	No. Alive	No. Dead	Total Recovered	No. Missing	Tech. Init.	pH	Dissolved Oxygen (mg/L)	Temp. (°C)	Cond. (µmhos/cm) ☐ Salinity (ppt) ☑
DAC-Hy-24T	A	61 ~~46~~	5	0	5	0	[illegible]	7.7	7.1	20	31
	B	62 ~~47~~ ~~46~~	5	0	5	0	[illegible]	7.8	6.8	20	29
	C	63 ~~48~~	5	0	5	0	[illegible]	7.7	6.8	20	29
	D	64 ~~49~~	5	0	5	0	[illegible]	7.6	6.6	20	29
	E	65 ~~50~~	5	0	5	0	[illegible]	7.7	6.7	20	30
DAC-Hy-21T	A	51	PLS ~~5~~ 6	0	~~5~~ PLS 6	0	[illegible]	8.1	7.0	20	30
	B	52	5	0	5	0	[illegible]	8.2	7.1	20	30
	C	53	5	0	5 ①	0	[illegible]	8.0	7.0	20	30
	D	54	5	0	5	0	[illegible]	7.9	6.5	20	29
	E	55	5	0	5 ①	0	[illegible]	8.1	7.0	20	30
DAC-Hy-13T	A	56	5	0	5	0	[illegible]	7.9	6.8	20	30
	B	57	5	0	5	0	[illegible]	7.9	7.0	20	30
	C	58	5	0	5 ①	0	[illegible]	7.9	7.1	20	31
	D	59	5	0	5 ①	0	[illegible]	7.9	7.0	20	33
	E	60	5	0	5 ①	0	[illegible]	7.9	7.1	20	32
							Technician's Initials	[illegible]	[illegible]	[illegible]	[illegible]

DAC Hy-21T C-N53 - Recov in Pan
E-N55 - Confirmed

Water Quality Instruments: pH II-A-16 #9 D.O. II-A-3 Cond./Salinity II-C-12

DAC-HY-21T A Missed with 6 animals instead of 5. JYS.

DAC Hy-13T-C-N58-Confirmed
[illegible] ① a small portion of one [illegible]

Certified DLC

6/6

EVS CONSULTANTS
SEDIMENT TOXICITY TESTS - SURVIVAL AND FINAL WATER QUALITY DATA

00600

Client NOAA
EVS Project Number 9/618-02-04
EVS W.O. No. 940225

Start Date (Day 0) May 31/94
End Date June 20/94
Test Type/Species Menidia - (20 day)

Solvent

Sample I.D.	Rep.	Pan No.	No. Alive	No. Dead	Total Recovered	No. Missing	Tech. Init.	pH	Dissolved Oxygen (mg/L)	Temp. (°C)	Cond. (µmhos/cm) □ Salinity (ppt) ⊟
DAC-H-Y-16T	A	67	5	0	5	0	PM	7.7	7.2	20	29
	B	162	5	0	5	0	PM	7.8	7.3	20	29
	C	163	5	0	5 ①	0	PM	7.7	7.2	20	30
	D	164	5	0	5	0	PM	7.7	7.1	20	29
	E	165	5	0	5 ①	0	PM	7.7	7.0	20	29
DAC-Hy-18T	A	66	4	0	4 ①	0	3	7.8	6.8	20	29
	B	67	5	0	5 ①	0	3	7.8	7.3	20	29
	C	68	5	0	5 ①	0	3	8.0	7.5	20	30
	D	69	5	0	5	0	3	7.9	5.2 ②	20	29
	E	70	3	0	3	2	3	7.2	2.0 ②	20	29
Technician's Initials								SPB	PS SPB	SPB	SPB

DAC Hy-18T- A N66- Precision poor - No Loss of biomass
B N67- " " " " " " "
C N68- " " " " " " "

Water Quality Instruments: pH II-A-16 #9 D.O. II-A-3 ② Aeration adjusted Cond./Salinity II-C-12

DAC Hy-16T- A N73- Precision poor - No Loss of biomass

EVS CONSULTANTS
ACUTE TOXICITY TEST DATA

Page No. 1/1

SAMPLE ID: NOAA
DATE COLLECTED: Revised May 24/94
TEST DATE/TIME: May 31/94 = 0hrs.
NO. ORGANISMS/VOLUME: 5/Test ~~5/Chamber & 10 Test/Blank Control~~ 5/L

PROJECT NAME: NOAA
EVS PROJECT NO.: 9/618-02-4
WORK ORDER NO.: 940225
TEST SPECIES: Mysidlim.
SOURCE & BATCH: Dan Rich. May 24/94

Setup #1.

CONCN mg/L Cd	PERCENT SURVIVAL (1 to 96 hours)							DISSOLVED OXYGEN (mg/L)					TEMPERATURE (°C)					pH					SALINITY (ppt)	
	1	2	4	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	96
Cd ~~32.0~~ 32.0				0%	—	—	—	7.2	7.3	—	—	—	22	22				7.8	7.6	—	—	—	27	—
18.0				0%	—	—	—	7.2	7.2	—	—	—	22	22	—	—	—	7.8	7.7	—	—	—	27	—
10.0				30%	~~20~~ 0%	~~20~~ ~~20~~ 10	10	7.2	7.2	7.0	6.9	7.2	22	22	21	—	21	7.8	7.7	7.9	7.8	7.9	27	—
5.6				100	100	100	100	7.1	7.2	7.0	7.2	7.2	22	22	21	21	21	7.8	7.7	8.0	7.8	7.9	27	29
3.2				100	100	100	100	7.1	7.2	7.0	7.2	7.2	22	22	21	21	21	7.8	7.7	7.9	7.9	7.9	27	29
1.8				100	100	100	100	7.2	7.2	7.0	7.2	7.0	22	22	21	20.5	21	7.8	7.7	7.9	7.8	7.8	27	29
Control				100	100	100	100	7.2	7.2	7.1	7.1	7.2	22	22	21	20.5	21	7.8	7.7	7.8	7.7	7.9	27	29
Technician				MJ	MJ	ML	ML	RM	MJ	RM	ML	JS	RM	MJ	ST	RM	ML	RM	MJ	ST	ML	JS	RM	JS

SAMPLE DESCRIPTION: 4 Rep. Cd Chs. Five are 2 that are body alive. - 5 brought by were dead yesterday but looked alive in
COMMENTS: Jars 3 ~~Rep~~ Conc. Feeble movements in 2 rep.

TEST SET UP BY: MEP
DATA VERIFIED BY: Judy La Crane
DATE VERIFIED: Aug 10, 1994

EVS ENVIRONMENT CONSULTANTS

0000 7

LC50:STEPHEN IBM/AT VERS 1.0

FILE: NOAA 9/618-02.4 940225

TEST: Reference Toxicant DATE: May 31, 1994
SPECIES: Neanthes arenaceodentata DURATION: 96 hr
CHEMICAL: Cadminum
CARRIER: Seawater CARRIER CONC: 28 ppt

Sample: Reference Toxicant

Conc	Number exposed	Number dead	Percent dead	Binomial prob(percent)
32.00	10	10	100.0	0.0977
18.00	10	10	100.0	0.0977
10.00	10	9	90.0	1.0742
5.60	10	0	0.0	0.0977
3.20	10	0	0.0	0.0977
1.80	10	0	0.0	0.0977

The binom test shows that 5.600 and 10.000 can be used as statistically sound at 95 conf since the actual conf level associated with these limits is 97.852

An approx LC50 is 7.955 mg/L

* warning:probit/mov av fail to give statsound results *
Less than 2 conc where %dead between 0-100

00608

certified QC

EVS CONSULTANTS - *Neanthes* 20-d SEDIMENT TOXICITY TEST
DAILY WATER QUALITY MONITORING

Water Quality Instruments Used

D.O. Meter II-4-3
pH Meter II-A-16 #9
Salinity II-C-12 (refr)
Temperature Thermometer

Client: NOAA
EVS Project No.: 9/618-02-4
EVS W.O. No.: ~~940229~~ 940225
Day 0: May 31/94
Day 20: Jun 20/94
Test Species: Nereis
Source/Collection Date: Don Kiehn / May 29/94

July 41

SAMPLE I.D.		TEMPERATURE (°C)																				SALINITY (ppt)								DISSOLVED OXYGEN (mg/L)								pH							
		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	0	3	6	9	12	15	18	20	0	3	6	9	12	15	18	20	0	3	6	9	12	15	18	20
Control #1	A	21	21	21	20	20.5	20.5	20.5	21	21	20.5	20.5	20.5	20	20	20	20.5	20.0	20.0	20	20	20	21	28	27	29	29	30	30	29	21	7.3	7.3	6.3	6.8	6.5	7.3	7.3	7.5	7.9	7.7	7.8	7.8	7.8	7.8	7.8
	C	22	21	21	21	20.5	20.5	20.5	21	21	20.5	20.5	20.5	20	20	20	20.5	20.0	20.0	20	20	20	21	28	27	29	30	29	29	28	21	6.8	7.0	6.4	6.7	6.6	7.3	7.3	7.5	7.8	7.8	7.7	7.9	7.8	7.8	7.9	7.8
Control #2	B	22	21	21	20	20.5	21	20.5	21	21	20.5	20.5	20.5	20	20	20	20.5	20.0	20.0	20	20	20	21	29	28	29	29	29	29	27	21	7.1	7.1	6.6	6.8	6.8	7.3	7.4	7.5	7.8	7.8	7.7	7.8	7.9	7.9	7.9	7.5
	D	22	21	21	20	20.5	21	20.5	21	21	20.5	20.5	20.5	20	20	20	20.5	20.0	20.0	20	20	20	21	29	27	29	29	29	29	28	21	7.0	7.1	6.5	6.8	6.8	7.4	7.5	7.5	7.8	7.7	7.9	7.9	7.9	8.0	7.9
DAC-Hy-20T	A	22	21	21	20.5	21	20.5	21	21	20.5	20.5	20	20	20	20	20	20	20.0	20.0	20	20	20	21	27	27	29	29	29	29	31	21	7.0	7.2	6.4	6.6	6.6	7.3	7.6	7.6	7.8	8.0	8.1	7.9	7.9	7.9	7.7
	E	22	21	21	20.5	21	20.5	21	21	20.5	20.5	20	20	20	20	20	20	20.0	20.0	20	20	20	21	27	26	29	29	29	30	31	21	7.0	7.2	6.0	6.6	6.6	7.2	7.6	7.6	7.8	8.0	8.1	8.0	8.0	7.8	7.7
DAC-Hy-17T	B	22	21	20.5	20.5	21	20.5	21	21	20.5	20.5	20	20	20	20	20	20.0	20.0	20.0	20	20	20	21	21	26	30	29	29	30	30	21	7.1	7.4	6.5	6.7	6.7	7.4	7.6	7.6	7.8	7.8	7.9	8.0	8.0	8.0	7.8
	C	22	21	20.5	20.5	21	20.5	21	21	20.5	20.5	20	20	20	20	20	20.0	20.0	20.0	20	20	20	21	27	27	29	30	29	29	29	21	6.9	7.4	6.6	6.7	6.5	7.3	7.1	7.5	7.8	7.9	7.8	8.0	8.0	8.0	7.8
DAC-Hy-23T	C	22	21	20.5	20.5	20.5	20.5	21	21	20.5	20.5	20	20	20	21	20	20.0	20.0	20.0	20	20	20	21	26	26	29	29	29	29	30	21	7.0	7.4	6.6	6.7	6.7	7.4	6.7	7.5	7.8	7.8	7.9	7.8	7.8	7.9	7.6
	E	22	21	21	20.5	20.5	20.5	21	21	20.5	20.5	20	20	20	20	20	20	20.0	20.0	20	20	20	21	27	26	28	29	29	29	30	21	7.0	7.0	6.4	6.2	6.7	7.3	7.4	7.5	7.7	7.8	7.9	7.7	7.9	7.7	7.7
DAY																																													
Technician's Initials																																													

Comments/Adjustments Made: Day 3 ⓐ Adjusted aeration (lowered) 23T

Use only black, ball-point pen. Cross out errors with a single line; initial and date corrections. Do not use "White-Out", correcting tape or eraser to make changes.

\Forms\Animals\Amenities.264

Certified QLC Aug 10, 1994

CONTROL #1 GOES WITH DAC-HY-14T, 15T, 17T, 19T, 20T, 21T, 22T, 23T, R&D CONTROL

CONTROL #2 GOES WITH DAC-HY-13T, 16T, 18T, 24T

000090

SEDIMENT TOXICITY TEST

DAILY WATER QUALITY MONITORING

Water Quality Instruments Used

D.O. Meter II-A-3
pH Meter II-A-16 #9
Salinity II-C-12 (YSI)
Temperature Thermometer

Client: NOAA
EVS Project No.: 9/618-02-4
EVS W.O. No.: 940725
Day 0: May 31/94
Day 20: June 20/94
Test Species: M. balthica
Source/Collection Date: Don Kiche May 24/94

Salinity #1

SAMPLE ID.	TEMPERATURE (°C)																					SALINITY (ppt)								DISSOLVED OXYGEN (mg/L)								pH							
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	0	3	6	9	12	15	18	20	0	3	6	9	12	15	18	20	0	3	6	9	12	15	18	20
DAC-Hy-18T B	20	22	21	21	20.5	20.5	20.5	21	21	20.5	20.5	20.5	20	20	20	20	20	20	20	20	20	21	27	26	29	28	29	29	29	7.1	7.0	7.1	6.6	6.7	6.3	7.3	7.3	7.8	7.9	7.9	8.0	7.8	7.7	7.4	7.3
C	20	22	21	20.5	20.5	20.5	20.5	21	21	20.5	20.5	20.5	20	20	20	20	20	20	20	20	20	21	28	27	28	28	30	30	30	7.1	7.0	7.2	4.8	6.6	6.7	7.5	7.5	7.8	7.9	7.9	7.9	7.9	8.1	8.1	8.0
DAC-Hy-22T A	20	22	21	21	20.5	20.5	20.5	21	21	20.5	20.5	20.5	20	20	20	20	20	20	20	20	20	21	27	26	27	30	29	29	29	7.1	6.5	7.0	6.5	6.2	6.4	6.5	6.4	7.8	7.7	7.9	8.0	7.3	8.0	8.0	7.7
B	20	22	21	21	20.5	20.5	20.5	21	21	20.5	20.5	20.5	20	20	20	20	20	20	20	20	20	21	27	24	27	31	30	29	29	7.2	6.9	7.2	6.4	6.2	6.2	6.5	7.3	7.8	7.8	7.9	8.1	7.8	7.7	8.0	7.8
DAC-Hy-14T C	20	22	21	20.5	20.5	20.5	20.5	21	21	20.5	20.5	20	20	20	20	20	20	20	20	20	20	21	27	26	28	31	27	29	31	7.0	6.9	7.3	6.6	6.7	6.8	6.8	7.2	7.8	7.8	8.0	8.0	7.7	8.0	7.9	7.8
D	20	22	21	21	20.5	20.5	20.5	21	21	20.5	20.5	20	20	20	20	20	20	20	20	20	20	21	27	26	28	30	29	29	31	7.0	7.0	7.1	6.5	6.7	6.2	4.8	7.2	7.8	7.8	7.8	8.0	8.0	7.9	7.5	7.7
DAC-Hy-15T B	20	22	21	21	20.5	20.5	20.5	21	21	20.5	20.5	20	20	20	20	20	20	20	20	20	20	21	27	26	28	29	28	29	31	6.9	7.2	7.2	6.7	5.8	6.7	6.2	6.5	7.8	7.9	7.8	8.1	7.7	7.9	7.8	7.6
D	20	22	21	21	20.5	20.5	20.5	21	21	20.5	20.5	20	20	20	20	20	20	20	20	20	20	21	28	26	28	29	25	30	31	7.1	6.8	7.2	6.1	6.5	6.7	6.6	7.3	7.8	7.8	7.9	8.0	8.0	8.0	7.8	7.8
DAC-Hy-19T A	20	22	21	20.5	20.5	20.5	20.5	21	21	20.5	20.5	20	20	20	20	20	20	20	20	20	20	21	27	27	29	30	29	30	30	7.0	7.0	7.2	6.7	6.2	6.7	6.6	7.0	7.8	7.9	8.0	8.1	8.0	8.0	8.0	7.8
C	20	22	21	20.5	20.5	20.5	20.5	21	21	20.5	20.5	20	20	20	20	20	20	20	20	20	20	21	28	27	29	31	29	30	30	7.0	7.0	7.2	6.7	6.7	6.7	5.7	6.4	7.8	7.9	7.9	8.1	8.0	7.8	7.7	7.7
Technician's Initials																																													

Comments/Adjustments Made: ① Aeration off. Adjusted. ② ② Increased aeration rate ③ increased aeration rate
22T-V Low DO. Unknown Cause -- will check. Jun 13/94. = DO 6.5

Certified Aug 10, 1994

Use only black, ball-point pen. Cross out errors with a single line; initial and date corrections. Do not use "White-Out", correcting tape or eraser to make changes.

EVS CONSULTANTS - *Neanthes* 20-d SEDIMENT TOXICITY TEST
DAILY WATER QUALITY MONITORING

Water Quality Instruments Used

D.O. Meter II-A-3
pH Meter II-A-16 #9
Salinity II-C-12 (refr)
Temperature thermometer

Client: NOAA
EVS Project No.: 9/618-02-4
EVS W.O. No.: 940225
Day 0: May 31/94
Day 20: June 20/94
Test Species: Nereis
Source/Collection Date: Don Kiehl May 24/94

Sal #1

SAMPLE I.D.	TEMPERATURE (°C)																					SALINITY (ppt)								DISSOLVED OXYGEN (mg/L)								pH							
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	0	3	6	9	12	15	18	20	0	3	6	9	12	15	18	20	0	3	6	9	12	15	18	20
DAC-Hy-24 TA	21	22	21	21	21	20.5	20.5	21	21	20.5	20.5	20	20	20	20	20.5	20	21	20	20	20	27	28	27	30	31	30	32	31	6.4	7.0	7.2	6.8	6.9	6.7	6.5	7.1	7.8	8.1	8.0	8.1	8.0	7.9	7.8	7.7
E	21	22	21	21	21	20.5	20.5	21	21	20.5	20.5	20	20	20	20	20.5	20	21	20	20	20	27	28	24	28	29	29	31	30	7.1	6.8	7.2	6.4	6.2	6.7	6.4	6.7	7.8	8.0	7.9	8.0	7.8	8.1	8.0	7.7
DAC-Hy-21T C	21	22	21	20.5	21	20.5	20.5	21	21	20.5	20.5	20	20	20	20	20.5	20	21	20	20	20	27	27	26	29	28	29	30	30	7.1	6.9	7.2	6.4	6.6	6.9	5.0	7.0	7.8	8.0	8.1	8.2	8.1	8.2	7.7	8.1
B	21	22	21	20.5	21	20.5	20.5	21	21	20.5	20.5	20	20	20	20	20.5	20	21	20	20	20	27	27	26	28	29	29	31	30	7.5	6.5	5.9	5.5	6.7	5.6	7.1	7.8	8.0	8.0	7.8	8.1	7.7	8.2		
DAC-Hy-13T B	21	22	21	20.5	21	20.5	20.5	21	21	20.5	20.5	20	20	20	20	20.5	20	21	20	20	20	27	27	27	30	32	32	33	30	7.0	6.9	7.3	6.8	6.0	6.8	6.7	7.0	7.8	7.9	7.9	8.1	7.8	8.0	8.1	7.9
C	21	22	21	20.5	21	20.5	20.5	21	21	20.5	20.5	20	20	20	20	20.5	20	21	20	20	20	27	28	26	29	30	32	31	31	7.2	7.0	7.2	6.4	6.6	6.8	6.6	7.1	7.8	7.8	7.9	8.0	7.8	8.0	8.0	7.9
DAC-Hy-16T C	21	22	21	20.5	21	20.5	20.5	21	21	20.5	20.5	20	20	20	20	20.5	20	21	20	20	20	27	27	26	28	30	29	30	30	7.2	6.9	7.2	6.7	6.5	6.7	6.4	7.2	7.8	7.9	7.9	7.9	7.8	7.8	7.9	7.7
D	21	22	21	20.5	21	20.5	20.5	21	21	20.5	20.5	20	20	20	20	20.5	20	21	20	20	20	27	28	27	30	31	31	31	29	7.2	7.0	7.4	6.8	6.8	6.7	7.4	7.1	7.8	7.9	8.0	8.0	7.9	7.7	7.0	7.7
RA Control A	21	22	21	20.5	21	20.5	20.5	21	21	20.5	20.5	20	20	20	20	20.5	20	21	20	20	20	27	28	26	28	27	29	29	27	7.2	7.0	7.0	6.6	6.7	6.9	6.5	7.4	7.8	7.6	7.8	7.8	7.9	7.9	7.9	7.9
C	21	22	21	20.5	21	20.4	20.5	21	21	20.5	20.5	20	20	20	20	20.5	20	21	20	20	20	27	27	24	28	27	29	31	27	7.2	7.0	7.0	5.8	6.0	6.9	6.3	7.4	7.8	7.6	7.9	7.7	8.0	7.8	7.9	
Technician's Initials																																													

Comments/Adjustments Made: ① aeration off - adjusted pH ② increased aeration pH

Centrifuged YCC Aug 10, 1994

Use only black, ball-point pen. Cross out errors with a single line; initial and date corrections. Do not use "White-Out", correcting tape or eraser to make changes.

\Forms\Neanthes\Neanthes.20d

000111

Nuanthes 9/618-02.4
W.O.# 940225

Setup #1 - Day 2

RESULTS OF ANALYSIS - Water

File No. D9741

		DAC-HY-13N	DAC-HY-14N	DAC-HY-15N	DAC-HY-16N	DAC-HY-17N
Nutrients						
Ammonia Nitrogen	N	0.370	0.420	0.470	0.270	0.260
Inorganic Parameters						
Sulphide	S	<0.02	<0.02	<0.02	<0.02	0.06

Results are expressed as milligrams per litre.
< = Less than the detection limit indicated.

00612

Neanthes 9/w18-024 W.O.# 940225 Setup #1 - Day 0

RESULTS OF ANALYSIS - Water

File No. D9741

		DAC-HY-18N	DAC-HY-19N	DAC-HY-20N	DAC-HY-21N	DAC-HY-22N
Nutrients						
Ammonia Nitrogen	N	0.460	0.550	0.430	0.670	0.570
Inorganic Parameters						
Sulphide	S	<0.02	<0.02	<0.02	<0.02	<0.02

Results are expressed as milligrams per litre.
< = Less than the detection limit indicated.

00613

Neanthes - 9/018-02.4
W.O. # 940225

Setup #1 - Day 0

RESULTS OF ANALYSIS - Water

File No. D9741

		DAC-HY-23N	DAC-HY-24N	Control 1N	Control 2N
Nutrients					
Ammonia Nitrogen	N	0.380	0.380	0.330	0.290
Inorganic Parameters					
Sulphide	S	<0.02	<0.02	<0.02	<0.02

Results are expressed as milligrams per litre.
< = Less than the detection limit indicated.

00614

1988 Triumph Street, Vancouver, B.C., Canada V5L 1K5

analytical service laboratories ltd.

FAX: (604) 253-6700 TEL: (604) 253-4188

Nearides
9/618-02.4
W.O.# 940225

Setup #1 - Day 20

CHEMICAL ANALYSIS REPORT

Date: June 29, 1994

ASL File No. E1362

Report On: 9/618-02.4 Water Analysis

Report To: **EVS Environment Consultants**
195 Pemberton Avenue
North Vancouver, BC
V7P 2R4

Attention: **Mr. Todd Shannon**

Received: June 21, 1994

ASL ANALYTICAL SERVICE LABORATORIES LTD.
per:

Heather A. Ross, B.Sc.
Project Chemist

Katherine Thomas, B.Sc.
Project Chemist

00615

Neanthes 9/018-02 4
W.O.# 940225

Setup #1 - Day 20

RESULTS OF ANALYSIS - Water

File No. E1362

		DAC-HY 20T N	DAC-HY 17T N	DAC-HY 23T N	DAC-HY 22T N	Control Sediment #2 N
Nutrients						
Ammonia Nitrogen	N	0.15	4.16	0.13	0.30	7.19
Inorganic Parameters						
Sulphide	S	<0.02	0.06	<0.02	<0.02	<0.02

Results are expressed as milligrams per litre.
< = Less than the detection limit indicated.

00616

Neanthes 9/618-02 4
W.O. # 940225

Setup #1 - Day 20

RESULTS OF ANALYSIS - Water

File No. E1362

		Control Sediment #1 N	DAC-HY 14T N	DAC-HY 21T N	DAC-HY 16T N	DAC-HY 19T N
Nutrients						
Ammonia Nitrogen	N	6.68	0.55	0.19	0.17	0.14
Inorganic Parameters						
Sulphide	S	<0.02	<0.02	<0.02	<0.02	<0.02

Results are expressed as milligrams per litre.
< = Less than the detection limit indicated.

00617

Neanthes 9/6018-02.4 Setup #1 - Day 20
W.O.# 940225

RESULTS OF ANALYSIS - Water

File No. E1362

		DAC-HY 15T N	DAC-HY 24T N	DAC-HY 18T N	DAC-HY 13T N
Nutrients					
Ammonia Nitrogen	N	0.14	3.61	1.52	0.24
Inorganic Parameters					
Sulphide	S	<0.02	<0.02	<0.02	<0.02

Results are expressed as milligrams per litre.
< = Less than the detection limit indicated.

00618

Neanthes 9/618-01.4
W.O. # 940225

Setup #1 - Day 20

METHODOLOGY

File No. E1362

Samples were analyzed by methods acceptable to the appropriate regulatory agency. Outlines of the methodologies utilized are as follows:

Conventional Parameters in Water

These analyses are carried out in accordance with procedures described in "Standard Methods for the Examination of Water and Wastewater" 18th Ed. published by the American Public Health Association, 1992. Further details are available on request.

End of Report

00619

EVS CONSULTANTS

Dry Weight Data

Client:	NOAA – Setup #2	Test Species:	*Neanthes arenaceodentata*
Project #:	9/618–02.4	Date Initiated:	June 3, 1994
Work Order:	940225	Date Terminated:	June 23, 1994
Test Type:	20–d sediment toxicity test		
		Number of Animals/rep:	5

Sample ID	Rep	Survivors	# of Animals Weighed	Pan Weight (g)	Final Weight (pan + biomass) (g)	Total Biomass (mg)	Individual Biomass (mg)	Mean Survival (%)	Mean Individual Biomass (mg)
Initial Dry Weight N–D	A	5	5	0.9927	0.9936	0.90	0.18	100.00	0.19
Initial Dry Weight N–E	B	5	5	0.9957	0.9960	0.30	0.06		
Initial Dry Weight N–F	C	5	5	0.9990	0.9998	0.80	0.16		

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00640

for data entry only

Certified JLC
Aug 15 1994

EVS CONSULTANTS

Dry Weight Data

Client: NOAA – Setup #2
Project #: 9618–02.4
Work Order: 940225
Test Type: 20–d sediment toxicity test

Test Species: *Neanthes arenaceodentata*
Date Initiated: June 3, 1994
Date Terminated: June 23, 1994

Number of Animals/rep: 5

Sample ID	Rep	Survivors	# of Animals Weighed	Pan Weight (g)	Final Weight (pan + biomass) (g)	Total Biomass (mg)	Individual Biomass (mg)	Mean Survival (%)	Mean Individual Biomass (mg)
Control 1	A	5	5	1.0000	1.0509	50.90	10.06	100.00	10.22
	B	5	5	1.0051	1.0567	51.60	10.32		
	C	5	5	1.0052	1.0580	52.80	10.56		
	D	5	5	1.0017	1.0480	46.30	9.26		
	E	5	5	1.0010	1.0555	54.50	10.90		
DAC–HY–4T	A	5	5	1.0018	1.0610	59.20	11.84	100.00	10.14
	B	5	5	1.0035	1.0546	51.10	10.22		
	C	5	5	1.0032	1.0424	39.20	7.84		
	D	5	5	1.0100	1.0600	50.00	10.00		
	E	5	5	1.0000	1.0540	54.00	10.80		
DAC–HY–6T	A	5	5	0.9989	1.0554	56.50	11.30	100.00	11.42
	B	5	5	0.9966	1.0494	52.80	10.56		
	C	5	5	0.9933	1.0581	64.80	12.96		
	D	5	5	0.9987	1.0528	54.10	10.82		
	E	5	5	0.9924	1.0496	57.20	11.44		
DAC–HY–7T	A	5	5	1.0027	1.0614	58.70	11.74	100.00	10.20
	B	5	5	0.9954	1.0434	48.00	9.60		
	C	5	5	1.0000	1.0510	51.00	10.20		
	D	5	5	0.9962	1.0424	46.20	9.24		
	E	5	5	1.0035	1.0546	51.10	10.22		

00621

certified for data entry only
ILC June 17, 1994

EVS CONSULTANTS

Dry Weight Data

Client: NOAA – Setup #2
Project #: 9618–02.4
Work Order: 940225
Test Type: 20–d sediment toxicity test

Test Species: *Neanthes arenaceodentata*
Date Initiated: June 3, 1994
Date Terminated: June 23, 1994

Number of Animals/rep: 5

Sample ID	Rep	Survivors	# of Animals Weighed	Pan Weight (g)	Final Weight (pan + biomass) (g)	Total Biomass (mg)	Individual Biomass (mg)	Mean Survival (%)	Mean Individual Biomass (mg)
DAC–HY–9T	A[1]	5	5	1.0073	1.0693	62.00	12.40	100.00	9.98
	B	5	5	1.0002	1.0143	14.10	2.82		
	C	5	5	1.0008	1.0606	59.80	11.96		
	D	5	5	1.0048	1.0595	54.70	10.94		
	E	5	5	1.0000	1.0590	59.00	11.80		
DAC–HY–10T	A	5	5	1.0020	1.0512	49.20	9.84	96.00	9.33
	B	4	4	1.0008	1.0405	39.70	9.93		
	C	5	5	1.0027	1.0476	44.90	8.98		
	D	5	5	0.9973	1.0475	50.20	10.04		
	E	5	5	0.9983	1.0377	39.40	7.88		
DAC–HY–12T	A	5	5	1.0002	1.0528	52.60	10.52	100.00	10.73
	B	5	5	0.9928	1.0269	34.10	6.82		
	C	5	5	1.0031	1.0690	65.90	13.18		
	D	5	5	0.9942	1.0546	60.40	12.08		
	E	5	5	0.9988	1.0490	55.20	11.04		
DAC–HY–26T	A	5	5	1.0000	1.0454	45.40	9.08	100.00	10.07
	B	5	5	0.9967	1.0394	42.70	8.54		
	C	5	5	1.0034	1.0393	35.90	7.18		
	D	5	5	1.0026	1.0616	59.00	11.80		
	E	5	5	1.0036	1.0724	68.80	13.76		

1. This replicate (DAC–HY–9T–A) was missing a small piece of one of the organisms.

00622

H:\user\jcamp\961802\940225n.wk1

certified for data entry only
QC Aug 17, 1994

EVS CONSULTANTS

Dry Weight Data

Client:	NOAA -- Setup #2	Test Species:	*Neanthes arenaceodentata*
Project #:	9618-02.4	Date Initiated:	June 3, 1994
Work Order:	940225	Date Terminated:	June 23, 1994
Test Type:	20-d sediment toxicity test		
		Number of Animals/rep:	5

Sample ID	Rep	Survivors	# of Animals Weighed	Pan Weight (g)	Final Weight (pan + biomass) (g)	Total Biomass (mg)	Individual Biomass (mg)	Mean Survival (%)	Mean Individual Biomass (mg)
DAC-HY-27T	A	5	5	0.9982	1.0361	37.90	7.58	100.00	6.15
	B[2]	10	10	0.9984	1.0612	62.80	6.28		
	C[3]	0	0	1.0010	—	—	—		
	D	5	5	0.9940	1.0387	44.70	8.94		
	E	5	5	0.9936	1.0334	39.80	7.96		
DAC-HY-28T	A	5	5	0.9970	1.0522	55.20	11.04	100.00	10.00
	B	5	5	0.9987	1.0474	48.70	9.74		
	C	5	5	1.0005	1.0368	36.30	7.26		
	D[4]	5	5	1.0038	1.0546	50.80	10.16		
	E	5	5	0.9957	1.0548	59.10	11.82		

2. This replicate (DAC-HY-27T-B) was double seeded with 10 organisms.

3. This replicate (DAC-HY-27T-C) was missed in the seeding process. All calculations for this sample (DAC-HY-27T) are based on 4 replicates.

4. This replicate (DAC-HY-28T-D) appeared to be missing a small piece of one of the organisms.

00623

H:\user\jenny\961802.4\940225n.wk1

certified for data entry only
Aug 18, 1994 RC

RVS CONSULTANTS

Dry Weight Data

Client: NOAA -- Setup #2
Project #: 94518--02.4
Work Order: 940225
Test Type: 20--d sediment toxicity test

Test Species: *Nuculana acuminata*
Date Initiated: June 3, 1994
Date Terminated: June 23, 1994

Number of Animals/rep: 5

Sample ID	Rep	Survivors	# of Animals Weighed	Pan Weight (g)	Final Weight (pan + biomass) (g)	Total Biomass (mg)	Individual Biomass (mg)	Mean Survival (%)	Mean Individual Biomass (mg)
Control 2	A	5	5	1.0033	1.0404	37.10	7.42	100.00	9.67
	B	5	5	0.9993	1.0443	45.00	9.00		
	C	5	5	1.0018	1.0522	50.40	10.08		
	D	5	5	0.9972	1.0450	47.80	9.56		
	E	5	5	1.0043	1.0657	61.40	12.28		
DAC-HY-1T	A	5	5	0.9999	1.0517	51.80	10.36	100.00	10.12
	B[5]	5	5	0.9951	1.0514	56.30	11.26		
	C	5	5	1.0024	1.0514	49.00	9.80		
	D[5]	5	5	0.9977	1.0452	47.50	9.50		
	E	5	5	1.0002	1.0485	48.30	9.66		
DAC-HY-2T	A	5	5	0.9990	1.0406	41.60	8.32	96.00	7.36
	B	4	4	1.0010	1.0215	20.50	5.13		
	C	5	5	0.9988	1.0454	46.60	9.32		
	D	5	5	1.0010	1.0346	33.60	6.72		
	E	5	5	1.0073	1.0438	36.50	7.30		
DAC-HY-3T	A	5	5	1.0006	1.0571	56.50	11.30	100.00	10.37
	B	5	5	1.0047	1.0454	40.70	8.14		
	C	5	5	1.0045	1.0608	56.30	11.26		
	D	5	5	1.0015	1.0632	61.70	12.34		
	E	5	5	1.0000	1.0440	44.00	8.80		

5. These replicates (DAC-HY-1T-B, D) were missing pieces of some of the organisms.

00624

H:\user\jean\961802\940225a.wk1

certified for data entry only:
Aug 17, 1994

EVS CONSULTANTS

Dry Weight Data

Client:	NOAA – Setup #2	**Test Species:**	*Nasutiter arenaeodentata*
Project #:	9(618–02.4	**Date Initiated:**	June 3, 1994
Work Order:	940225	**Date Terminated:**	June 23, 1994
Test Type:	20–d sediment toxicity test		

Number of Animals/rep: 5

Sample ID	Rep	Survivors	# of Animals Weighed	Pan Weight (g)	Final Weight (pan + biomass) (g)	Total Biomass (mg)	Individual Biomass (mg)	Mean Survival (%)	Mean Individual Biomass (mg)
DAC–HY–5T	A	5	5	1.0017	1.0606	58.90	11.78	92.00	12.58
	B	5	5	1.0024	1.0620	59.60	11.92		
	C[6]	5	5	1.0061	1.0625	56.40	11.28		
	D	4	4	1.0064	1.0593	52.90	13.22		
	E	4	4	1.0007	1.0594	58.70	14.67		
DAC–HY–8T	A[6]	5	5	1.0003	1.0585	58.20	11.64	96.00	11.48
	B	5	5	1.0036	1.0658	62.20	12.44		
	C	5	5	1.0037	1.0648	61.10	12.22		
	D	4	4	1.0052	1.0427	37.50	9.37		
	E	5	5	1.0057	1.0643	58.60	11.72		
DAC–HY–11T	A	5	5	1.0016	1.0490	47.40	9.48	100.00	9.10
	B	5	5	0.9973	1.0467	49.40	9.88		
	C	5	5	1.0000	1.0391	39.10	7.82		
	D	5	5	1.0041	1.0450	40.90	8.18		
	E	5	5	1.0003	1.0509	50.60	10.12		
DAC–HY–25T	A[7]	5	5	0.9952	1.0476	52.40	10.48	96.00	9.18
	B	5	5	0.9933	1.0323	36.80	7.36		
	C[7]	5	5	0.9965	1.0362	39.70	7.94		
	D	5	5	1.0006	1.0528	52.20	10.44		
	E	4	4	0.9936	1.0323	38.70	9.67		

6. These replicates (DAC–HY–8T–A and DAC–HY–5T–C) were missing pieces of some of the organisms.
7. These replicates (DAC–HY–25T–A,C) were missing pieces of some of the organisms.

00625

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certified for data entry only
Aug. 17, 1994

Dendraster spp - 9/618-02.4
W.O. # 940225

Setup # 2 48-h

ASL

RESULTS OF ANALYSIS - Water

File No. E1141

		Control Sediment #2 EL 94 06 11	Control Seawater #1 EL 94 06 11	Control Seawater #2 EL 94 06 11	DAC-HY-14T EL 94 06 11
Nutrients					
Ammonia Nitrogen	N	0.05	0.09	0.10	0.08
Inorganic Parameters					
Sulphide	S	<0.02	<0.02	<0.02	<0.02

Remarks regarding the analyses appear at the beginning of this report.
Results are expressed as milligrams per litre.
< = Less than the detection limit indicated.

00718

00627 1/8

EVS CONSULTANTS
SEDIMENT TOXICITY TESTS - SURVIVAL AND FINAL WATER QUALITY DATA

Client NOAA
EVS Project Number 9/618-02-4
EVS W.Q. No. 940225

Start Date (Day 0) June 3 = Day "0"
End Date June 23 = 20 Days
Test Type/Species Ampelisca abdita

Sed appl #2

Sample I.D.	Rep.	Pan No.	No. Alive	No. Dead	Total Recovered	No. Missing	Tech. Init.	pH	Dissolved Oxygen (mg/L)	Temp. (°C)	Cond. (µmhos/cm) ☐ Salinity (ppt) ☑
Control Sed #1	80	A	5	0	5	0	JS	7.9	7.5	20	28
	81	B	5	0	5	0	JS	7.8	7.4	20	28
	82	C	5	0	5	0	JS	7.7	7.2	20	28
	83	D	5	0	5	0	JS	7.8	7.2	20	28
	84	E	5	0	5 ①	0	JS	7.9	7.2	20	28
Control Sed #2	85	A	5	0	5	0	RM	7.8	7.2	20	28
	86	B	5	0	5	0	RM	7.9	7.3	20	29
	87	C	5	0	5	0	RM	8.0	7.4	20	29
	88	D	5	0	5	0	RM	8.0	7.4	20	28
	89	E	5	0	5	0	RM	7.9	7.2	20	28
DAC-Hg-9T	90	A	5	0	5 ①	0	JS	7.9	6.3	20	32
	91	B	5	0	5	0	JS	7.4	② 2.0	20	32
	92	C	5	0	5	0	JS	8.1	6.0	20	33
	93	D	5	0	5	0	JS	8.0	6.2	20	32
	94	E	5	0	5	0	JS	8.1	6.4	20	33
							Technician's Initials	JS RLS	RLS JS	RLS JS	RLS JS

yDAC-Hg-9T A = N90 - Overturned
Control 2nd #1 - E = N89 - Poor pushed against Diffuser over Bottom Weight

Water Quality Instruments: pH TI-A-16 #9 D.O. TI-A-3 Cond./Salinity TI-C-17

① Small pieces missing from the end of one N. [illegible]
② Aeration stopped

Control 2nd #1 - E = N89 - Poor pushed against Diffuser over Bottom Weight

W.O. # 940225

RESULTS OF ANALYSIS - Water

File No. E1141

		DAC-HY-6T EL	DAC-HY-28T EL	DAC-HY-3T EL	DAC-HY-7T EL	DAC-HY-4T EL
		94 06 11	94 06 11	94 06 11	94 06 11	94 06 11
Nutrients						
Ammonia Nitrogen	N	0.10	0.17	0.12	0.10	0.21
Inorganic Parameters						
Sulphide	S	<0.02	<0.02	<0.02	<0.02	<0.02

Remarks regarding the analyses appear at the beginning of this report.
Results are expressed as milligrams per litre.
< = Less than the detection limit indicated.

00716

00629 3/8

EVS CONSULTANTS
SEDIMENT TOXICITY TESTS - SURVIVAL AND FINAL WATER QUALITY DATA

Client NOAA
EVS Project Number 9/618-02-4
EVS W.O. No. 940225

Start Date (Day 0) June 3 = Day "0"
End Date June 23 = 20 days
Test Type/Species Neanthes arenaceodentata

Sulphide

Sample I.D.	Rep.	Pan No.	No. Alive	No. Dead	Total Recovered	No. Missing	Tech. Init.		pH	Dissolved Oxygen (mg/L)	Temp. (°C)	Conc. (µmhos/cm) ☐ Salinity (ppt) ☑
DAC-Hy-1T	A	110	5	0	5	0	PM		7.7	6.0	20	31
	B	111	5	0	5	0	PM		7.4	5.8	20	31
	C	112	5	0	5	0	PM		7.8	6.2	20	31
	D	113	5	0	5	0	PM		7.9	6.5	20	31
	E	114	5	0	5	0	PM		7.8	6.8	20	31
DAC-Hy-12T	A	115	5	0	5	0	Z		8.0 SH ~~7.4~~	6 ~~7~~.2 ar	20	31
	B	116	5	0	5	0	Z		7.8 SH ~~7.0~~	6.2	20	30
	C	117	5	0	5	0	Z		7.9 SH ~~7.4~~	6.4	20	33
	D	118	5	0	5	0	Z		7.9	6.0	20	30
	E	119	5	0	5	0	Z		8.0	6.3	20	31
DAC-Ay-26T	A	120	5	0	5	0	PM		7.4	5.6	20	31
	B	121	5	0	5	0	PM		7.7	6.0	20	31
	C	122	5	0	5	0	PM		7.9	6.2	20	30
	D	123	5	0	5	0	PM		7.9	6.2	20	32
	E	124	5	0	5	0	PM		7.9	6.2	20	31
						Technician's Initials			PLS	PLS	PLS	PLS

Water Quality Instruments: pH II-A-16 #9 D.O. II-A-3 Cond./~~Salinity~~ II-C-12

[illegible] Aug 11, 199[illegible]

Benchsheet W.O.# 940225

REMARKS

File No. E1141

As indicated on the sample submission form, these samples are identified as "Day 48-h Teardown (June 11, 1994) Echinoderm Larval".

00714

00631 5/8

EVS CONSULTANTS
SEDIMENT TOXICITY TESTS - SURVIVAL AND FINAL WATER QUALITY DATA

Client: NOAA
EVS Project Number: 9/618-02.4
EVS W.O. No.: 940225

Start Date (Day 0): June 3 = Day "0"
End Date: June 23 = 20 days
Test Type/Species: Neanthes arenaceodentata

Sedsp #

Sample I.D.	Rep.	Pan No.	No. Alive	No. Dead	Total Recovered	No. Missing	Tech. Init.		pH	Dissolved Oxygen (mg/L)	Temp. (°C)	Cond. (µmhos/cm) ☐ Salinity (ppt) ☑
AQD Control	A	140	4	0	4	1	J		7.9	7.4	20	27
	B	141	5	0	5	0	J		7.9	7.4	20	28
	C	142	5	0	5	0	J		8.0	7.4	20	28
	D	143	5	0	5	0	J		7.9	7.3	20	28
	E	144	5	0	5	0	J		8.0	7.3	20	29
											20	
Technician's Initials									J	J	J	J

Water Quality Instruments: pH II-A-16 #9 D.O. II-A-3 Cond./~~Salinity~~ II-C-12

Certified JL

Dendraster spp. 9/618-02.4 Setup #2 Day 0
W.O. # 940226

METHODOLOGY

File No. E1112

Samples were analyzed by methods acceptable to the appropriate regulatory agency. Outlines of the methodologies utilized are as follows:

Conventional Parameters in Water

These analyses are carried out in accordance with procedures described in "Standard Methods for the Examination of Water and Wastewater" 18th Ed. published by the American Public Health Association, 1992. Further details are available on request.

End of Report

00712

00633

7/8

EVS CONSULTANTS
SEDIMENT TOXICITY TESTS - SURVIVAL AND FINAL WATER QUALITY DATA

Client NOAA
EVS Project Number 9/618-02.4
EVS W.O. No. 940225

Start Date (Day 0) June 3 = Day "0"
End Date June 23 = 20 days
Test Type/Species Neanthes arenaceodentata

Set up #2

* WQ Flipped.

Sample I.D.	Rep.	Pan No.	No. Alive	No. Dead	Total Recovered	No. Missing	Tech. Init.		pH	Dissolved Oxygen (mg/L)	Temp. (°C)	Cond. (µmhos/cm) ☐ Salinity (ppt) ☑	
DAC-CR-~~2AT~~ 2T (PL)	A	160	5	0	5	0	RM	DAC-CR-2AT A	8.0	6.0	20	29	A
(~~4 brittle stars~~)	B	161	4	0	4	1	RM	B	8.0	6.4	20	30	B
	C	162	4	0	4	1	RM	C	8.1	6.2	20	29	C
	D	163	5	0	5	0	RM	D	8.0	6.3	20	30	D
	E	164	5	0	5	0	RM	E	8.0	7.2	20	30	E
DAC-CR-~~2T~~ 2AT (PL)	A	165	5	0	5	~~0~~ 0	3	DAC-CR-2T A	7.9	6.7	20	30	A
(4 brittle stars)	B	166	5	0	5	~~5~~ 0	3	B	8.2	7.2	20	30	B
	C	167	5	0	5	~~5~~ 0	3	C	8.2	7.1	20	29	C
	D	168	4	0	4	~~4~~ 1	3	D	8.1	7.2	20	30	D
	E	169	4	0	4	1	3	E	8.1	7.2	20	30	E
DAC-Hg-1T	A	170	5	0	5	0	3		8.0	7.2	20	30	
	B	171	5	0	5 ②	0	3		8.1	7.3	20	30	
	C	172	5	0	5 ①	0	3		8.0	7.2	20	30	
	D	173	5	0	5 ①②	0	3		8.1	7.4	20	31	
	E	174	5	0	5	0	3		8.1	7.4	20	31	
								Technician's Initials	EJT (PL)	EJT (PL)	EJT (PL)	EJT (PL)	

DAC-CR-2AT

DAC-CR-2T

* brittle stars NOT IN PANS N 172 + N 173.

Water Quality Instruments: pH II-A-16 #9 D.O. II-A-3 Cond/Salinity II-C-12

certified JLC 1951

(1) very small brittle star found in the sample PL)

DAC-Hg-1T-B-N-171 - Conformal
[illegible] 172 - brittle star not in pan 5

Denaraster spp. 41018-02.4 Setup # 2 Day 0
W.O. # 940225

ASL

RESULTS OF ANALYSIS - Water

File No. E1112

		DAC-HY-1T EL 94 06 09	DAC-HY-2T EL 94 06 09	DAC-HY-26T EL 94 06 09	DAC-HY-5T EL 94 06 09	Control Sediment #1 EL 94 06 09
Nutrients						
Ammonia Nitrogen	N	0.12	0.17	0.20	0.35	0.07
Inorganic Parameters						
Sulphide	S	0.05	0.03	0.03	0.07	<0.02

Remarks regarding the analyses appear at the beginning of this report.
Results are expressed as milligrams per litre.
< = Less than the detection limit indicated.

00710

...CONSOLIDANTS - Neanthes 20-d SEDIMENT TOXICITY TEST

DAILY WATER QUALITY MONITORING

Water Quality Instruments Used

D.O. Meter: II-A-3
pH Meter: II-A-16 #9
Salinity: II-C-12 (YSI)
Temperature: Thermometer

Client: NOAA
EVS Project No.: 9/618-02-4
EVS W.O. No.: 940225
Day 0: ~~May 31/94~~ June 1/94
Day 20: ~~June 20/94~~ June 23/94
Test Species: M. galloprovincialis
Source/Collection Date: Don Kiche May 26/94

Subsample

SAMPLE I.D.	TEMPERATURE (°C)																					SALINITY (ppt)								DISSOLVED OXYGEN (mg/L)								pH							
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	0	3	6	9	12	15	18	20	0	3	6	9	12	15	18	20	0	3	6	9	12	15	18	20
Control Sed #1 A	21	20.5	20.5	20.5	21	21	20	20.5	20	20	20	20	20	20	20°C	20	20	20	20	20	20	29	28	29	29	30	30	31	28	7.4	7.4	6.8	6.8	6.8	6.6	6.7	7.5	7.9	7.8	7.8	8.0	8.0	7.9	8.0	7.9
C	21	20.5	20.5	20.5	21	21	20	20.5	20	20	20	20	20	20	20°C	20	20	20	20	20	20	29	28	27	29	29	29	30	28	7.2	7.4	6.8	6.5	6.7	6.4	6.8	7.2	7.9	7.8	7.9	7.9	7.9	7.9	7.9	7.7
Control Sed #2 B	20.5	20.5	20.5	20.5	21	21	20	20.5	20	20	20	20	20	20	20°C	20	20	20	20	20	20	29	28	28	29	30	30	31	29	6.7	7.6	6.9	6.6	7.0	6.7	6.9	7.3	7.7	7.8	7.7	7.7	8.0	8.0	8.0	7.9
D	20.5	20.5	20.5	20.5	21	21	20	20.5	20	20	20	20	20	20	20°C	20	20	20	20	20	20	29	28	28	29	29	30	31	28	7.2	7.2	6.5	6.4	7.0	6.5	6.7	7.4	7.9	7.6	7.9	7.5	8.0	7.8	7.8	8.0
DAC-Hy-9T A	21	20.5	20.5	20.5	21	21	20	20.5	20	20	20	20	20	20	20°C	20	20	20	20	20	20	28	28	29	28	29	29	31	32	7.2	7.6	6.9	6.8	6.7	6.0	6.9	6.3	7.9	8.0	8.0	7.7	8.1	8.0	8.1	7.9
D	21	20.5	20.5	20.5	21	21	20	20.5	20	20	20	20	20	20	20°C	20	20	20	20	20	20	28	27	29	29	30	30	31	32	7.3	7.6	6.8	6.4	6.7	6.5	7.1	6.2	7.9	8.0	8.0	8.2	8.1	8.1	8.1	8.0
DAC-Hy-7T B	21	20.5	20.5	20.5	21	21	20	20.5	20	20	20	20	20	20	20°C	20	20	20	20	20	20	29	27	29	29	29	29	30	31	7.2	7.6	6.9	6.0	6.5	5.1 (3)	6.6	5.8	7.7	7.9	8.0	7.8	8.0	7.4	7.9	7.4
C	21	20.5	20.5	20.5	21	21	20	20.5	20	20	20	20	20	20	20°C	20	20	20	20	20	20	29	27	30	30	30	29	31	31	7.3	7.6	5.9	6.5	6.5	6.3	6.7	6.2	7.9	7.9	8.0	8.1	8.1	8.1	8.1	7.8
DAC-Hy-12T B	21	20.5	20.5	20.5	21	21	20	20.5	20	20	20	20	20	20	20°C	20	20	20	20	20	20	29	28	30	31	30	30	31	31	7.4	7.0	6.6	5.4	6.7	0.8 (3)	6.9	6.0	7.9	8.0	8.0	7.6	8.0	7.2	7.9	7.7
E	21	20.5	20.5	20.5	21	21	20	20.5	20	20	20	20	20	20	20°C	20	20	20	20	20	20	29	28	30	30	30	30	31	31	7.4	7.3	6.8	6.6	6.9	6.2	7.0	6.2	7.9	7.9	8.0	8.0	8.0	8.0	8.0	7.9
Technician's Initials																																													

Comments/Adjustments Made: Day 3: Salinity (ppt) Control #1, A: 27 Control #1, C: 27 Control #2, B: 27 Control #2, D: 27 ACC
① Aeration off. Adjusted. 9T. ② Increased aeration. DAC-Hy-9T, Rep A June 3 @ 1149 Added June 4/94 DW @ 6.7 & For DAC-Hy-B = 6.4 June
③ Aeration off. Adjusted Re)

Use only black, ball-point pen. Cross out errors with a single line; initial and date corrections. Do not use "White-Out", correcting tape or eraser to make changes.

CONTROL SED #1 GOES WITH DAC-HY-4T, 6T, 7T, 9T, 10T, 12T, 26T, 27T, 28T
CONTROL SED #2 GOES WITH DAC-HY-1T, 2T, 3T, 5T, 8T, 11T, 25T, CR-2T, CR-2T, EED CONTROL

Certified DLG Aug 11, 1994

00035

Dendraster spp. 9/618-02.4 Setup # 2 Day 0
W.O. # 940225

RESULTS OF ANALYSIS - Water

File No. E1112

		DAC-HY-25T EL	DAC-HY-24T EL	DAC-CR-2T EL	DAC-CR-2AT EL	DAC-HY-27T EL
		94 06 09	94 06 09	94 06 09	94 06 09	94 06 09
Nutrients						
Ammonia Nitrogen	N	0.19	0.21	0.45	0.42	0.35
Inorganic Parameters						
Sulphide	S	0.02	0.03	0.08	0.05	0.03

Remarks regarding the analyses appear at the beginning of this report.
Results are expressed as milligrams per litre.
< = Less than the detection limit indicated.

00708

EVS CONSULTANTS - *Neanthes* 20-d SEDIMENT TOXICITY TEST
DAILY WATER QUALITY MONITORING

Page No. 3/4

Water Quality Instruments Used

D.O. Meter IL-A-3
pH Meter IL-A-16 #9
Salinity IL-C-12 (55)
Temperature Thermometer

Client: NOAA
EVS Project No.: 9/618-02-4
EVS W.O. No.: 940225
Day 0: ~~May 31/94~~ Jun 1/94
Day 20: ~~June 20/94~~ Jun 21/94
Test Species: Nereis
Source/Collection Date: Dan Kiehl May 24/94

Subsample

SAMPLE I.D.	TEMPERATURE (°C)																					SALINITY (ppt)								DISSOLVED OXYGEN (mg/L)								pH							
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	0	3	6	9	12	15	18	20	0	3	6	9	12	15	18	20	0	3	6	9	12	15	18	20
DAC-Hy-6T B	20.5	20.5	20.5	20.5	21	21	20.5	20.5	20	20	20	20	20	20	20	20	20	20	20	20	20	29	29	29	28	31	30	31	29	7.3	7.6	6.8	6.7	6.9	6.4	6.3	2.1	7.9	7.9	7.7	8.1	8.1	8.0	8.0	7.5
C	20.5	20.5	20.5	20.5	21	21	20.5	20.5	20	20	20	20	20	20	20	20	20	20	20	20	20	29	29	29	29	31	30	31	29	7.3	7.2	6.6	5.9	6.5	6.0	5.6	4.1	7.9	8.0	7.9	7.9	8.1	8.0	8.0	7.9
DAC-Hy-25T C	20.5	20.5	20.5	20.5	21	21	20.5	20.5	20	20	20	20	20	20	20	20	20	20	20	20	20	29	28	29	30	31	30	31	29	7.2	7.4	6.8	6.7	7.0	6.8	7.0	5.5	7.7	8.1	8.2	8.2	8.0	8.1	7.9	7.7
D	20.5	20.5	20.5	20.5	21	21	20.5	20.5	20	20	20	20	20	20	20	20	20	20	20	20	20	30	29	30	31	31	30	30	30	7.2	7.4	6.7	6.6	6.9	6.7	6.8	2.5	7.9	8.1	7.8	8.1	8.0	8.0	7.9	7.8
DAC-Hy-11T-D	20.5	20.5	20.5	20.5	21	21	20.5	20.5	20	20	20	20	20	20	20	20	20	20	20	20	20	29	29	29	29	29	30	30	30	7.4	7.4	6.8	6.9	7.0	6.2	7.0	6.2	7.7	8.1	8.0	8.1	8.0	8.1	7.9	8.1
E	20.5	20.5	20.5	20.5	21	21	20.5	20.5	20	20	20	20	20	20	20	20	20	20	20	20	20	28	28	29	28	29	29	30	31	7.1	7.4	6.3	6.1	6.7	6.8	6.5	5.5	7.9	7.9	7.9	7.8	8.1	7.7	8.0	8.0
DAC-Hy-8T A	20.5	20.5	20.5	20.5	21	21	20.5	20.5	20	20	20	20	20	20	20	20	20	20	20	20	20	30	28	29	29	30	30	30	29	7.3	7.3	6.8	6.6	6.9	6.6	6.7	5.9	7.8	8.1	8.1	8.2	8.2	8.1	8.0	8.1
C	20.5	20.5	20.5	20.5	21	21	20.5	20.5	20	20	20	20	20	20	20	20	20	20	20	20	20	30	28	29	29	31	30	31	30	7.2	7.2	6.7	6.5	6.9	6.6	6.9	6.0	7.9	8.1	8.0	8.1	8.2	8.2	8.0	8.1
DAC-Hy-5T B	20.5	20.5	20.5	20.5	21	21	20.5	20.5	20	20	20	20	20	20	20	20	20	20	20	20	20	29	27	29	29	30	29	30	31	7.3	7.4	6.8	6.6	6.7	6.6	7.0	6.4	7.9	8.1	7.9	8.0	8.0	8.1	7.9	8.1
C	20.5	20.5	20.5	20.5	21	21	20.5	20.5	20	20	20	20	20	20	20	20	20	20	20	20	20	29	28	29	30	30	30	31	31	7.3	7.4	6.8	6.0	6.6	6.7	7.0	6.3	7.9	8.1	7.9	8.0	8.1	8.0	8.0	8.1
Technician's Initials																																													

Comments/Adjustments Made: ① Aeration off Adjusted. eff. ~~DAC-6T-Day 20 (B)~~ ② Aeration off. Adjusted pers
DAC-Hy-6T-Day20 (B)-2:1 Aeration off in clean Jar.
DAC-Hy-25T " D-2:5 " " " "

Use only black, ball-point pen. Cross out errors with a single line; initial and date corrections. Do not use "White-Out", correcting tape or eraser to make changes.

Certified QC Aug 11, 1994

006

1988 Triumph Street, Vancouver, B.C., Canada V5L 1K5
analytical
service
laboratories
ltd.
FAX: (604) 253-6700 TEL: (604) 253-4188

JUN 27 1994

Dendraster spp. 9/618-02.4
W.O.# 940225

Setup # 2 Day 0

CHEMICAL ANALYSIS REPORT

Date: June 20, 1994

ASL File No. E1112

Report On: 9/618-02.4 Water Analysis

Report To: **EVS Environment Consultants**
195 Pemberton Avenue
North Vancouver, BC
V7P 2R4

Attention: **Mr. Todd Shannon**

Received: June 10, 1994

ASL ANALYTICAL SERVICE LABORATORIES LTD.
per:

Heather A. Ross, B.Sc.
Project Chemist

Katherine Thomas, B.Sc.
Project Chemist

00706

EVS CONSULTANTS - *Neanthes* 20-d SEDIMENT TOXICITY TEST
DAILY WATER QUALITY MONITORING

Page No. 1 Extra

Water Quality Instruments Used

D.O. Meter II-A-3
pH Meter II-A-16 #9
Salinity II-C-12 (SCI)
Temperature Thermometer

Client: NOAA - R&D
EVS Project No.: 9/618-02-4
EVS W.O. No.: 940225
Day 0: March 5/94 June 3/94 Part #2
Day 20: June 20/94 June 23/94
Test Species: Nereis
Source/Collection Date: Dan Fidler May 24/94

R&D. Subpopt 2

SAMPLE I.D.	TEMPERATURE (°C)																					SALINITY (ppt)								DISSOLVED OXYGEN (mg/L)								pH							
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	0	3	6	9	12	15	18	20	0	3	6	9	12	15	18	20	0	3	6	9	12	15	18	20
R&D Control 2 A	19.5	21	20.5	20.5	21	21	20.5	20.5	20	20	20	20	20	20	19.9	20	20	20	20	20	20	28	28	29	27	29	28	29	27	7.6	7.2	7.0	6.9	6.9	6.5	6.7	7.4	7.8	7.9	7.8	7.4	7.9	7.9	7.8	7.9
B	19.5	21	20.5	20.5	21	21	20.5	20.5	20	20	20	20	20	20	19.9	20	20	20	20	20	20	29	29	29	28	30	29	30	28	7.6	7.2	7.0	6.2	6.6	6.5	6.6	7.4	7.9	7.9	7.8	7.3	7.9	8.0	7.9	7.9
Technician's Initials																																												

Comments/Adjustments Made: ① adjusted aeration rate R&D Control 2 rep A - DO 4.1 on June 12 - Aquarium air line - DO at 6.6 on June 13/94

Use only black, ball-point pen. Cross out errors with a single line; initial and date corrections. Do not use "White-Out", correcting tape or eraser to make changes.

Certified DLC Aug 11, 1994

0089

ECHINODERM LARVAL DEVELOPMENT TOXICITY TEST – 48 h

Client:	NOAA	Date Initiated:	June 9, 1994
Project Number:	9/618–02.4	Date Terminated:	June 11, 1994
Work Order Number:	940225	Termination Method:	Direct pipette
Test Species:	*Dendraster excentricus*	Initial Density:	18500 embryos/L
Book: 5 Page: 45		Aliquot Size (mL):	10
		Test Volume (mL):	1000

Sample ID	Rep/ Conc	pH	D.O. (mg/L)	Temperature (°C)	Salinity (ppt)
Control Sediment 1	A	7.6	7.8	16.0	31
	B	7.6	7.8	16.0	31
	C	7.6	7.8	16.0	31
	D	7.6	7.7	16.0	31
	E	7.6	7.8	16.0	31
	WQ	7.6	7.7	16.0	31
Control Sediment 2	A	7.4	7.1	16.0	31
	B	7.6	7.4	16.0	31
	C	7.4	7.0	16.0	31
	D	7.6	7.5	16.0	31
	E	7.7	7.6	16.0	31
	WQ	7.7	7.6	16.0	31
Control Seawater 1	A	7.5	7.7	16.0	30
	B	7.6	7.8	16.0	30
	C	7.5	7.8	16.0	30
	D	7.5	7.8	16.0	30
	E	7.5	7.8	16.0	30
	WQ	7.4	7.5	16.0	30
Control Seawater 2	A	7.5	7.6	16.0	31
	B	7.7	7.6	16.0	31
	C	7.7	7.7	16.0	31
	D	7.7	7.7	16.0	31
	E	7.7	7.7	16.0	31
	WQ	7.5	7.6	16.0	30

00704

Certified by: Blander
Jan. 6/95

LC50:STEPHEN IBM/AT VERS 1.0

FILE: NOAA 9/618-02.4 940225

TEST: Reference Toxicant DATE: June 3, 1994
SPECIES: Neanthes arenaceodentata DURATION: 96 hr
CHEMICAL: Cadminum
CARRIER: Seawater CARRIER CONC: 28 ppt

Sample: Reference Toxicant

Conc	Number exposed	Number dead	Percent dead	Binomial prob(percent)
32.00	10	10	100.0	0.0977
18.00	10	10	100.0	0.0977
10.00	10	10	100.0	0.0977
5.60	10	2	20.0	5.4687
3.20	10	0	0.0	0.0977
1.80	10	0	0.0	0.0977

The binom test shows that 3.200 and 10.000 can be used as statistically sound at 95 conf since the actual conf level associated with these limits is 99.805

An approx LC50 is 6.721 ~, ng/L

* warning:probit/mov av fail to give statsound results *
Less than 2 conc where %dead between 0-100

00641 Certified LC Aug 11, 1994

CHINODERM LARVAL DEVELOPMENT TOXICITY TEST – 48 h

lient:	NOAA	Date Initiated:	June 9, 1994
roject Number:	9/618–02.4	Date Terminated:	June 11, 1994
ork Order Number:	940225	Termination Method:	Direct pipette
st Species:	*Dendraster excentricus*	Initial Density:	18500 embryos/L
ook: 5 Page: 45		Aliquot Size (mL):	10
		Test Volume (mL):	1000

Sample ID	Rep/ Conc	pH	D.O. (mg/L)	Temperature (°C)	Salinity (ppt)
AC–HY–6T	A	7.5	6.6	16.0	31
	B	7.8	7.3	16.0	31
	C	7.7	7.5	16.0	31
	D	7.7	7.5	16.0	31
	E	7.8	7.6	16.0	31
	WQ	7.8	7.4	16.0	31
AC–HY–7T	A	7.6	7.6	16.0	31
	B	7.6	7.7	16.0	31
	C	7.6	7.6	16.0	31
	D	7.7	7.6	16.0	31
	E	7.7	7.6	16.0	31
	WQ	7.6	7.5	16.0	31
AC–HY–14T	A	7.5	7.6	16.0	31
	B	7.3	7.5	16.0	31
	C	7.2	7.1	16.0	31
	D	7.1	6.2	16.0	31
	E	7.3	7.2	16.0	31
	WQ	7.5	7.6	16.0	31
AC–HY–24T	A	7.5	7.6	16.0	30
	B	7.7	7.4	16.0	31
	C	7.7	7.6	16.0	30
	D	7.6	7.6	16.0	30
	E	7.6	7.6	16.0	30
	WQ	7.6	7.6	16.0	30
AC–HY–25T	A	7.6	7.6	16.0	31
	B	7.7	7.6	16.0	31
	C	7.6	7.5	16.0	31
	D	7.6	7.5	16.0	31
	E	7.3	5.9	16.0	31
	WQ	7.6	7.7	16.0	31

00702

certified by: Blanden
Jan. 6 1995

Nearthes 9/018-02.4
W.O.# 940225

ASL

Setup #2, Day 0

RESULTS OF ANALYSIS - Water

File No. D9893

		DAC-HY-4T	DAC-HY-4TN	DAC-HY-5T	DAC-HY-5TN	DAC-HY-6T
		94 06 02	94 06 02	94 06 02	94 06 02	94 06 02
Nutrients						
Ammonia Nitrogen	N	0.690	0.860	0.930	0.840	0.580
Inorganic Parameters						
Sulphide	S	<0.02	<0.02	<0.02	<0.02	<0.02

Results are expressed as milligrams per litre.
< = Less than the detection limit indicated.

00643

ECHINODERM LARVAL DEVELOPMENT TOXICITY TEST – 24 h

Client:	NOAA	Date Initiated:	June 9, 1994
Project Number:	0/618–02.4	Date Terminated:	June 11, 1994
Work Order Number:	940225	Termination Method:	Direct pipette
Test Species:	*Dendraster excentricus*	Initial Density:	18500 embryos/L
Book: 5 Page: 45		Aliquot Size (mL):	10
		Test Volume (mL):	1000

Sample ID	Rep/ Conc	pH	D.O. (mg/L)	Temperature (°C)	Salinity (ppt)
DAC–HY–1T	WQ	7.8	8.1	16.0	31
DAC–HY–2T	WQ	7.6	8.0	16.0	31
DAC–HY–3T	WQ	7.6	7.0	16.0	31
DAC–HY–4T	WQ	7.5	7.4	16.0	31
DAC–HY–5T	WQ	7.7	8.0	16.0	00
DAC–HY–6T	WQ	7.8	7.9	16.0	31
DAC–HY–7T	WQ	7.7	7.8	16.0	31
DAC–HY–14T	WQ	7.8	8.0	16.0	31
DAC–HY–24T	WQ	7.5	7.8	16.0	31
DAC–HY–25T	WQ	7.7	7.9	16.0	31
DAC–HY–26T	WQ	7.8	8.0	16.0	30
DAC–HY–27T	WQ	7.6	7.8	16.0	31
DAC–HY–28T	WQ	7.6	7.8	16.0	31
DAC–CR–2AT	WQ	7.6	8.0	16.0	31
DAC–CR–2T	WQ	7.7	7.8	16.0	30
Control Sediment 1	WQ	7.7	8.0	16.0	31
Control Sediment 2	WQ	7.6	7.4	16.0	31
Control Seawater 1	WQ	7.6	8.0	16.0	30
Control Seawater 2	WQ	7.6	7.0	16.0	30
Reference Toxicant (SDS in mg/L)	WQ 10.0	7.8	8.0	16.0	31
	WQ 5.6	7.8	8.0	16.0	31
	WQ 3.2	7.7	8.0	16.0	31
	WQ 1.8	7.7	8.0	16.0	31
	WQ 1.0	7.7	8.0	16.0	31

00700

certified by: Blander
Jan 6/95

Neanthes 9/618-02 A
W.O. # 940225

Setup #2 Day 2

RESULTS OF ANALYSIS - Water

File No. D9893

		DAC-HY-9T	DAC-HY-9TN	DAC-HY-10T	DAC-HY-10TN	DAC-HY-11T
		94 06 02	94 06 02	94 06 02	94 06 02	94 06 02
Nutrients						
Ammonia Nitrogen	N	0.680	0.730	0.710	0.720	0.580
Inorganic Parameters						
Sulphide	S	<0.02	<0.02	<0.02	<0.02	0.02

Results are expressed as milligrams per litre.
< = Less than the detection limit indicated.

00645

LC50:STEPHEN IBM/AT VERS 1.0

FILE: 9/618-02.4 940225 NOAA

TEST: Abnormality - EC50 DATE: June 9, 1994
SPECIES: Dendraster excentricus DURATION: 48 hr
CHEMICAL: SDS
CARRIER: Seawater CARRIER CONC: 30 ppt

Conc	Number exposed	Number dead	Percent dead	Binomial prob(percent)
10.00	100	59	59.3	2.8444
5.60	100	9	8.5	less
3.20	100	15	14.8	less
1.80	100	0.	0.3	less
1.00	100	0	0.0	less

*WARNING: no percent dead is greater then 65 *

The binom test shows that 5.600 and +infinity can be used as statistically sound at 95 conf since the actual conf level associated with these limits is 100.000

An approx LC50 is 9.108 mg/L SDS

------RESULTS USING THE MOVING AVERAGE METHOD----------

span	g	lc50	95% conf limits	
1	0.057810	9.108	8.446	10.063

-------RESULTS USING THE PROBIT METHOD----------

iterations	g	h	p(good. of fit)
8	1.0708	8.388	0.000

a prob of 0 means that is less than 0.001
* probit warning: prob is less than .05 *

slope= 3.150
95 confidence limits= -0.110 and 6.409

lc50= 9.560
95 confidence limits= 5.484 and infinity

lc1= 1.745
95 confidence limits= 0 and 3.683

00698

certified by: B Lancaster
Jan 16 195

Heanthes 9/618-02.4
W.O.# 940225

Setup #2 Day 0

RESULTS OF ANALYSIS - Water

File No. D9893

		DAC-HY-26T	DAC-HY-26TN	DAC-HY-27T	DAC-HY-27TN	DAC-HY-28T
		94 06 02	94 06 02	94 06 02	94 06 02	94 06 02
Nutrients						
Ammonia Nitrogen	N	0.590	0.750	0.600	0.700	0.740
Inorganic Parameters						
Sulphide	S	<0.02	0.03	<0.02	<0.02	<0.02

Results are expressed as milligrams per litre.
< = Less than the detection limit indicated.

00647

[illegible] toxicity test using [illegible]

QA/QC Summary Sheet

Client : ~~NOSS~~ NOAA

Project No. : 9/618-02.4

Work Order. : 940225

Summary of sediment toxicity test results. Setup #2

Sample I.D.	Mean Value ~~± S.D.~~ % Abn. ~~Survival~~	% Mort. ~~Dry Weight~~	% Comb. Mort.
CONTROL S.W. #2	4.7	-11.0	-5.8
CONTROL SED. #2	5.6	-9.4	-3.2
DACHY-1T	8.0	-9.3	-0.5
DAC-HY-~~2~~ 3T	9.6	5.6	14.7
DAC-HY-4T	4.2	17.8	21.3
DAC-HY-6T	8.8	4.9	13.2
DAC-HY-7T	7.4	6.6	13.5
DAC-HY-14T	4.2	8.2	12.1
DAC-HY-25T	9.8	29.7	36.6
DAC-HY-27T	9.8	25.8	33.1
DAC-HY-28T	3.4	7.8	10.9

WATER QUALITY PARAMETERS: (Reftox 0,24+48-h)

Dissolved Oxygen : 5.0-8.0 mg/L

pH : 7.0-7.8

~~Conductivity~~ Salinity : 29-31 ppt

Temperature : 16-17 °C

LC50 ~~(48h, 96h)~~ ~~(Cd, Zn)~~ :

Ammonia

Day 0: 0.02-0.45 mg/L

48-h: ~~<~~0.36-0.05 mg/L

Sulfide:

Day 0: <0.02-0.10 mg/L

48-h: <0.02 mg/L

certified by

00696

Neanthes 9/618-02.4 W.O. # 9/40225

ASL

Setup #2 Day 0

RESULTS OF ANALYSIS - Water

File No. D9893

		DAC-HY-3T	DAC-HY-3TN	DAC-HY-2T	DAC-HY-2TN	DAC-HY-1T
		94 06 02	94 06 02	94 06 02	94 06 02	94 06 02
Nutrients						
Ammonia Nitrogen	N	0.480	0.570	0.260	0.190	0.130
Inorganic Parameters						
Sulphide	S	<0.02	<0.02	<0.02	<0.02	<0.02

Results are expressed as milligrams per litre.
< = Less than the detection limit indicated.

00649

ECHINODERM LARVAL DEVELOPMENT TOXICITY TEST RAW DATA RECORD

Client: NOAA
Project Number: 9/618-02.4
Work Order Number: 940225
Test Species: *Dendraster excentricus*
Book: 5 Page: 45

Date Initiated: June 9, 1994
Date Terminated: June 11, 1994
Termination Method: Direct pipette
Initial Density (embryos/L): 18500
Aliquot Size (mL): 10
Test Volume (mL): 1000

Sample ID	Rep/ Conc	Normal Larvae	Abnormal Larvae	Total Larvae	% Abnormal Larvae	Mean % Abnormal	Mean Net % Abnormal	% Mortality	Mean % Mortality	% Combined Mortality	Mean % Combined Mortality
DAC-HY-25T	A	112	14	126	11.1	9.8	NA	31.9	29.7	39.5	36.6
	B	124	6	130	4.6			29.7		33.0	
	C	108	19	127	15.0			31.4		41.6	
	D	116	14	130	10.8			29.7		37.3	
	E	126	11	137	8.0			25.9		31.9	
DAC-HY-27T	A	108	22	130	16.9	9.8	NA	29.7	25.8	41.6	33.1
	B	132	21	153	13.7			17.3		28.6	
	C	129	11	140	7.9			24.3		30.3	
	D	140	6	146	4.1			21.1		24.3	
	E	110	7	117	6.0			36.8		40.5	
DAC-HY-28T	A	157	5	162	3.1	3.4	NA	12.4	7.8	15.1	10.9
	B	208	8	216	3.7			-16.8		-12.4	
	C	199	8	207	3.9			-11.9		-7.6	
	D	134	5	139	3.6			24.9		27.6	
	E	126	3	129	2.3			30.3		31.9	

NA – Not Applicable

00694

certified by: Blander
Jan. 6/95

9618024\0225ldbwk1

Neanthes 9/618-024
W.O.# 940225

Bckg #2 Day 0

METHODOLOGY File No. D9893

Samples were analyzed by methods acceptable to the appropriate regulatory agency. Outlines of the methodologies utilized are as follows:

Conventional Parameters in Water

These analyses are carried out in accordance with procedures described in "Standard Methods for the Examination of Water and Wastewater" 18th Ed. published by the American Public Health Association, 1992. Further details are available on request.

End of Report

00651

ECHINODERM LARVAL DEVELOPMENT TOXICITY TEST RAW DATA RECORD

Client:	NOAA	Date Initiated:	June 9, 1994
Project Number:	9/618–02.4	Date Terminated:	June 11, 1994
Work Order Number:	940225	Termination Method:	Direct pipette
Test Species:	*Dendraster excentricus*	Initial Density (embryos/L):	18500
Book: 5 Page: 45		Aliquot Size (mL):	10
		Test Volume (mL):	1000

Sample ID	Rep/ Conc	Normal Larvae	Abnormal Larvae	Total Larvae	% Abnormal Larvae	Mean % Abnormal	Mean Net % Abnormal	% Mortality	Mean % Mortality	% Combined Mortality	Mean % Combined Mortality
Control	A	173	8	181	4.4	4.7	NA	2.2	−11.0	6.5	−5.8
Seawater 2	B	207	14	221	6.3			−19.5		−11.9	
	C	200	8	208	3.8			−12.4		−8.1	
	D	192	9	201	4.5			−8.6		−3.8	
	E	207	9	216	4.2			−16.8		−11.9	
Control	A	195	12	207	5.8	5.6	NA	−11.9	−9.4	−5.4	−3.2
Sediment 2	B	168	11	179	6.1			3.2		9.2	
	C	216	12	228	5.3			−23.2		−16.8	
	D	179	8	187	4.3			−1.1		3.2	
	E	197	14	211	6.6			−14.1		−6.5	
DAC−HY−1T	A	197	14	211	6.6	8.0	NA	−14.1	−9.3	−6.5	−0.5
	B	172	11	183	6.0			1.1		7.0	
	C	181	23	204	11.3			−10.3		2.2	
	D	190	15	205	7.3			−10.8		−2.7	
	E	190	18	208	8.7			−12.4		−2.7	
DAC−HY−3T	A	145	17	162	10.5	9.6	NA	12.4	5.6	21.6	14.7
	B	189	13	202	6.4			−9.2		−2.2	
	C	130	16	146	11.0			21.1		29.7	
	D	158	23	181	12.7			2.2		14.6	
	E	167	15	182	8.2			1.6		9.7	

NA – Not Applicable

00692

96:8024\0225ldt.wk1

certified by: Blander
Tool Ice

Neanthes 9/618-02.4
W.O.# 9H0225

Setup #2 Day 20

REMARKS

File No. E1482

As per the sample submission form, these samples are identified as "20 day Neaathis June 23, 1994 Teardown".

00653

ECHINODERM LARVAL DEVELOPMENT TOXICITY TEST RAW DATA RECORD

Client: NOAA
Project Number: 9/618–02.4
Work Order Number: 940225
Test Species: *Dendraster excentricus*
Book: 5 Page: 45

Date Initiated: June 9, 1994
Date Terminated: June 11, 1994
Termination Method: Direct pipette
Initial Density (embryos/L): 18500
Aliquot Size (mL): 10
Test Volume (mL): 1000

Sample ID	Rep/ Conc	Normal Larvae	Abnormal Larvae	Total Larvae	% Abnormal Larvae	Mean % Abnormal	Mean Net % Abnormal	% Mortality	Mean % Mortality	% Combined Mortality	Mean % Combined Mortality
Control	A	193	7	200	3.5	2.7	NA	−8.1	−10.1	−4.3	−7.1
Seawater 1	B	182	7	189	3.7			−2.2		1.6	
	C	183	7	190	3.7			−2.7		1.1	
	D	216	3	219	1.4			−18.4		−16.8	
	E	217	3	220	1.4			−18.9		−17.3	
Control	A	169	6	175	3.4	5.0	NA	5.4	−6.5	8.6	−1.2
Sediment 1	B	184	14	198	7.1			−7.0		0.5	
	C	194	10	204	4.9			−10.3		−4.9	
	D	199	12	211	5.7			−14.1		−7.6	
	E	190	7	197	3.6			−6.5		−2.7	
DAC−HY−2T	A	189	15	204	7.4	8.5	NA	−10.3	−6.3	−2.2	2.8
	B	201	14	215	6.5			−16.2		−8.6	
	C	174	15	189	7.9			−2.2		5.9	
	D	166	17	183	9.3			1.1		10.3	
	E	169	23	192	12.0			−3.8		8.6	
DAC−HY−5T	A	168	14	182	7.7	8.8	NA	1.6	6.4	9.2	14.6
	B	160	14	174	8.0			5.9		13.5	
	C	148	21	169	12.4			8.6		20.0	
	D	140	13	153	8.5			17.3		24.3	
	E	174	14	188	7.4			−1.6		5.9	

NA – Not Applicable

00690

9613024\0225ldb.wk1

Certified by: Blander

Neanthes 9/1018-02.4
W.O.# 940225

Setup #2 Daytp

RESULTS OF ANALYSIS - Water

File No. E1482

		DAC-HY-26T N	DAC-HY-4T N	DAC-HY-10T N	DAC-HY-28T N	DAC-HY-27T N
		94 06 23	94 06 23	94 06 23	94 06 23	94 06 23
Nutrients						
Ammonia Nitrogen	N	5.21	0.540	0.910	5.23	4.31
Inorganic Parameters						
Sulphide	S	<0.02	<0.02	<0.02	<0.02	<0.02

Remarks regarding the analyses appear at the beginning of this report.
Results are expressed as milligrams per litre.
< = Less than the detection limit indicated.

00655

Echinoderm 11018-02-7
W.O. # 940225

Setup # 1 48-h

ASL

RESULTS OF ANALYSIS - Water

File No. E1143

		Control Sediment #1 EL 94 06 10	Control Sediment #2 EL 94 06 10	Control Seawater #1 EL 94 06 10	Control Seawater #2 EL 94 06 10
Nutrients					
Ammonia Nitrogen	N	0.24	0.29	0.15	0.14
Inorganic Parameters					
Sulphide	S	<0.02	<0.02	<0.02	0.02

Remarks regarding the analyses appear at the beginning of this report.
Results are expressed as milligrams per litre.
< = Less than the detection limit indicated.

00688

Neanthes 9/6018-02.4 Setup #2 Day 20
W.O.# 940225

RESULTS OF ANALYSIS - Water

File No. E1482

		DAC-HY-1T N	DAC-HY-2T N	DAC-HY-3T N	DAC-CR-2T N	DAC-CR-2AT N
		94 06 23	94 06 23	94 06 23	94 06 23	94 06 23
Nutrients						
Ammonia Nitrogen	N	0.143	0.126	1.00	1.76	0.180
Inorganic Parameters						
Sulphide	S	<0.02	<0.02	<0.02	<0.02	<0.02

Remarks regarding the analyses appear at the beginning of this report.
Results are expressed as milligrams per litre.
< = Less than the detection limit indicated.

00657

Echinoderm 9/618-UCA
W.O. # 940225

Setup # 1 48-L

ASL

RESULTS OF ANALYSIS - Water

File No. E1143

		DAC-HY-8T EL	DAC-HY-13T EL	DAC-HY-12T EL	DAC-HY-11T EL	DAC-HY-22T EL
		94 06 10	94 06 10	94 06 10	94 06 10	94 06 10
Nutrients						
Ammonia Nitrogen	N	0.34	0.19	0.24	0.24	0.35
Inorganic Parameters						
Sulphide	S	<0.02	0.02	<0.02	<0.02	<0.02

Remarks regarding the analyses appear at the beginning of this report.
Results are expressed as milligrams per litre.
< = Less than the detection limit indicated.

00686

APPENDIX C
Echinoderm Larvae Bioassay
RAW DATA

PRIVILAGED ATTORNEY WORK PRODUCT - FOIA EXEMPT - DO NOT DISCLOSE

Echinoderm 41018-U2.4
W.O. # 940225

Setup "1 48-h

REMARKS

File No. E1143

As indicated on the sample submission form, these samples are identified as "Day 48-h Teardown (June 10, 1994), Echinoderm Larval".

00684

ECHINODERM LARVAL DEVELOPMENT TOXICITY TEST RAW DATA RECORD

Client: NOAA
Project Number: 9/618-02.4
Work Order Number: 940225
Test Species: *Dendraster excentricus*
Book: 5 Page: 39

Date Initiated: June 8, 1994
Date Terminated: June 10, 1994
Termination Method: Direct pipette
Initial Density (embryos/L): 15400
Aliquot Size (mL): 10
Test Volume (mL): 1000

Sample ID	Rep/ Conc	Normal Larvae	Abnormal Larvae	Total Larvae	% Abnormal Larvae	Mean % Abnormal	Mean Net % Abnormal	% Mortality	Mean % Mortality	% Combined Mortality	Mean % Combined Mortality
DAC-HY-10T	A	111	9	120	7.5	8.7	NA	22.1	26.5	27.9	32.9
	B	118	11	129	8.5			16.2		23.4	
	C	94	13	107	12.1			30.5		39.0	
	D	95	9	104	8.7			32.5		38.3	
	E	99	7	106	6.6			31.2		35.7	
DAC-HY-11T	A	132	6	138	4.3	3.2	NA	10.4	17.9	14.3	20.5
	B	113	5	118	4.2			23.4		26.6	
	C	105	2	107	1.9			30.5		31.8	
	D	132	3	135	2.2			12.3		14.3	
	E	130	4	134	3.0			13.0		15.6	
DAC-HY-12T	A	120	3	123	2.4	4.5	NA	20.1	8.2	22.1	12.3
	B	162	10	172	5.8			-11.7		-5.2	
	C	138	7	145	4.8			5.8		10.4	
	D	121	9	130	6.9			15.6		21.4	
	E	134	3	137	2.2			11.0		13.0	
DAC-HY-13T	A	113	10	123	8.1	8.4	NA	20.1	19.7	26.6	26.5
	B	126	8	134	6.0			13.0		18.2	
	C	109	7	116	6.0			24.7		29.2	
	D	94	8	102	7.8			33.8		39.0	
	E	124	19	143	13.3			7.1		19.5	

NA – Not Applicable

00661

certified by: Blander
Jan. 6/95

9618024\940225H.wk1

Echinoderm 4/1618-02-4
W.O.# 940225

Setup # 1 Day 0

METHODOLOGY

File No. E1113

Samples were analyzed by methods acceptable to the appropriate regulatory agency. Outlines of the methodologies utilized are as follows:

Conventional Parameters in Water

These analyses are carried out in accordance with procedures described in "Standard Methods for the Examination of Water and Wastewater" 18th Ed. published by the American Public Health Association, 1992. Further details are available on request.

End of Report

00682

ECHINODERM LARVAL DEVELOPMENT TOXICITY TEST – 0 h

Client:	NOAA	Date Initiated:	June 8, 1994
Project Number:	9/618–02.4	Date Terminated:	June 10, 1994
Work Order Number:	940225	Termination Method:	Direct pipette
Test Species:	*Dendraster excentricus*	Initial Density:	15400 embryos/L
Book: 5 Page: 39		Aliquot Size (mL):	10
		Test Volume (mL):	1000

Sample ID	Rep/ Conc	pH	D.O. (mg/L)	Temperature (°C)	Salinity (ppt)
DAC–HY–6T	WQ	7.7	5.8	15.0	30
DAC–HY–9T	WQ	7.7	6.0	16.0	31
DAC–HY–10T	WQ	7.9	5.4	15.0	31
DAC–HY–11T	WQ	7.7	6.2	15.0	30
DAC–HY–12T	WQ	7.7	5.8	15.0	31
DAC–HY–13T	WQ	7.7	6.4	15.0	30
DAC–HY–15T	WQ	7.6	5.7	15.5	31
DAC–HY–16T	WQ	7.7	5.4	15.0	31
DAC–HY–17T	WQ	7.7	6.2	15.0	32
DAC–HY–18T	WQ	7.6	5.2	15.0	31
DAC–HY–19T	WQ	7.6	5.4	15.0	32
DAC–HY–20T	WQ	7.6	5.4	15.0	32
DAC–HY–21T	WQ	7.7	5.2	15.0	31
DAC–HY–22T	WQ	7.7	5.2	15.0	32
DAC–HY–23T	WQ	7.6	5.0	15.0	31
Control Sediment 1	WQ	7.6	7.3	15.0	31
Control Sediment 2	WQ	7.6	7.2	15.0	30
Control Seawater 1	WO	7.7	7.7	15.0	30
Control Seawater 2	WQ	7.7	7.8	15.0	30
Reference Toxicant (SDS in mg/L)	WQ 10.0	7.6	7.4	16.5	32
	WQ 5.6	7.6	7.5	16.5	32
	WQ 3.2	7.6	7.4	16.5	32
	WQ 1.8	7.6	7.4	16.5	31
	WQ 1.0	7.6	7.5	16.5	30

00669

Certified by: Standard

Echinoderm 7/6 18 02.4
W.O. # ~~7/6 18~~ 940225

Setup # 21 Day 0

ASL

RESULTS OF ANALYSIS - Water

File No. E1113

		DAC-HY-21T EL	DAC-HY-19T EL	DAC-HY-17T EL	DAC-HY-18T EL	DAC-HY-20T EL
		94 06 08	94 06 08	94 06 08	94 06 08	94 06 08
Nutrients						
Ammonia Nitrogen	N	0.22	0.28	0.10	0.25	0.23
Inorganic Parameters						
Sulphide	S	0.02	<0.02	<0.02	<0.02	<0.02

Remarks regarding the analyses appear at the beginning of this report.
Results are expressed as milligrams per litre.
< - Less than the detection limit indicated.

00600

ECHINODERM LARVAL DEVELOPMENT TOXICITY TEST – 48 h

Client:	NOAA	Date Initiated:	June 8, 1994
Project Number:	9/618–02.4	Date Terminated:	June 10, 1994
Work Order Number:	940225	Termination Method:	Direct pipette
Test Species:	*Dendraster excentricus*	Initial Density:	15400 embryos/L
Book: 5 Page: 39		Aliquot Size (mL):	10
		Test Volume (mL):	1000

Sample ID	Rep/ Conc	pH	D.O. (mg/L)	Temperature (°C)	Salinity (ppt)
DAC–HY–13T	A	7.5	8.0	16.0	30
	B	7.4	8.0	16.0	30
	C	7.4	7.8	16.0	30
	D	7.6	8.0	16.0	30
	E	7.7	8.0	16.0	30
	WQ	7.5	8.0	16.0	30
DAC–HY–15T	A	7.5	7.8	16.0	29
	B	7.5	7.9	16.0	29
	C	7.4	7.8	16.0	29
	D	7.5	7.8	16.0	29
	E	7.5	7.8	16.0	29
	WQ	7.4	7.8	16.0	29
DAC–HY–16T	A	7.5	7.9	16.0	30
	B	7.5	8.0	16.0	30
	C	7.5	8.0	16.0	30
	D	7.4	8.0	16.0	30
	E	7.4	7.8	16.0	30
	WQ	7.5	7.9	16.0	30
DAC–HY–17T	A	7.4	7.8	16.0	29
	B	7.5	7.6	16.0	29
	C	7.5	7.9	16.0	29
	D	7.5	7.8	16.0	29
	E	7.5	7.8	16.0	29
	WQ	7.6	8.0	16.0	29
DAC–HY–18T	A	7.5	7.8	16.0	29
	B	7.5	7.8	16.0	29
	C	7.4	5.8	16.0	29
	D	7.4	6.8	16.0	29
	E	7.3	5.8	16.0	29
	WQ	7.5	7.7	16.0	29

00673

Certified by: Blamir

B:\9618024\225aWQ48.wk1

Echinoderm 9/618-02.4 Setup#1 Day 0
W.O. # 940225

RESULTS OF ANALYSIS - Water

File No. E1113

		DAC-HY-9T EL	DAC-HY-15T EL	DAC-HY-23T EL	DAC-HY-16T EL	DAC-HY-10T EL
		94 06 08	94 06 08	94 06 08	94 06 08	94 06 08
Nutrients						
Ammonia Nitrogen	N	0.21	0.21	0.23	0.12	0.17
Inorganic Parameters						
Sulphide	S	0.03	0.04	<0.02	0.02	0.02

Remarks regarding the analyses appear at the beginning of this report.
Results are expressed as milligrams per litre.
< = Less than the detection limit indicated.

00678

ECHINODERM LARVAL DEVELOPMENT TOXICITY TEST – 48 h

Client:	NOAA	Date Initiated:	June 8, 1994
Project Number:	9/618–02.4	Date Terminated:	June 10, 1994
Work Order Number:	940225	Termination Method:	Direct pipette
Test Species:	*Dendraster excentricus*	Initial Density:	15400 embryos/L
Book: 5 Page: 39		Aliquot Size (mL):	10
		Test Volume (mL):	1000

Sample ID	Rep/ Conc	pH	D.O. (mg/L)	Temperature (°C)	Salinity (ppt)
Reference Toxicant (SDS in mg/L)	A 10.0	7.5	8.0	16.0	31
	B	7.5	8.0	16.0	31
	WQ	7.5	8.0	16.0	31
	A 5.6	7.4	8.0	16.0	31
	B	7.5	8.0	16.0	31
	WQ	7.4	8.0	16.0	31
	A 3.2	7.4	8.0	16.0	31
	B	7.5	8.0	16.0	31
	WQ	7.3	8.0	16.0	31
	A 1.8	7.3	8.0	16.0	31
	B	7.3	8.0	16.0	31
	WQ	7.3	8.0	16.0	31
	A 1.0	7.3	8.0	16.0	31
	B	7.3	8.0	16.0	31
	WQ	7.3	8.0	16.0	31

00675

Certified by: Blander
Jan 6/95

B:\9618024\225aWQ48.wk1

1988 Triumph Street, Vancouver, B.C., Canada V5L 1K5
analytical service laboratories ltd.
FAX: (604) 253-6700 TEL: (604) 253-4188

Echinoderm 9/618-02.4
W.O. # 940225

Setup #1 Day 0

CHEMICAL ANALYSIS REPORT

Date: June 20, 1994

ASL File No. E1113

Report On: 9/618-02.4 Water Analysis

Report To: **EVS Environment Consultants**
195 Pemberton Avenue
North Vancouver, BC
V7P 2R4

Attention: **Mr. Todd Shannon**

Received: June 10, 1994

ASL ANALYTICAL SERVICE LABORATORIES LTD.
per:

Heather A. Ross, B.Sc.
Project Chemist

Katherine Thomas, B.Sc.
Project Chemist

00676

Echinoderm 4/6/18-02-1
W.O.# 940225

Setup #1 Day 0

REMARKS

File No. E1113

As indicated on the sample submission form, these samples are identified as "Day 0, Set up #1 (June 8, 1994), Echinoderm Larval".

00677

ECHINODERM LARVAL DEVELOPMENT TOXICITY TEST – 48 h

Client:	NOAA	Date Initiated:	June 8, 1994
Project Number:	9/618–02.4	Date Terminated:	June 10, 1994
Work Order Number:	940225	Termination Method:	Direct pipette
Test Species:	*Dendraster excentricus*	Initial Density:	15400 embryos/L
Book: 5 Page: 39		Aliquot Size (mL):	10
		Test Volume (mL):	1000

Sample ID	Rep/ Conc	pH	D.O. (mg/L)	Temperature (°C)	Salinity (ppt)
AC–HY–19T	A	7.4	7.8	16.5	29
	B	7.4	6.6	16.0	29
	C	7.4	7.6	16.0	29
	D	7.4	7.2	16.0	29
	E	7.4	6.4	16.0	30
	WQ	7.4	7.8	16.0	30
AC–HY–20T	A	7.4	7.6	16.0	29
	B	7.3	5.8	16.0	29
	C	7.3	5.6	16.0	29
	D	7.3	5.6	16.0	29
	E	7.5	5.8	16.0	29
	WQ	7.6	8.0	16.0	29
AC–HY–21T	A	7.5	7.8	16.5	29
	B	7.5	7.8	16.5	29
	C	7.5	8.0	16.0	29
	D	7.6	7.9	16.0	29
	E	7.3	6.4	16.0	29
	WQ	7.6	7.8	16.0	29
AC–HY–22T	A	7.5	7.9	16.0	30
	B	7.3	5.9	16.5	30
	C	7.3	7.1	16.5	30
	D	7.4	7.4	16.5	30
	E	7.4	7.6	16.5	30
	WQ	7.6	8.0	16.5	30
AC–HY–23T	A	7.5	7.8	16.0	29
	B	7.5	7.8	16.0	29
	C	7.3	6.2	16.0	29
	D	7.3	6.6	16.0	29
	E	7.4	7.0	16.0	29
	WQ	7.5	8.0	16.0	29

00674

Certified by: Blander
Jan. 6 1995

Echinoderm 41618-02.4
W.O.# 940225

Setup # 1 Day 0

ASL

RESULTS OF ANALYSIS - Water **File No. E1113**

		DAC-HY-8T EL	DAC-HY-13T EL	DAC-HY-12T EL	DAC-HY-11T EL	DAC-HY-22T EL
		94 06 08	94 06 08	94 06 08	94 06 08	94 06 08
Nutrients						
Ammonia Nitrogen	N	0.21	0.11	0.14	0.17	0.24
Inorganic Parameters						
Sulphide	S	<0.02	0.02	0.03	<0.02	<0.02

Remarks regarding the analyses appear at the beginning of this report.
Results are expressed as milligrams per litre.
< - Less than the detection limit indicated.

00679

CHINODERM LARVAL DEVELOPMENT TOXICITY TEST – 48 h

lient:	NOAA	Date Initiated:	June 8, 1994
roject Number:	9/618–02.4	Date Terminated:	June 10, 1994
Vork Order Number:	940225	Termination Method:	Direct pipette
est Species:	*Dendraster excentricus*	Initial Density:	15400 embryos/L
ook: 5 Page: 39		Aliquot Size (mL):	10
		Test Volume (mL):	1000

Sample ID	Rep/ Conc	pH	D.O. (mg/L)	Temperature (°C)	Salinity (ppt)
AC–HY–8T	A	7.5	7.8	16.0	30
	B	7.6	7.9	16.0	30
	C	7.6	8.0	16.0	30
	D	7.6	8.1	16.0	30
	E	7.5	7.8	16.0	30
	WQ	7.5	7.6	16.0	30
AC–HY–9T	A	7.6	8.0	16.0	29
	B	7.4	7.8	16.0	29
	C	7.3	6.4	16.0	29
	D	7.5	7.6	16.0	29
	E	7.4	7.2	16.0	29
	WQ	7.6	8.0	16.0	29
AC–HY–10T	A	7.5	7.9	16.0	30
	B	7.5	7.9	16.0	30
	C	7.4	7.2	16.0	30
	D	7.5	7.8	16.0	30
	E	7.5	7.9	16.0	30
	WQ	7.5	7.8	16.0	30
AC–HY–11T	A	7.6	8.0	16.0	30
	B	7.4	7.4	16.0	30
	C	7.4	7.6	16.0	30
	D	7.5	7.8	16.0	30
	E	7.4	7.6	16.0	30
	WQ	7.4	8.0	16.0	30
AC–HY–12T	A	7.3	6.4	16.0	30
	B	7.4	7.4	16.0	30
	C	7.3	6.8	16.0	30
	D	7.5	7.7	16.0	30
	E	7.5	7.8	16.0	30
	WQ	7.3	6.4	16.0	30

00672

certified by: Blanke
Jan 6/95

Echinoderm 4/618-02.4
W.O.# 940225

Setup# 1 Day 0

ASL

RESULTS OF ANALYSIS - Water

File No. E1113

		Control Sediment #1 EL 94 06 08	Control Sediment #2 EL 94 06 08	Control Seawater #1 EL 94 06 08	Control Seawater #2 EL 94 06 08
Nutrients					
Ammonia Nitrogen	N	0.12	0.11	0.02	0.03
Inorganic Parameters					
Sulphide	S	<0.02	<0.02	<0.02	<0.02

Remarks regarding the analyses appear at the beginning of this report.
Results are expressed as milligrams per litre.
< = Less than the detection limit indicated.

00681

LC50:STEPHEN IBM/AT VERS 1.0

FILE: 9/618-02.4 940225 NOAA

TEST: Abnormality - EC50 DATE: June 8, 1994
SPECIES: Dendraster excentricus DURATION: 48 hr
CHEMICAL: SDS
CARRIER: Seawater CARRIER CONC: 30 ppt

Conc	Number exposed	Number dead	Percent dead	Binomial prob(percent)
10.00	100	99	98.9	less
5.60	100	88	87.7	less
3.20	100	24	24.1	less
1.80	100	9	9.2	less
1.00	100	0	0.0	less

The binom test shows that 3.200 and 5.600 can be used as statistically sound at 95 conf since the actual conf level associated with these limits is 100.000

An approx LC50 is 3.980 mg/L SDS

------RESULTS USING THE MOVING AVERAGE METHOD----------

span	g	lc50	95% conf limits	
4	0.009802	3.680	3.411	3.981
3	0.014937	3.739	3.444	4.043
2	0.024027	3.842	3.554	4.193
1	0.040055	3.980	3.744	4.209

-------RESULTS USING THE PROBIT METHOD----------

iterations	g	h	p(good. of fit)
10	0.2734	4.347	0.000

a prob of 0 means that is less than 0.001
* probit warning: prob is less than .05 *

slope= 5.316
95 confidence limits= 2.537 and 8.096

lc50= 3.738
95 confidence limits= 2.804 and 4.988

lc1= 1.365
95 confidence limits= 0.428 and 2.038

00668

Certified by:
Blander
Jan. 5/95

1988 Triumph Street, Vancouver, B.C., Canada V5L 1K5

analytical service laboratories ltd.

FAX: (604) 253-6700 TEL: (604) 253-4188

Echinoderm 9/618-02.4
W.O.# 940225

Setup #1 48-h
JUN 27 1994

CHEMICAL ANALYSIS REPORT

Date:	June 20, 1994
ASL File No.	E1143
Report On:	9/618-02.4 Water Analysis
Report To:	**EVS Environment Consultants** 195 Pemberton Avenue North Vancouver, BC V7P 2R4
Attention:	**Mr. Todd Shannon**
Received:	June 13, 1994

ASL ANALYTICAL SERVICE LABORATORIES LTD.
per:

Heather A. Ross, B.Sc.
Project Chemist

Katherine Thomas, B.Sc.
Project Chemist

00683

ECHINODERM LARVAL DEVELOPMENT TOXICITY TEST RAW DATA RECORD

Client:	NOAA	Date Initiated:	June 8, 1994
Project Number:	9/618-02.4	Date Terminated:	June 10, 1994
Work Order Number:	940225	Termination Method:	Direct pipette
Test Species:	*Dendraster excentricus*	Initial Density (embryos/L):	15400
Book: 5 Page: 39		Aliquot Size (mL):	10
		Test Volume (mL):	1000

Sample ID	Rep/ Conc	Normal Larvae	Abnormal Larvae	Total Larvae	% Abnormal Larvae	Mean % Abnormal	Mean Net % Abnormal	% Mortality	Mean % Mortality	% Combined Mortality	Mean % Combined Mortality
Control Sediment 1	A	200	5	205	2.4	4.7	NA	-33.1	-20.0	-29.9	-14.4
	B	166	11	177	6.2			-14.9		-7.8	
	C	181	10	191	5.2			-24.0		-17.5	
	D	156	12	168	7.1			-9.1		-1.3	
	E	178	5	183	2.7			-18.8		-15.6	
Control Seawater 1	A	186	6	192	3.1	2.3	NA	-24.7	-12.2	-20.8	-9.6
	B	152	4	156	2.6			-1.3		1.3	
	C	179	5	184	2.7			-19.5		-16.2	
	D	153	2	155	1.3			-0.6		0.6	
	E	174	3	177	1.7			-14.9		-13.0	
DAC-HY-8T	A	131	12	143	8.4	8.7	NA	7.1	2.5	14.9	11.0
	B	124	7	131	5.3			14.9		19.5	
	C	144	18	162	11.1			-5.2		6.5	
	D	137	10	147	6.8			4.5		11.0	
	E	149	18	167	10.8			-8.4		3.2	
DAC-HY-9T	A	140	39	179	21.8	17.9	NA	-16.2	-12.6	9.1	7.5
	B	151	22	173	12.7			-12.3		1.9	
	C	147	22	169	13.0			-9.7		4.5	
	D	126	46	172	26.7			-11.7		18.2	
	E	148	26	174	14.9			-13.0		3.9	

NA - Not Applicable

09560

9618024\940225ld.wk1

Certified by: [signature] Jan. 4/95.

Echinoderm 4/1618-02.4
W.O.# 940225

Setup # 1 48-h

RESULTS OF ANALYSIS - Water

File No. E1143

		DAC-HY-9T EL	DAC-HY-15T EL	DAC-HY-23T EL	DAC-HY-16T EL	DAC-HY-10T EL
		94 06 10	94 06 10	94 06 10	94 06 10	94 06 10
Nutrients						
Ammonia Nitrogen	N	0.28	0.26	0.37	0.17	0.25
Inorganic Parameters						
Sulphide	S	<0.02	<0.02	<0.02	<0.02	<0.02

Remarks regarding the analyses appear at the beginning of this report.
Results are expressed as milligrams per litre.
< = Less than the detection limit indicated.

00685

Neanthes 9/6018-07.4
W.O.# 940225

Setup #2 Day 20

METHODOLOGY

File No. E1462

Samples were analyzed by methods acceptable to the appropriate regulatory agency. Outlines of the methodologies utilized are as follows:

Conventional Parameters in Water

These analyses are carried out in accordance with procedures described in "Standard Methods for the Examination of Water and Wastewater" 18th Ed. published by the American Public Health Association, 1992. Further details are available on request.

End of Report

00658

Setup # Echinoderm 4/6/18-02.4 Setup 1 48-A
W.O. # 940225

RESULTS OF ANALYSIS - Water

File No. E1143

		DAC-HY-21T EL	DAC-HY-19T EL	DAC-HY-17T EL	DAC-HY-18T EL	DAC-HY-20T EL
		94 06 10	94 06 10	94 06 10	94 06 10	94 06 10
Nutrients						
Ammonia Nitrogen	N	0.32	0.34	0.20	0.38	0.49
Inorganic Parameters						
Sulphide	S	<0.02	<0.02	<0.02	<0.02	<0.02

Remarks regarding the analyses appear at the beginning of this report.
Results are expressed as milligrams per litre.
< = Less than the detection limit indicated.

00687

Neanthes 9/618-02.4
W.O.# 940225

Setup #2 Day 20

RESULTS OF ANALYSIS - Water

File No. E1482

		DAC-HY-6T N	DAC-HY-25T N	DAC-HY-11T N	DAC-HY-8T N	DAC-HY-5T N
		94 06 23	94 06 23	94 06 23	94 06 23	94 06 23
Nutrients						
Ammonia Nitrogen	N	1.33	3.23	2.05	0.152	0.131
Inorganic Parameters						
Sulphide	S	<0.02	<0.02	<0.02	<0.02	<0.02

Remarks regarding the analyses appear at the beginning of this report.
Results are expressed as milligrams per litre.
< = Less than the detection limit indicated.

00656

Echinoderm 9/618-024 Setup #1 48-h
W.O.# 940225

METHODOLOGY File No. E1143

Samples were analyzed by methods acceptable to the appropriate regulatory agency. Outlines of the methodologies utilized are as follows:

Conventional Parameters in Water

These analyses are carried out in accordance with procedures described in "Standard Methods for the Examination of Water and Wastewater" 18th Ed. published by the American Public Health Association, 1992. Further details are available on request.

End of Report

00689

Neanthes 9/018-02.4
W.O. # 940225

Setup #2 Day 10

RESULTS OF ANALYSIS - Water

File No. E1482

		Control Sediment #1 N 94 06 23	Control Sediment #2 N 94 06 23	DAC-HY-9T N 94 06 23	DAC-HY-7T N 94 06 23	DAC-HY-12T N 94 06 23
Nutrients						
Ammonia Nitrogen	N	5.06	7.66	0.189	0.670	0.240
Inorganic Parameters						
Sulphide	S	<0.02	<0.02	<0.02	<0.02	<0.02

Remarks regarding the analyses appear at the beginning of this report.
Results are expressed as milligrams per litre.
< = Less than the detection limit indicated.

00654

ECHINODERM LARVAL DEVELOPMENT TOXICITY TEST RAW DATA RECORD

Client:	NOAA	Date Initiated:	June 9, 1994
Project Number:	9/618-02.4	Date Terminated:	June 11, 1994
Work Order Number:	940225	Termination Method:	Direct pipette
Test Species:	*Dendraster excentricus*	Initial Density (embryos/L):	18500
Book: 5 Page: 45		Aliquot Size (mL):	10
		Test Volume (mL):	1000

Sample ID	Rep/ Conc	Normal Larvae	Abnormal Larvae	Total Larvae	% Abnormal Larvae	Mean % Abnormal	Mean Net % Abnormal	% Mortality	Mean % Mortality	% Combined Mortality	Mean % Combined Mortality
DAC-HY-24T	A	133	7	140	5.0	7.7	NA	24.3	24.6	28.1	30.5
	B	147	11	158	7.0			14.6		20.5	
	C	110	14	124	11.3			33.0		40.5	
	D	132	11	143	7.7			22.7		28.6	
	E	121	11	132	8.3			28.6		34.6	
DAC-HY-26T	A	190	22	212	10.4	10.9	NA	-14.6	-9.2	-2.7	2.7
	B	191	25	216	11.6			-16.8		-3.2	
	C	154	17	171	9.9			7.6		16.8	
	D	179	20	199	10.1			-7.6		3.2	
	E	186	26	212	12.3			-14.6		-0.5	
DAC-CR-2T	A	138	11	149	7.4	9.1	NA	19.5	33.4	25.4	39.5
	B	110	9	119	7.6			35.7		40.5	
	C	98	11	109	10.1			41.1		47.0	
	D	115	10	125	8.0			32.4		37.8	
	E	99	15	114	13.2			38.4		46.5	
DAC-CR-2AT	A	175	13	188	6.9	6.6	NA	-1.6	-1.9	5.4	4.8
	B	197	14	211	6.6			-14.1		-6.5	
	C	168	14	182	7.7			1.6		9.2	
	D	170	14	184	7.6			0.5		8.1	
	E	171	7	178	3.9			3.8		7.6	

00691

NA – Not Applicable

961024\0225ldb.wk1

Certified by: RSander

1988 Triumph Street, Vancouver, B.C., Canada V5L 1K5
analytical service laboratories ltd.
FAX: (604) 253-6700 TEL: (604) 253-4188

Neanthes 9/618-02.4
W.O. # 940225

Setup #2 Day 20

CHEMICAL ANALYSIS REPORT

Date:	July 6, 1994
ASL File No.	E1482
Report On:	9/618-02-4 Water Analysis
Report To:	**EVS Environment Consultants** 195 Pemberton Avenue North Vancouver, BC V7P 2R4
Attention:	**Mr. Todd Shannon**
Received:	June 24, 1994

ASL ANALYTICAL SERVICE LABORATORIES LTD.
per:

Heather A. Ross, B.Sc.
Project Chemist

Katherine Thomas, B.Sc.
Project Chemist

00652

ECHINODERM LARVAL DEVELOPMENT TOXICITY TEST RAW DATA RECORD

Client:	NOAA	Date Initiated:	June 9, 1994
Project Number:	9/618-02.4	Date Terminated:	June 11, 1994
Work Order Number:	940225	Termination Method:	Direct pipette
Test Species:	*Dendraster excentricus*	Initial Density (embryos/L):	18500
Book: 5 Page: 45		Aliquot Size (mL):	10
		Test Volume (mL):	1000

Sample ID	Rep/ Conc	Normal Larvae	Abnormal Larvae	Total Larvae	% Abnormal Larvae	Mean % Abnormal	Mean Net % Abnormal	% Mortality	Mean % Mortality	% Combined Mortality	Mean % Combined Mortality
DAC-HY-4T	A	171	6	177	3.4	4.2	NA	4.3	17.8	7.6	21.3
	B	132	4	136	2.9			26.5		28.6	
	C	128	9	137	6.6			25.9		30.8	
	D	150	7	157	4.5			15.1		18.9	
	E	147	6	153	3.9			17.3		20.5	
DAC-HY-6T	A	179	17	196	8.7	8.8	NA	-5.9	4.9	3.2	13.2
	B	121	11	132	8.3			28.6		34.6	
	C	170	11	181	6.1			2.2		8.1	
	D	167	15	182	8.2			1.6		9.7	
	E	166	23	189	12.2			-2.2		10.3	
DAC-HY-7T	A	141	12	153	7.8	7.4	NA	17.3	6.6	23.8	13.5
	B	168	11	179	6.1			3.2		9.2	
	C	174	14	188	7.4			-1.6		5.9	
	D	148	11	159	6.9			14.1		20.0	
	E	169	16	185	8.6			0.0		8.6	
DAC-HY-14T	A	155	5	160	3.1	4.2	NA	13.5	8.2	16.2	12.1
	B	181	6	187	3.2			-1.1		2.2	
	C	163	10	173	5.8			6.5		11.9	
	D	130	5	135	3.7			27.0		29.7	
	E	184	10	194	5.2			-4.9		0.5	

6900
63

NA – Not Applicable

961\024\02251db.wk1

certified by: Blanden

Neanthes 9/618-02.4
W.O.# 940225

Setup #2 · Day 0

RESULTS OF ANALYSIS - Water

File No. D9893

		DAC-HY-1TN	DAC-CR-2T	DAC-CR-2TN	DAC-CR-2AT	DAC-CR-2ATN
		94 06 02	94 06 02	94 06 02	94 06 02	94 06 02
Nutrients						
Ammonia Nitrogen	N	0.220	0.160	0.420	0.096	0.250
Inorganic Parameters						
Sulphide	S	<0.02	0.03	0.04	0.03	0.03

Results are expressed as milligrams per litre.
< = Less than the detection limit indicated.

00650

ECHINODERM LARVAL DEVELOPMENT TOXICITY TEST RAW DATA RECORD

Client:	NOAA	Date Initiated:	June 9, 1994
Project Number:	9/618–02.4	Date Terminated:	June 11, 1994
Work Order Number:	940225	Termination Method:	Direct pipette
Test Species:	*Dendraster excentricus*	Initial Density (embryos/L):	18500
Book: 5 Page: 45		Aliquot Size (mL):	10
		Test Volume (mL):	1000

Sample ID	Rep/ Conc	Normal Larvae	Abnormal Larvae	Total Larvae	% Abnormal Larvae	Mean % Abnormal	Mean Net % Abnormal	% Mortality	Mean % Mortality	% Combined Mortality	Mean % Combined Mortality
Reference	A 10.0	31	60	91	65.9	61.2	59.3	50.8	45.7	83.2	78.9
Toxicant	B	47	63	110	57.3			40.5		74.6	
(SDS in mg/L)											
	A 5.6	103	18	121	14.9	12.8	8.5	34.6	28.1	44.3	37.3
	B	129	16	145	11.0			21.6		30.3	
	A 3.2	107	27	134	20.1	18.8	14.8	27.6	22.2	42.2	36.8
	B	127	27	154	17.5			16.8		31.4	
	A 1.8	198	8	206	3.9	5.0	0.3	−11.4	−8.6	−7.0	−3.2
	B	184	12	196	6.1			−5.9		0.5	
	A 1.0	214	14	228	6.1	4.1	−0.6	−23.2	−12.7	−15.7	−8.1
	B	186	3	189	1.6			−2.2		−0.5	

00695

9618024\0225ldb.vk1

Certified by: Blander

Neanthes 9/618-02 4
W.O.# 940225

Setup #2 Day 0

RESULTS OF ANALYSIS - Water

File No. D9893

		DAC-HY-28TN	Control 1	Control 1N	Control 2	Control 2N
		94 06 02	94 06 02	94 06 02	94 06 02	94 06 02
Nutrients						
Ammonia Nitrogen	N	0.650	0.260	0.280	0.240	0.230
Inorganic Parameters						
Sulphide	S	<0.02	<0.02	<0.02	<0.02	<0.02

Results are expressed as milligrams per litre.
< = Less than the detection limit indicated.

00648

8-h Embryo-larval toxicity test with *D. excentricus*

QA/QC Summary Sheet

Client : NOAA

Project No. : 9/1018-02.4

Work Order. : 940225

Summary of sediment toxicity test results. Setup #2

Sample I.D.	Mean Value ± ~~S.D.~~ NS % ~~Abn Survival~~ NS	% ~~Mort. Dry Weight~~ NS	% Comb. Mort.
CONTROL S.W. #1	2.7	-10.1	-7.1
CONTROL SED. #1	5.0	-6.5	-1.2
DAC-HY-2T	8.5	-6.3	2.8
DAC-HY-5T	8.8	6.4	14.6
DAC-HY-25T NS	7.7	24.6	30.5
DAC-HY-26T	10.9	-9.2	2.7
DAC-CR-2T	9.1	33.4	39.5
DAC-CR-2AT	6.6	-1.9	4.8

WATER QUALITY PARAMETERS: (0, 24 + 48-h) TEST SOLUTIONS

Dissolved Oxygen : 6.0 - 8.1 mg/L

pH : 7.0 - 7.8

NS ~~Salinity~~ **Conductivity** : 30 - 32 ppt

Temperature : 15.5 - 16.0 °C

LC50 (~~48h~~ 96h) (Cd, Zn) SDS : 9.1 mg/L SDS

95% C.L. = 5.6 and ∞ mg/L SDS

Note this value is out of lab range. Indicates animals were more tolerant.

Cd. Reftox 48h
8.2 mg/L Cd
95% C.L. = 3.2 and 32.0 mg/L Cd
Lab Mean: 11.2 ± 8.0 mg/L Cd.

00697

Lab Mean
~~2.4 ± 1.0 mg/L~~ NS ~~SDS~~
3.2 ± 3.3 mg/L SDS

certified by: R Randall

Neanthes 9/018-02-A
W.O.# 940225

Solvy #2 Day 0

RESULTS OF ANALYSIS - Water

File No. D9893

		DAC-HY-11TN	DAC-HY-12T	DAC-HY-12TN	DAC-HY-25T	DAC-HY-25TN
		94 06 02	94 06 02	94 06 02	94 06 02	94 06 02
Nutrients						
Ammonia Nitrogen	N	0.640	0.380	0.480	0.260	1.00
Inorganic Parameters						
Sulphide	S	<0.02	<0.02	<0.02	<0.02	<0.02

Results are expressed as milligrams per litre.
< = Less than the detection limit indicated.

00646

ECHINODERM LARVAL DEVELOPMENT TOXICITY TEST – 0 h

Client:	NOAA	Date Initiated:	June 9, 1994
Project Number:	0618–02.4	Date Terminated:	June 11, 1994
Work Order Number:	940225	Termination Method:	Direct pipette
Test Species:	*Dendraster excentricus*	Initial Density:	18500 embryos/L
Book: 5 Page: 45		Aliquot Size (mL):	10
		Test Volume (mL):	1000

Sample ID	Rep/ Conc	pH	D.O. (mg/L)	Temperature (°C)	Salinity (ppt)
DAC–HY–1T	WQ	7.7	6.6	15.5	31
DAC–HY–2T	WQ	7.6	7.0	15.5	31
DAC–HY–3T	WQ	7.7	5.7	15.5	31
DAC–HY–4T	WQ	7.7	6.0	15.5	31
DAC–HY–5T	WQ	7.6	6.2	15.5	31
DAC–HY–6T	WQ	7.7	5.9	15.5	31
DAC–HY–7T	WQ	7.6	6.1	15.5	32
DAC–HY–14T	WQ	7.6	6.1	15.5	31
DAC–HY–24T	WQ	7.6	5.0	15.5	31
DAC–HY–25T	WQ	7.6	5.0	15.5	32
DAC–HY–26T	WQ	7.5	5.1	15.5	31
DAC–HY–27T	WQ	7.5	5.2	15.5	31
DAC–HY–28T	WQ	7.5	5.0	15.5	32
DAC–CR–2T	WQ	7.6	6.8	15.5	32
DAC–CR–2AT	WQ	7.6	6.8	15.5	32
Control Sediment 1	WQ	7.6	7.4	15.5	31
Control Sediment 2	WQ	7.7	7.4	15.5	31
Control Seawater 1	WQ	7.6	7.7	15.5	31
Control Seawater 2	WQ	7.7	7.8	15.5	31
Reference Toxicant (SDS in mg/L)	WQ 10.0	7.6	8.0	16.0	31
	WQ 5.6	7.6	7.8	16.0	30
	WQ 3.2	7.6	7.8	16.0	30
	WQ 1.8	7.6	7.8	16.0	31
	WQ 1.0	7.6	7.9	16.0	30

00699

certified by: Blanda / Jan. 6 '95

Neanthes 9/618-02-4
W.O.# 940225

Setup #2 Day 0

RESULTS OF ANALYSIS - Water **File No. D9893**

		DAC-HY-6TN	DAC-HY-7T	DAC-HY-7TN	DAC-HY-8T	DAC-HY-8TN
		94 06 02	94 06 02	94 06 02	94 06 02	94 06 02
Nutrients						
Ammonia Nitrogen	N	0.570	0.560	0.670	0.670	0.680
Inorganic Parameters						
Sulphide	S	<0.02	<0.02	<0.02	<0.02	<0.02

Results are expressed as milligrams per litre.
< = Less than the detection limit indicated.

00644

ECHINODERM LARVAL DEVELOPMENT TOXICITY TEST – 48 h

Client:	NOAA	Date Initiated:	June 9, 1994
Project Number:	9/618-02.4	Date Terminated:	June 11, 1994
Work Order Number:	940225	Termination Method:	Direct pipette
Test Species:	*Dendraster excentricus*	Initial Density:	18500 embryos/L
Book: 5 Page: 45		Aliquot Size (mL):	10
		Test Volume (mL):	1000

Sample ID	Rep/ Conc	pH	D.O. (mg/L)	Temperature (°C)	Salinity (ppt)
DAC-HY-1T	A	7.6	7.6	16.0	30
	B	7.6	7.6	16.0	30
	C	7.6	7.6	16.0	30
	D	7.4	6.4	16.0	30
	E	7.7	7.4	16.0	30
	WQ	7.7	7.8	16.0	30
DAC-HY-2T	A	7.6	7.6	16.0	31
	B	7.5	7.6	16.0	31
	C	7.7	7.6	16.0	30
	D	7.7	7.6	16.0	31
	E	7.7	7.7	16.0	31
	WQ	7.4	7.6	16.0	31
DAC-HY-3T	A	7.7	7.6	16.0	31
	B	7.6	7.5	16.0	31
	C	7.7	7.6	16.0	31
	D	7.7	7.5	16.0	31
	E	7.7	7.6	16.0	31
	WQ	7.7	7.7	16.0	31
DAC-HY-4T	A	7.5	7.4	16.0	31
	B	7.6	7.4	16.0	31
	C	7.6	7.4	16.0	31
	D	7.7	7.4	16.0	31
	E	7.8	7.6	16.0	31
	WQ	7.4	6.8	16.0	31
DAC-HY-5T	A	7.6	7.7	16.0	30
	B	7.4	6.2	16.0	30
	C	7.5	7.2	16.0	31
	D	7.7	7.5	16.0	30
	E	7.6	7.6	16.0	30
	WQ	7.6	7.7	16.0	31

00701

Certified by: Blander
Jan. 6/95

B:\9618024\223bWQ48.WK1

1988 Triumph Street, Vancouver, B.C., Canada V5L 1K5

analytical
service
laboratories
ltd.

FAX: (604) 253-6700 TEL: (604) 253-4188

Neanthes 9/618-02.4
W.O. # 940225

Setup # 2, Day 0

CHEMICAL ANALYSIS REPORT

Date: June 13, 1994

ASL File No. D9893

Report On: 9/618-02.4 Water Analysis

Report To: **EVS Environment Consultants**
195 Pemberton Avenue
North Vancouver, BC
V7P 2R4

Received: June 6, 1994

ASL ANALYTICAL SERVICE LABORATORIES LTD.
per:

Heather A. Ross, B.Sc.
Project Chemist

Katherine Thomas, B.Sc.
Project Chemist

00642

ECHINODERM LARVAL DEVELOPMENT TOXICITY TEST – 48 h

Client:	NOAA	Date Initiated:	June 9, 1994
Project Number:	9/618–02.4	Date Terminated:	June 11, 1994
Work Order Number:	940225	Termination Method:	Direct pipette
Test Species:	*Dendraster excentricus*	Initial Density:	18500 embryos/L
Book: 5 Page: 45		Aliquot Size (mL):	10
		Test Volume (mL):	1000

Sample ID	Rep/ Conc	pH	D.O. (mg/L)	Temperature (°C)	Salinity (ppt)
DAC–HY–26T	A	7.5	7.4	16.0	31
	B	7.4	7.4	16.0	30
	C	7.5	7.4	16.0	30
	D	7.5	7.4	16.0	30
	E	7.4	6.5	16.0	30
	WQ	7.4	7.4	16.0	30
DAC–HY–27T	A	7.5	7.5	16.0	31
	B	7.0	5.8	16.0	31
	C	7.4	7.2	16.0	31
	D	7.4	7.4	16.0	31
	E	7.5	7.4	16.0	31
	WQ	7.4	7.5	16.0	31
DAC–HY–28T	A	7.6	7.2	16.0	31
	B	7.7	7.5	16.0	31
	C	7.2	5.7	16.0	30
	D	7.5	7.0	16.0	31
	E	7.5	7.4	16.0	30
	WQ	7.4	7.2	16.0	31
DAC–CR–2T	A	7.5	7.6	16.0	30
	B	7.5	7.8	16.0	31
	C	7.6	7.6	16.0	30
	D	7.5	7.6	16.0	31
	E	7.5	7.4	16.0	31
	WQ	7.5	7.8	16.0	30
DAC–CR–2AT	A	7.6	7.4	16.0	30
	B	7.6	7.6	16.0	31
	C	7.6	7.6	16.0	31
	D	7.6	7.8	16.0	31
	E	7.6	7.7	16.0	31
	WQ	7.6	7.8	16.0	31

00703

certified by: B Lander Jan. 6/95

SAMPLE I.D. NOAA

DATE COLLECTED Received May 27/94

TEST DATE/TIME June 3 194 1900h

NO. ORGANISMS/VOLUME 5/Test Cntain & 10/ Reflect Cultures 10/L

Subsp #2.

EVS CONSULTANTS
ACUTE TOXICITY TEST DATA

Page No. 1/1

PROJECT NAME NOAA

EVS PROJECT NO. 9/618-02-L

WORK ORDER NO. 9[illegible]4022-5

TEST SPECIES Mysidopsis

SOURCE & BATCH Don Reich May 26/94.

CONCN ng/L Cd	PERCENT SURVIVAL (1 to 96 hours)							DISSOLVED OXYGEN (mg/L)					TEMPERATURE (°C)					pH					SALINITY (ppt)	
	1	2	4	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	96
Cd(NO3)2 95. 32.0				0	—	—	—	7.3	7.3	—	—	—	21	21		—	—	7.9	8.0		—	—	29	—
18.0				0	—	—	—	7.3	7.3	—	—	—	21	21		—	—	8.0	8.0		—	—	29	—
10.0				100	0	—	—	7.3	7.2	7.3	—		21	21	20.5	20.5	21	8.0	8.0	7.9	—	—	29	—
5.6				100	100	100	80	7.3	7.2	7.3	7.7	7.4 7.6	21.5	20.5	20.5	20.5	21	8.0	8.0	7.9	7.8	7.9	29	28 28
3.2				100	100	100	100	7.4	7.2	7.4	7.5	7.4 7.6	21.5	21	20.5	20.5	21	8.0	8.0	7.9	7.9	7.9	29	27
1.8				100	100	100	100	7.4	7.0	7.3	7.7	7.4 7.6	21.5	20.5	20.5	20.5	21	7.9	7.9	7.9	7.8	7.9	29	28
Control				100	90	100	100	7.3	7.1	7.3	7.8	7.3 7.8	21	21	20.5	20.5	21	7.9	7.9	7.9	7.8	7.8	29	27
Technician																								

SAMPLE DESCRIPTION

COMMENTS

TEST SET UP BY: Mel. DATA VERIFIED BY: Judith Crane DATE VERIFIED: Aug 11, 1994

EVS ENVIRONMENT CONSULTANTS

03900

ECHINODERM LARVAL DEVELOPMENT TOXICITY TEST – 48 h

Client:	NOAA	Date Initiated:	June 9, 1994
Project Number:	9/618–02.4	Date Terminated:	June 11, 1994
Work Order Number:	940225	Termination Method:	Direct pipette
Test Species:	*Dendraster excentricus*	Initial Density:	18500 embryos/L
Book: 5 Page: 45		Aliquot Size (mL):	10
		Test Volume (mL):	1000

Sample ID	Rep/ Conc	pH	D.O. (mg/L)	Temperature (°C)	Salinity (ppt)
Reference Toxicant (SDS in mg/L)	A 10.0	7.4	7.4	17.0	31
	B	7.0	5.0	17.0	31
	WQ	7.4	7.1	17.0	30
	A 5.6	7.3	7.1	17.0	30
	B	7.4	7.3	17.0	30
	WQ	7.5	7.1	17.0	30
	A 3.2	7.4	7.3	17.0	30
	B	7.4	7.4	17.0	30
	WQ	7.4	7.4	17.0	31
	A 1.8	7.1	7.1	17.0	30
	B	7.4	7.4	17.0	30
	WQ	7.2	6.8	17.0	30
	A 1.0	7.4	7.5	17.0	30
	B	7.3	7.5	17.0	30
	WQ	7.3	7.6	17.0	30

00705

B:\961802\225bWQ48.wk1

certified by: Blander
Jan 6/95

AMPHIPODS - *Ampelisca* 20-d SEDIMENT TOXICITY TEST

DAILY WATER QUALITY MONITORING

Water Quality Instruments Used

D.O. Meter II-4-3

pH Meter II-A-16 #9

Salinity II-C-12 (refr)

Temperature Thermometer

Client: NOAA

EVS Project No.: 9/618-02-4

EVS W.O. No.: 940925

Day 0: May 31/94 & June 3/94 (Set #2)

Day 20: June 20/94 & June 23/94

Test Species: A. millsi

Source/Collection Date: Don Ficke / May 26/94

Set up #2

SAMPLE I.D.	TEMPERATURE (°C)																					SALINITY (ppt)								DISSOLVED OXYGEN (mg/L)								pH							
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	0	3	6	9	12	15	18	20	0	3	6	9	12	15	18	20	0	3	6	9	12	15	18	20
DAC-CR-2AT A	20.5	20.5	20.5	20.5	21	21	20.5	20.5	20	20	20	20	20	20	20°	20	20	20	20	20	20	30	27	29	28	30	29	29	30	7.4	7.2	6.7	6.7	6.7	7.1	6.5	7.4	7.9	8.0	7.8	7.8	7.9	7.3	7.8	8.0
B	20.5	20.5	20.5	20.5	21	21	20.5	20.5	20	20	20	20	20	20	20°	20	20	20	20	20	20	30	26	30	27	30	28	29	30	7.4	6.8	6.6	6.4	6.4	5.8	6.7	7.4	7.9	7.9	7.8	7.8	7.9	7.9	7.8	8.0
DAC-CR-2T C	20.5	21	20.5	20.5	21	21	20.5	20.5	20	20	20	20	20	20	20°	20	20	20	20	20	20	29	27	29	29	30	29	30	30	7.2	7.0	6.8	6.8	7.0	6.5	6.8	7.2	7.9	7.9	7.8	8.1	8.0	7.9	8.2	8.0
B	20.5	21	20.5	20.5	21	21	20.5	20.5	20	20	20	20	20	20	20°	20	20	20	20	20	20	29	27	29	28	30	29	29	29	7.2	7.2	6.4	6.8	7.0	6.4	2.0	7.1	7.9	8.1	7.8	8.1	8.0	7.5	8.2	
DAC-Hy-1T C	20.5	21	20.5	20.5	21	21	20.5	20.5	20	20	20	20	20	20	20°	20	20	21	20	20	20	29	27	29	29	29	29	29	30	7.3	7.3	6.6	6.6	6.9	6.6	6.8	7.2	7.9	8.0	7.8	7.8	7.9	7.8	7.9	8.0
D	20.5	21	20.5	20.5	21	21	20.5	20.5	20	20	20	20	20	20	20°	20	20	20	20	20	20	29	27	29	29	29	29	30	31	7.3	7.4	6.7	6.7	6.7	6.5	7.0	7.4	7.9	8.0	7.7	7.9	7.9	7.9	7.9	8.1
DAC-Hy-2T D	20.5	21	20.5	20.5	21	21	20.5	20.5	20	20	20	20	20	20	20°	20	20	21	20	20	20	29	27	29	29	30	30	31	31	7.2	7.4	6.7	6.8	7.0	6.7	7.1	7.3	7.9	8.0	7.9	8.0	8.0	8.0	8.1	8.2
E	20.5	21	20.5	20.5	21	21	20.5	20.5	20	20	20	20	20	20	20°	20	20	20	20	20	20	29	27	28	28	31	31	32	31	7.2	7.4	6.5	6.8	7.0	6.7	6.8	7.2	7.9	8.0	7.9	8.0	8.0	8.1	8.3	8.3
DAC-Hy-3T A	20.5	21	20.5	20.5	21	21	20.5	20.5	20	20	20	20	20	20	20°	20	20	20	20	20	20	29	28	29	29	28	28	30	30	7.0	7.0	6.8	6.0	6.3	6.5	6.5	5.4	7.8	7.9	7.9	7.9	7.9	8.0	7.8	8.3
C	20.5	21	20.5	20.5	21	21	20.5	20.5	20	20	20	20	20	20	20°	20	20	20	20	20	20	29	27	28	28	30	29	30	30	7.0	7.2	5.8	6.5	6.5	6.5	6.6	7.0	7.9	8.0	8.0	8.1	8.1	8.1	8.1	8.3
Technician's Initials																																													

Comments/Adjustments Made: Day 0: DAC-CR-2T Rep A: Counted 10 animals rec'd (1) Aeration off. Adjusted pH (2) adjusted (increased) aeration rate

DAC-CR-2T C - 0 & 20 animals rec'd - Adjusted aeration - Do blown from 5/94 (3) Aeration off. Adjusted pH

Use only black, ball-point pen. Cross out errors with a single line; initial and date corrections. Do not use "White-Out", correcting tape or eraser to make changes.

certified Aug 11, 1994

Dendraster spp. 9/618-02.4 Setup #2 Day 0
W.O.# 940225

REMARKS

File No. E1112

As indicated on the chain of custody, these samples are identified as "Day 0, Set up #2 (June 9, 1994) Echinoderm Larval".

00707

Water Quality Instrumens Used

D.O. Meter IE-A-3
pH Meter IE-A-16 #9
Salinity IE-C-12 (STD)
Temperature Thermometer

DAILY WATER QUALITY MONITORING

Page No. 2/4

Client: NOAA
EVS Project No.: 9/618-02-4
EVS W.O. No.: 940225
Day 0: ~~May 31/94~~ 5 June 3/94
Day 20: ~~June 20/94~~ 3 June 23/94
Test Species: M. bahia
Source/Collection Date: Don Kiker May 27/94

2.8 ppt

SAMPLE I.D.	TEMPERATURE (°C)																					SALINITY (ppt)								DISSOLVED OXYGEN (mg/L)								pH							
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	0	3	6	9	12	15	18	20	0	3	6	9	12	15	18	20	0	3	6	9	12	15	18	20
DAC-Hy-26TC	20.5	20.5	20.5	20.5	21	21	20.5	20.5	20	20	20	20	20	20	19.9	20	20	20	19.9	20	20	29	29	30	29	29	30	31	30	7.2	7.4	5.9	6.4	6.9	6.7	6.9	6.2	7.8	7.9	8.2	8.1	8.0	8.0	7.9	7.9
D	20.5	20.5	20.5	20.5	21	21	20.5	20.5	20	20	20	20	20	20	19.9	20	20	20	20	20	20	29	29	30	32	32	32	33	32	7.3	7.6	6.7	6.4	6.7	6.6	7.0	6.2	7.9	8.0	8.2	8.1	8.1	8.1	8.0	7.9
DAC-Hy-4TA	20.5	20.5	20.5	20.5	21	21	20.5	20.5	20	20	20	20	20	20	19.9	20	20	20	20	20	20	29	28	30	30	30	31	32	32	7.2	7.4	6.7	6.6	7.0	6.6	6.9	5.4	7.7	8.0	8.2	8.1	8.1	8.0	8.0	7.9
B	20.5	20.5	20.5	20.5	21	21	20.5	20.5	20	20	20	20	20	19.9	19.9	20	20	20	20	20	20	29	27	29	30	30	30	31	31	7.2	7.4	6.8	6.8	6.8	6.6	6.9	6.2	7.9	8.0	8.1	8.2	8.0	8.1	8.0	7.9
DAC-Hy-10TC	20.5	20.5	20.5	20.5	21	21	20.5	20.5	20	20	20	20	20	20	19.9	20	20	20	20	20	20	30	29	30	31	30	31	32	31	7.8	7.4	6.8	6.7	6.7	6.2	7.1	6.2	8.0	8.1	8.3	8.4	8.3	8.3	8.3	8.2
E	20.5	20.5	20.5	20.5	21	21	20.5	20.5	20	20	20	20	20	20	19.9	20	20	20	20	20	20	30	29	30	32	32	33	32	32	7.3	7.4	6.9	6.8	7.0	6.8	7.1	6.7	8.0	8.2	8.3	8.4	8.3	8.4	8.3	8.3
DAC-Hy-28TB	20.5	20.5	20.5	20.5	21	21	20.5	20.5	20	20	20	20	20	19.9	19.9	20	20	21	20	20	20	29	27	29	29	30	31	31	30	7.2	7.3	6.7	6.4	6.2	5.7	5.8	6.1	7.9	8.0	8.1	7.7	8.0	7.5	7.6	7.8
C	20.5	20.5	20.5	20.5	21	21	20.5	20.5	20	20	20	20	20	19.9	19.9	20	20	21	20	20	20	29	27	29	29	30	32	30	29	7.2	7.3	6.7	6.8	6.4	5.0	6.4	6.4	7.7	8.1	8.2	7.7	7.3	7.3	8.0	7.5
DAC-Hy-27TD	20.5	20.5	20.5	20.5	21	21	20.5	20.5	20	20	20	20	20	19.9	19.9	20	20	21	20	20	20	29	27	29	29	30	32	31	29	7.2	5.2	6.7	6.2	6.7	6.4	6.5	5.8	7.8	7.4	8.0	8.0	8.1	8.0	7.9	7.7
Technician's Initials																																													

Comments/Adjustments Made: ② Aeration off. Adjusted. ③ Aeration off; adjusted ④ increased aeration ⑤ measured aeration ⑥
DAC-Hy-26T ... 1.3 - 2.8 ppt Acrylic. Aimed - water to 6.7 DAC-Hy-28T pipe tubing 0.8 Aimed Aeration ... to 6.4

Use only black, ball-point pen. Cross out errors with a single line; initial and date corrections. Do not use "White-Out", correcting tape or eraser to make changes.

Certified QC
Aug 11, 1994

0900

Dendraster Spp. 91618-02.4
W.O.# 940225

Setup # 2 Day 0

RESULTS OF ANALYSIS - Water

File No. E1112

		DAC-HY-6T EL	DAC-HY-28T EL	DAC-HY-3T EL	DAC-HY-7T EL	DAC-HY-4T EL
		94 06 09	94 06 09	94 06 09	94 06 09	94 06 09
Nutrients						
Ammonia Nitrogen	N	0.19	0.20	0.17	0.14	0.19
Inorganic Parameters						
Sulphide	S	0.03	0.04	0.05	0.10	0.04

Remarks regarding the analyses appear at the beginning of this report.
Results are expressed as milligrams per litre.
< = Less than the detection limit indicated.

00709

00634

8/8

EVS CONSULTANTS

SEDIMENT TOXICITY TESTS - SURVIVAL AND FINAL WATER QUALITY DATA

Client NOAA
EVS Project Number 9/618-02-4
EVS W.O. No. 940225

Start Date (Day 0) June 3 = Day "0"
End Date June 23 = 20 days
Test Type/Species Ampelisca abdita

setup #2

Sample I.D.	Rep.	Pan No.	No. Alive	No. Dead	Total Recovered	No. Missing	Tech. Init.		pH	Dissolved Oxygen (mg/L)	Temp. (°C)	Cond. (µmhos/cm) ☐ Salinity (ppt) ☑
DAE-Hy-2T	A	175	5	0	5	0			8.2	6.4	20	31
	B	176	4	0	4	1			8.2	6.3	20	30
	C	177	5	0	5	0			8.2	7.2	20	31
	D	178	5	0	5	0			8.2	7.3	20	31
	E	179	5	0	5	0			8.3	7.2	20	31
DAE-Hy-3T	A	180	5	0	5	0			7.9	5.4	20	30
	B	181	5	0	5	0			8.0	5.5	20	30
	C	182	5	0	5	0			8.3	7.0	20	30
	D	183	5	0	5	0			8.2	7.2	20	31
	E	184	5	0	5	0			8.2	6.0	20	32
							Technician's Initials		EJT MJ	EJT MJ	EJT MJ	EJT MJ

Water Quality Instruments: pH II-A-16 #9 D.O. II-A-3 Cond/Salinity II-C-12

Dendraster spp. 9/618-02.4 Setup # 2 Day 0
W.O.# 940225

RESULTS OF ANALYSIS - Water

File No. E1112

		Control Sediment #2 EL 94 06 09	Control Seawater #1 EL 94 06 09	Control Seawater #2 EL 94 06 09	DAC-HY-14T EL 94 06 09
Nutrients					
Ammonia Nitrogen	N	0.05	0.02	0.03	0.12
Inorganic Parameters					
Sulphide	S	<0.02	<0.02	<0.02	0.05

Remarks regarding the analyses appear at the beginning of this report.
Results are expressed as milligrams per litre.
< = Less than the detection limit indicated.

00711

00632 b/8

EVS CONSULTANTS
SEDIMENT TOXICITY TESTS - SURVIVAL AND FINAL WATER QUALITY DATA

Client NOAA
EVS Project Number 9/618-02-4
EVS W.O. No. 940225

Start Date (Day 0) June 3 = Day "0"
End Date June 23 = 20 days
Test Type/Species Leandbius arenaeodentata

Sediment

Sample I.D.	Rep.	Pan No.	No. Alive	No. Dead	Total Recovered	No. Missing	Tech. Init.	pH	Dissolved Oxygen (mg/L)	Temp. (°C)	Cond. (µmhos/cm) ☐ Salinity (ppt) ☐
~~DAC-Hg-11T~~	A	145	5	0	5	0	JJ	7.8	5.0	20	29
	B	146	5	0	5	0	JJ	8.0	5.8	20	30
	C	147	5	0	5	0	JJ	8.0	6.0	20	30
	D	148	5	0	5	0	JJ	8.1	6.2	20	31
	E	149	5	0	5	0	JJ	8.0	5.5	20	31
DAC-Hg-8T	A	150	5	0	5①	0	JJ	8.1	5.9	20	29
	B	151	5	0	5	0	JJ	8.3	6.0	20	30
	C	152	5	0	5	0	JJ	8.3	6.0	20	30
	D	153	4	0	4	1	JJ	8.3	6.2	20	30
	E	154	5	0	5	0	JJ	8.2	6.2	20	31
DAC-Hg-5T	A	155	5	0	5	0	JJ	8.1	6.2	20	31
	B	156	5	0	5	0	JJ	8.1	6.4	20	31
	C	157	5	0	5	0	JJ	8.0	6.3	20	31
	D	158	4	0	4	1	JJ	8.1	6.2	20	31
	E	159	4	0	4	1	JJ	8.1	6.1	20	31
							Technician's Initials				

Water Quality Instruments: pH II-A-16 #9 D.O. II-A-3 Cond./Salinity II-C-12

1988 Triumph Street, Vancouver, B.C., Canada V5L 1K5
analytical service laboratories ltd.
FAX: (604) 253-6700 TEL: (604) 253-4188

Dendrastek 580- 9/618-02.4
W.O.# 940225

Setup # 2 48-h.

JUN 27 1994

CHEMICAL ANALYSIS REPORT

Date:	June 20, 1994
ASL File No.	E1141
Report On:	9/618-02.4 Water Analysis
Report To:	**EVS Environment Consultants** 195 Pemberton Avenue North Vancouver, BC V7P 2R4
Attention:	**Mr. Todd Shannon**
Received:	June 13, 1994

ASL ANALYTICAL SERVICE LABORATORIES LTD.
per:

Heather A. Ross, B.Sc.
Project Chemist

Katherine Thomas, B.Sc.
Project Chemist

00713

00630 4/8

EVS CONSULTANTS
SEDIMENT TOXICITY TESTS - SURVIVAL AND FINAL WATER QUALITY DATA

Client NOAA
EVS Project Number 91618-02-4
EVS W.O. No. 940225

Start Date (Day 0) June 3 = Day "0"
End Date June 23 = 20 days
Test Type/Species Neanthes arenaceodentata

Set up #2

Sample I.D.	Rep.	Pan No.	No. Alive	No. Dead	Total Recovered	No. Missing	Tech. Init.	pH	Dissolved Oxygen (mg/L)	Temp. (°C)	Cond. (µmhos/cm) ☐ Salinity (ppt) ☑
DAC-Hg-27T	A	125	5	0	5	0	PH	8.0	6.0	20	30
	B	126	PH ~~5~~ 10	0	PH ~~5~~ 10	0	PH	7.2	③ 2.2	20	29
	C	127	PH ~~5~~ 0	0	PH ~~5~~ 0	PH ~~0~~ 5	PH	7.9	5.8	20	31
	D	128	5	0	5	0	PH	7.7	6.0	20	29
	E	129	5	0	5	0	PH	7.9	6.0	20	31
DAC-Hg-6T	A	130	5	0	5	0	Z	8.2	5.9	20	29
	B	131	5	0	5	0	Z	7.5	③ 2.1	20	29
	C	132	5	0	5	0	Z	7.9	4.9	20	29
	D	133	5	0	5	0	Z	7.9	5.4	20	29
	E	134	5	0	5	0	Z	8.2	6.3	20	29
DAC-Hg 25T	A	135	5	0	5 ①	0	PH	7.8	5.7	20	29
	B	136	5	0	5	0	PH	7.2	③ 2.6	20	29
	C	137	5	0	5 ②	0	PH	7.9	5.8	20	29
	D	138	5	0	5	0	PH	7.2	③ 2.5	20	30
	E	139	4	0	4	1	PH	7.9	5.5	20	30
							Technician's Initials	PH/ZJT	PH/ZJT	PH/ZJT	PH/ZJT

DAC-Hg-27T - B&C - 10 in B None in C. Z

③ Aerated stopped pts

Water Quality Instruments: pH II-A-16 #9 D.O. II-A-3 Cond./Salinity II-C-12

① [illegible] 135 - Calorimeter Z

Denaraster [illegible]
W.O. # 940225

Setup" 2 70-12

RESULTS OF ANALYSIS - Water

File No. E1141

		DAC-HY-25T EL	DAC-HY-24T EL	DAC-CR-2T EL	DAC-CR-2AT EL	DAC-HY-27T EL
		94 06 11	94 06 11	94 06 11	94 06 11	94 06 11
Nutrients						
Ammonia Nitrogen	N	0.15	0.10	0.19	0.14	0.22
Inorganic Parameters						
Sulphide	S	<0.02	<0.02	<0.02	<0.02	<0.02

Remarks regarding the analyses appear at the beginning of this report.
Results are expressed as milligrams per litre.
< = Less than the detection limit indicated.

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EVS CONSULTANTS
SEDIMENT TOXICITY TESTS - SURVIVAL AND FINAL WATER QUALITY DATA

Client NOAA
EVS Project Number 9/618-02-4
EVS W.O. No. 940225

Start Date (Day 0) June 3 = Day "0"
End Date June 23 = 20 days
Test Type/Species Neanthes arenaceodentata

Subsp #2

Sample I.D.	Rep.	Pan No.	No. Alive	No. Dead	Total Recovered	No. Missing	Tech. Init.	pH	Dissolved Oxygen (mg/L)	Temp. (°C)	Cond. (µmhos/cm) ☐ Salinity (ppt) ☑
DAC-Hg-4T	A	95	5	0	5	0		7.9	5.9	20	32
	B	96	5	0	5	0		7.9	6.2	20	31
	C	97	5	0	5	0		8.1	6.4	20	32
	D	98	5	0	5	0		7.7	6.4	20	31
	E	99	5	0	5	0		8.0	5.9	20	31
DAC-Hg-10T	A	100	5	0	5	0		8.2	6.2	20	31
	B	101	4	0	4	1		8.2	6.2	20	31
	C	102	5	0	5	0		8.2	6.2	20	31
	D	103	5	0	5	0		8.2	6.5	20	31
	E	104	5	0	5	0		8.3	6.7	20	32
DAC-Hg-28T	A	105	5	0	5	0	BH	8.0	6.0	20	29
	B	106	5	0	5	0	BH	8.0	6.1	20	30
	C	107	5	0	5	0	BH	7.5	6.1	20	29
	D	108	5	0	5 ①	0	BH	7.6	5.2	20	29
	E	109	5	0	5	0	BH	8.2	5.7	20	30
							Technician's Initials	PLS EJA	PLS EJA	PLS BH	PLS EJA

Water Quality Instruments: pH II-A-16 #9 D.O. II-A-3 Cond./Salinity II-C-12

Verified

Dendraster spp. 4/618-02 4
W.O. # 940225

Setup "L 48-h

ASL

RESULTS OF ANALYSIS - water

File No. E1141

		DAC-HY-1T EL 94 06 11	DAC-HY-2T EL 94 06 11	DAC-HY-26T EL 94 06 11	DAC-HY-5T EL 94 06 11	Control Sediment #1 EL 94 06 11
Nutrients						
Ammonia Nitrogen	N	0.12	0.06	0.17	0.36	0.06
Inorganic Parameters						
Sulphide	S	<0.02	<0.02	<0.02	<0.02	<0.02

Remarks regarding the analyses appear at the beginning of this report.
Results are expressed as milligrams per litre.
< = Less than the detection limit indicated.

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EVS CONSULTANTS

Dry Weight Data

Client:	NOAA – Setup #2	Test Species:	*Neanthes arenaceodentata*
Project #:	9618–02.4	Date Initiated:	June 3, 1994
Work Order:	94UZZ5	Date Terminated:	June 23, 1994
Test Type:	20–d sediment toxicity test		
		Number of Animals/rep:	5

Sample ID	Rep	Survivors	# of Animals Weighed	Pan Weight (g)	Final Weight (pan + biomass) (g)	Total Biomass (mg)	Individual Biomass (mg)	Mean Survival (%)	Mean Individual Biomass (mg)
DAC–CR–2AT	A	5	5	1.0037	1.0562	52.50	10.50	92.00	9.01
	B	5	5	1.0027	1.0470	44.50	8.86		
	C	5	5	0.9999	1.0409	41.00	8.20		
	D	4	4	0.9985	1.0393	40.80	10.20		
	E	4	4	1.0004	1.0296	29.20	7.30		
DAC–CR–2T	A	5	5	1.0060	1.0495	43.50	8.70	92.00	9.93
	B	4	4	1.0051	1.0492	44.10	11.02		
	C	4	4	1.0079	1.0417	33.80	8.45		
	D	5	5	1.0095	1.0690	59.50	11.90		
	E	5	5	1.0059	1.0538	47.90	9.58		
R & D Control	A	4	4	0.9936	1.0279	34.30	8.58	96.00	9.47
	B	5	5	1.0014	1.0533	51.90	10.38		
	C	5	5	1.0046	1.0448	40.20	8.04		
	D	5	5	0.9990	1.0428	43.80	8.76		
	E	5	5	1.0038	1.0617	57.90	11.58		

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certified for data entry only
ALL Aug. 17, 1994

Denaraster spk 7/10-02 .T
W.O. # 940225

Setup # 2 48-h

METHODOLOGY

File No. E1141

Samples were analyzed by methods acceptable to the appropriate regulatory agency. Outlines of the methodologies utilized are as follows:

Conventional Parameters in Water

These analyses are carried out in accordance with procedures described in "Standard Methods for the Examination of Water and Wastewater" 18th Ed. published by the American Public Health Association, 1992. Further details are available on request.

End of Report

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