TOPSMELT (*A. affinis*)

SAMPLE ID	CONC (%)	REP	SURVIVAL (#)	SURVIVAL (%)	MEAN SURVIVAL (%)	STD DEV	% of CONTROL[1,3]	P-VALUE[b]	SIG DIFF FROM CONTROL?
NAV-OF9-SDB2-COMP	10	a	4	80.0	90.0	11.5	90.0	0.091	No
		b	5	100.0					
		c	4	80.0					
		d	5	100.0					
	50	a	5	100.0	95.0	10.0	95.0	0.196	No
		b	5	100.0					
		c	4	80.0					
		d	5	100.0					
	100	a	3	60.0	90.0	20.0	90.0	0.196	No
		b	5	100.0					
		c	5	100.0					
		d	5	100.0					
NAV-OF11-SDB2-FF	10	a	5	100.0	90.0	11.5	94.7	0.269	No
		b	4	80.0					
		c	5	100.0					
		d	4	80.0					
	50	a	1	20.0	55.0	25.2	57.9	0.021	Yes
		b	3	60.0					
		c	4	80.0					
		d	3	60.0					
	100	a	0	0.0	0.0	0.0	0.0	0.000	Yes
		b	0	0.0					
		c	0	0.0					
		d	0	0.0					
NAV-OF11-SDB2-COMP	10	a	5	100.0	100.0	0.0	105.3	0.196	No
		b	5	100.0					
		c	5	100.0					
		d	5	100.0					
	50	a	5	100.0	100.0	0.0	105.3	0.196	No
		b	5	100.0					
		c	5	100.0					
		d	5	100.0					
	100	a	5	100.0	100.0	0.0	105.3	0.196	No
		b	5	100.0					
		c	5	100.0					
		d	5	100.0					
NAV-OF14-SDB2-FF	10	a	3	60.0	80.0	16.3	88.9	0.180	No
		b	4	80.0					
		c	4	80.0					
		d	5	100.0					
	50	a	6	100.0	80.0	16.3	88.9	0.180	No
		b	4	80.0					
		c	3	60.0					
		d	4	80.0					
	100	a	2	40.0	70.0	25.8	77.8	0.114	No
		b	4	80.0					
		c	5	100.0					
		d	3	60.0					
NAV-OF14-SDB2-COMP	10	a	5	100.0	90.0	11.5	100.0	0.500	No
		b	5	100.0					
		c	4	80.0					
		d	4	80.0					
	50	a	5	100.0	95.0	10.0	105.6	0.269	No
		b	5	100.0					
		c	4	80.0					
		d	5	100.0					
	100	a	4	80.0	95.0	10.0	105.6	0.269	No
		b	5	100.0					
		c	5	100.0					
		d	5	100.0					

MYSIDS (*A. bahia*)

SAMPLE ID	CONC (%)	REP	SURVIVAL (#)	SURVIVAL (%)	MEAN SURVIVAL (%)	STD DEV	% of CONTROL[1]	P-VALUE[b]	SIG DIFF FROM CONTROL?
NAV-PR5-SDB2-FF	10	a	7	70.0	70.0	10.0	70.0	0.018	Yes
		b	8	80.0					
		c	6	60.0					
	50	a	0	0.0	0.0	0.0	0.0	0.000	Yes
		b	0	0.0					
		c	0	0.0					
	100	a	0	0.0	0.0	0.0	0.0	0.000	Yes
		b	0	0.0					
		c	0	0.0					
NAV-PR5-SDB2-COMP	10	a	10	100.0	100.0	0.0	100.0	n/a	No
		b	10	100.0					
		c	10	100.0					
	50	a	10	100.0	96.7	5.8	96.7	0.211	No
		b	10	100.0					
		c	9	90.0					
	100	a	10	100.0	100.0	0.0	100.0	n/a	No
		b	10	100.0					
		c	10	100.0					
NAV-PR6-SDB2-FF	10	a	10	100.0	100.0	0.0	100.0	n/a	No
		b	10	100.0					
		c	10	100.0					
	50	a	10	100.0	90.0	10.0	90.0	0.113	No
		b	8	80.0					
		c	9	90.0					
	100	a	2	20.0	33.3	15.3	33.3	0.009	Yes
		b	5	50.0					
		c	3	30.0					
NAV-PR6-SDB2-COMP	10	a	10	100.0	100.0	0.0	100.0	n/a	No
		b	10	100.0					
		c	10	100.0					
	50	a	9	90.0	96.7	5.8	96.7	0.211	No
		b	10	100.0					
		c	10	100.0					
	100	a	9	90.0	90.0	10.0	90.0	0.113	No
		b	8	80.0					
		c	10	100.0					
NAV-OF9-SDB2-FF	10	a	10	100.0	100.0	0.0	100.0	n/a	No
		b	10	100.0					
		c	10	100.0					
	50	a	9	90.0	93.3	5.8	93.3	0.092	No
		b	10	100.0					
		c	9	90.0					
	100	a	8	80.0	90.0	10.0	90.0	0.113	No
		b	10	100.0					
		c	9	90.0					
NAV-OF9-SDB2-COMP	10	a	10	100.0	100.0	0.0	100.0	n/a	No
		b	10	100.0					
		c	10	100.0					
	50	a	10	100.0	100.0	0.0	100.0	n/a	No
		b	10	100.0					
		c	10	100.0					
	100	a	10	100.0	100.0	0.0	100.0	n/a	No
		b	10	100.0					
		c	10	100.0					
NAV-OF11-SDB2-FF	10	a	10	100.0	100.0	0.0	100.0	n/a	No
		b	10	100.0					
		c	10	100.0					
	50	a	0	0.0	0.0	0.0	0.0	0.000	Yes
		b	0	0.0					
		c	0	0.0					
	100	a	0	0.0	0.0	0.0	0.0	0.000	Yes
		b	0	0.0					

MYSIDS (*A. bahia*)

SAMPLE ID	CONC (%)	REP	SURVIVAL (#)	SURVIVAL (%)	MEAN SURVIVAL (%)	STD DEV	% of CONTROL[1]	P-VALUE[b]	SIG DIFF FROM CONTROL?
NAV-OF11-SDB2-COMP	10	a	10	100.0	96.7	5.8	96.7	0.211	No
		b	9	90.0					
		c	10	100.0					
	50	a	10	100.0	100.0	0.0	100.0	n/a	No
		b	10	100.0					
		c	10	100.0					
	100	a	10	100.0	100.0	0.0	100.0	n/a	No
		b	10	100.0					
		c	10	100.0					
NAV-OF14-SDB2-FF	10	a	10	100.0	96.7	5.8	96.7	0.211	No
		b	10	100.0					
		c	9	90.0					
	50	a	10	100.0	93.3	11.5	93.3	0.211	No
		b	10	100.0					
		c	8	80.0					
	100	a	10	100.0	100.0	0.0	100.0	n/a	No
		b	10	100.0					
		c	10	100.0					
NAV-OF14-SDB2-COMP	10	a	10	100.0	100.0	0.0	100.0	n/a	No
		b	10	100.0					
		c	10	100.0					
	50	a	10	100.0	100.0	0.0	100.0	n/a	No
		b	10	100.0					
		c	10	100.0					
	100	a	10	100.0	100.0	0.0	100.0	n/a	No
		b	10	100.0					
		c	10	100.0					

MUSSELS (*M. galloprovincialis*)

SAMPLE ID	CONC (%)	REP.	# NORMAL	# ABNORMAL	NORM DEVEL (%)	MEAN NORM DEV (%)	STD DEV	% of CONTROL[1]	P-VALUE[b]	SIG DIFF FROM CONTROL?
NAV-PR5-SDB2-FF	10	a	96	4	96.0	95.4	2.7	107.7	0.020	Yes[c]
		b	91	9	91.0					
		c	97	3	97.0					
		d	95	5	95.0					
		e	98	2	98.0					
	50	a	7	93	7.0	12.0	9.2	13.5	0.000	Yes
		b	6	94	6.0					
		c	28	72	28.0					
		d	7	93	7.0					
		e	12	88	12.0					
	58	a	0	100	0.0	0.0	0.0	0.0	0.000	Yes
		b	0	100	0.0					
		c	0	100	0.0					
		d	0	100	0.0					
		e	0	100	0.0					
NAV-PR5-SDB2-COMP	10	a	96	4	96.0	95.8	1.9	108.1	0.016	Yes[c]
		b	97	3	97.0					
		c	95	5	95.0					
		d	98	2	98.0					
		e	93	7	93.0					
	50	a	95	5	95.0	95.6	1.3	107.9	0.018	Yes[c]
		b	95	5	95.0					
		c	95	5	95.0					
		d	98	2	98.0					
		e	95	5	95.0					
	58	a	13	87	13.0	38.6	21.7	43.6	0.003	Yes
		b	38	62	38.0					
		c	67	33	67.0					
		d	23	77	23.0					
		e	52	48	52.0					

MUSSELS (*M. galloprovincialis*)

SAMPLE ID	CONC (%)	REP.	# NORMAL	# ABNORMAL	NORM DEVEL (%)	MEAN NORM DEV (%)	STD DEV	% of CONTROL[1]	P-VALUE[b]	SIG DIFF FROM CONTROL?
NAV-PR6-SDB2-FF	10	a	96	4	96.0	94.4	4.2	106.5	0.045	Yes[c]
		b	95	5	95.0					
		c	97	3	97.0					
		d	97	3	97.0					
		e	87	13	87.0					
	50	a	0	100	0.0	0.0	0.0	0.0	0.000	Yes
		b	0	100	0.0					
		c	0	100	0.0					
		d	0	100	0.0					
		e	0	100	0.0					
	58	a	0	100	0.0	0.0	0.0	0.0	0.000	Yes
		b	0	100	0.0					
		c	0	100	0.0					
		d	0	100	0.0					
		e	0	100	0.0					
NAV-PR6-SDB2-COMP	10	a	99	1	99.0	97.2	2.2	109.7	0.008	Yes[c]
		b	96	4	96.0					
		c	96	4	96.0					
		d	95	5	95.0					
		e	100	0	100.0					
	50	a	99	1	99.0	95.6	3.2	107.9	0.019	Yes[c]
		b	98	2	98.0					
		c	94	6	94.0					
		d	96	4	96.0					
		e	91	9	91.0					
	58	a	0	100	0.0	0.4	0.5	0.5	0.000	Yes
		b	0	100	0.0					
		c	1	99	1.0					
		d	1	99	1.0					
		e	0	100	0.0					
NAV-OF9-SDB2-FF	10	a	98	2	98.0	97.4	0.9	101.0	0.141	No
		b	98	2	98.0					
		c	97	3	97.0					
		d	96	4	96.0					
		e	98	2	98.0					
	50	a	90	10	90.0	91.1	3.3	94.5	0.009	Yes[c]
		b	86	14	86.0					
		c	500	32	94.0					
		d	94	6	94.0					
		e	245	23	91.4					
	58	a	26	74	26.0	27.4	3.7	28.4	0.000	Yes
		b	34	66	34.0					
		c	26	74	26.0					
		d	26	74	26.0					
		e	25	75	25.0					
NAV-OF9-SDB2-COMP	10	a	96	4	96.0	96.4	1.5	100.0	0.500	No
		b	99	1	99.0					
		c	96	4	96.0					
		d	96	4	96.0					
		e	95	5	95.0					
	50	a	99	1	99.0	96.0	2.0	99.6	0.369	No
		b	246	13	95.0					
		c	97	3	97.0					
		d	95	5	95.0					
		e	94	6	94.0					
	61	a	100	0	100.0	96.8	2.3	100.4	0.380	No
		b	96	4	96.0					
		c	98	2	98.0					
		d	96	4	96.0					
		e	94	6	94.0					

MUSSELS (*M. galloprovincialis*)

SAMPLE ID	CONC (%)	REP.	# NORMAL	# ABNORMAL	NORM DEVEL (%)	MEAN NORM DEV (%)	STD DEV	% of CONTROL[1]	P-VALUE[b]	SIG DIFF FROM CONTROL?
NAV-OF11-SDB2-FF	10	a	92	8	92.0	95.0	2.6	99.6	0.389	No
		b	94	6	94.0					
		c	96	4	96.0					
		d	94	6	94.0					
		e	99	1	99.0					
	50	a	80	20	80.0	85.4	8.2	89.5	0.026	**Yes**
		b	94	6	94.0					
		c	74	26	74.0					
		d	230	24	90.6					
		e	229	30	88.4					
	58	a	0	100	0.0	0.0	0.0	0.0	0.000	**Yes**
		b	0	100	0.0					
		c	0	100	0.0					
		d	0	100	0.0					
		e	0	100	0.0					
NAV-OF11-SDB2-COMP	10	a	98	2	98.0	96.4	1.3	101.0	0.151	No
		b	97	3	97.0					
		c	95	5	95.0					
		d	97	3	97.0					
		e	95	5	95.0					
	50	a	98	2	98.0	96.0	2.0	100.6	0.304	No
		b	95	5	95.0					
		c	93	7	93.0					
		d	97	3	97.0					
		e	97	3	97.0					
	65	a	96	4	96.0	91.2	5.4	95.6	0.079	No
		b	93	7	93.0					
		c	82	18	82.0					
		d	92	8	92.0					
		e	93	7	93.0					
NAV-OF14-SDB2-FF	10	a	94	6	94.0	94.2	2.6	97.5	0.058	No
		b	93	7	93.0					
		c	91	9	91.0					
		d	98	2	98.0					
		e	95	5	95.0					
	50	a	95	5	95.0	95.0	3.0	98.3	0.161	No
		b	98	2	98.0					
		c	96	4	96.0					
		d	90	10	90.0					
		e	96	4	96.0					
	58	a	76	24	76.0	27.6	30.3	28.6	0.004	**Yes**
		b	5	95	5.0					
		c	11	89	11.0					
		d	7	93	7.0					
		e	39	61	39.0					
NAV-OF14-SDB2-COMP	10	a	99	1	99.0	96.2	2.2	99.6	0.368	No
		b	96	4	96.0					
		c	97	3	97.0					
		d	96	4	96.0					
		e	93	7	93.0					
	50	a	97	3	97.0	95.8	1.3	99.2	0.184	No
		b	94	6	94.0					
		c	96	4	96.0					
		d	97	3	97.0					
		e	95	5	95.0					
	65	a	94	6	94.0	94.8	2.3	98.1	0.088	No
		b	96	4	96.0					
		c	94	6	94.0					
		d	98	2	98.0					
		e	92	8	92.0					

[a]Controls (QA/QC) correspond to all samples from SDB2

[b]Student's t-test with a one tailed distribution and two sample unequal variance

[c] p-value is significant because treatment had a significantly greater proportion normal compared to the control

[1]Controls were the Bay water samples taken prior to storm (PRE) with comparable sample ID

[2]Controls were Scripps filtered seawater

[3]NAV-BAY14A-SDB2 PRE was used as a control for NAV-PR5-SDB2-FF, NAV-PR5-SDB2-COMP, NAV-PR6-SDB2-FF, NAV-PR6-SDB2-COMP

BAY SAMPLES

TOPSMELT (*A. affinis*)

SAMPLE ID	CONC (%)	REP	SURVIVAL (#)	SURVIVAL (%)	MEAN SURVIVAL (%)	STD DEV	% of CONTROL[2]	P-VALUE[b]	SIG DIFF FROM CONTROL?
NAV-BAY9-SDB2-PRE	100	a	5	100.0	100.0	0.0	102.6	0.196	No
		b	5	100.0					
		c	5	100.0					
		d	5	100.0					
NAV-BAY9-SDB2-DUR	100	a	4	80.0	95.0	10.0	82.1	0.338	No
		b	5	100.0					
		c	5	100.0					
		d	5	100.0					
NAV-BAY9-SDB2-AFT	100	a	5	100.0	90.0	20.0	102.6	0.257	No
		b	5	100.0					
		c	5	100.0					
		d	3	60.0					
NAV-BAY11-SDB2-PRE	100	a	4	80.0	95.0	10.0	82.1	0.338	No
		b	5	100.0					
		c	5	100.0					
		d	5	100.0					
NAV-BAY11-SDB2-DUR	100	a	5	100.0	90.0	11.5	102.6	0.149	No
		b	5	100.0					
		c	4	80.0					
		d	4	80.0					
NAV-BAY11-SDB2-AFT	100	a	5	100.0	95.0	10.0	102.6	0.338	No
		b	5	100.0					
		c	4	80.0					
		d	5	100.0					
NAV-BAY14-SDB2-PRE	100	a	5	100.0	90.0	11.5	102.6	0.149	No
		b	4	80.0					
		c	4	80.0					
		d	5	100.0					
NAV-BAY14-SDB2-DUR	100	a	4	80.0	90.0	11.5	82.1	0.149	No
		b	5	100.0					
		c	4	80.0					
		d	5	100.0					
NAV-BAY14-SDB2-AFT	100	a	4	80.0	90.0	11.5	82.1	0.149	No
		b	5	100.0					
		c	5	100.0					
		d	4	80.0					
NAV-BAY14A-SDB2-PRE	100	a	5	100.0	95.0	10.0	102.6	0.338	No
		b	5	100.0					
		c	5	100.0					
		d	4	80.0					
NAV-BAY14A-SDB2-DUR	100	a	5	100.0	90.0	11.5	102.6	0.149	No
		b	5	100.0					
		c	4	80.0					
		d	4	80.0					
NAV-BAY14A-SDB2-AFT	100	a	5	100.0	100.0	0.0	102.6	0.196	No
		b	5	100.0					
		c	5	100.0					
		d	5	100.0					

MYSIDS (*A. bahia*)

SAMPLE ID	CONC (%)	REP	SURVIVAL (#)	SURVIVAL (%)	MEAN SURVIVAL (%)	STD DEV	% of CONTROL[a]	P-VALUE[b]	SIG DIFF FROM CONTROL?
NAV-BAY9-SDB2-PRE	100	a	10	100.0	100.0	0.0	100.0	n/a	No
		b	10	100.0					
		c	10	100.0					
NAV-BAY9-SDB2-DUR	100	a	10	100.0	100.0	0.0	100.0	n/a	No
		b	10	100.0					
		c	10	100.0					
NAV-BAY9-SDB2-AFT	100	a	10	100.0	100.0	0.0	100.0	n/a	No
		b	10	100.0					
		c	10	100.0					
NAV-BAY11-SDB2-PRE	100	a	10	100.0	100.0	0.0	100.0	n/a	No
		b	10	100.0					
		c	10	100.0					
NAV-BAY11-SDB2-DUR	100	a	10	100.0	100.0	0.0	100.0	n/a	No
		b	10	100.0					
		c	10	100.0					
NAV-BAY11-SDB2-AFT	100	a	10	100.0	100.0	0.0	100.0	n/a	No
		b	10	100.0					
		c	10	100.0					
NAV-BAY14-SDB2-PRE	100	a	10	100.0	100.0	0.0	100.0	n/a	No
		b	10	100.0					
		c	10	100.0					
NAV-BAY14-SDB2-DUR	100	a	10	100.0	100.0	0.0	100.0	n/a	No
		b	10	100.0					
		c	10	100.0					
NAV-BAY14-SDB2-AFT	100	a	10	100.0	100.0	0.0	100.0	n/a	No
		b	10	100.0					
		c	10	100.0					
NAV-BAY14A-SDB2-PRE	100	a	10	100.0	100.0	0.0	100.0	n/a	No
		b	10	100.0					
		c	10	100.0					
NAV-BAY14A-SDB2-DUR	100	a	10	100.0	100.0	0.0	100.0	n/a	No
		b	10	100.0					
		c	10	100.0					
NAV-BAY14A-SDB2-AFT	100	a	9	90.0	97.0	5.8	97.0	0.211	No
		b	10	100.0					
		c	10	100.0					

MUSSELS (*M. galloprovincialis*)

SAMPLE ID	CONC (%)	REP.	# NORMAL	# ABNORMAL	NORM DEVEL (%)	MEAN NORM DEV (%)	STD DEV	% of CONTROL[a]	P-VALUE[b]	SIG DIFF FROM CONTROL?
NAV-BAY9-SDB2-PRE	100	a	97	3	97.0	96.4	1.7	100.2	0.457	No
		b	95	5	95.0					
		c	95	5	95.0					
		d	99	1	99.0					
		e	96	4	96.0					
NAV-BAY9-SDB2-DUR	100	a	89	11	89.0	92.8	2.6	96.5	0.063	No
		b	93	7	93.0					
		c	96	4	96.0					
		d	94	6	94.0					
		e	92	8	92.0					
NAV-BAY9-SDB2-AFT	100	a	96	4	96.0	97.4	2.4	101.2	0.276	No
		b	98	2	98.0					
		c	100	0	100.0					
		d	94	6	94.0					
		e	99	1	99.0					

MUSSELS (*M. galloprovincialis*)

SAMPLE ID	CONC (%)	REP.	# NORMAL	# ABNORMAL	NORM DEVEL (%)	MEAN NORM DEV (%)	STD DEV	% of CONTROL[a]	P-VALUE[b]	SIG DIFF FROM CONTROL?
NAV-BAY11-SDB2-PRE	100	a	96	4	96.0	95.4	1.5	99.2	0.331	No
		b	97	3	97.0					
		c	93	7	93.0					
		d	95	5	95.0					
		e	96	4	96.0					
NAV-BAY11-SDB2-DUR	100	a	96	4	96.0	96.2	0.8	100.0	0.500	No
		b	95	5	95.0					
		c	97	3	97.0					
		d	96	4	96.0					
		e	97	3	97.0					
NAV-BAY11-SDB2-AFT	100	a	97	3	97.0	97.4	1.1	101.2	0.253	No
		b	97	3	97.0					
		c	99	1	99.0					
		d	96	4	96.0					
		e	98	2	98.0					
NAV-BAY14-SDB2-PRE	100	a	98	2	98.0	96.6	1.3	100.4	0.412	No
		b	95	5	95.0					
		c	98	2	98.0					
		d	96	4	96.0					
		e	96	4	96.0					
NAV-BAY14-SDB2-DUR	100	a	96	4	96.0	96.4	1.8	100.2	0.457	No
		b	99	1	99.0					
		c	94	6	94.0					
		d	97	3	97.0					
		e	96	4	96.0					
NAV-BAY14-SDB2-AFT	100	a	98	2	98.0	97.2	2.4	101.0	0.309	No
		b	98	2	98.0					
		c	98	2	98.0					
		d	93	7	93.0					
		e	99	1	99.0					
NAV-BAY14A-SDB2-PRE	100	a	89	11	89.0	88.6	5.2	92.1	0.015	Yes
		b	81	19	81.0					
		c	87	13	87.0					
		d	95	5	95.0					
		e	91	9	91.0					
NAV-BAY14A-SDB2-DUR	100	a	99	1	99.0	92.6	8.5	96.3	0.210	No
		b	98	2	98.0					
		c	93	7	93.0					
		d	95	5	95.0					
		e	78	22	78.0					
NAV-BAY14A-SDB2-AFT	100	a	97	3	97.0	91.2	5.1	94.8	0.058	No
		b	87	13	87.0					
		c	95	5	95.0					
		d	92	8	92.0					
		e	85	15	85.0					

QA/QC SAMPLES[a]

TOPSMELT (*A. affinis*)

SAMPLE ID	CONC (% or µg/l Cu)	REP	SURVIVAL (#)	SURVIVAL (%)	MEAN SURVIVAL (%)	STD DEV	% of CONTROL	P-VALUE[b]	SIG DIFF FROM CONTROL?
Natural Seawater Control	n/a	a	10	100.0	97.5	97.5	n/a	n/a	n/a
		b	10	100.0					
		c	10	100.0					
		d	9	90.0					
Salt Control 1	n/a	a	10	100.0	100.0	100.0	102.6	0.196	No
		b	10	100.0					
		c	10	100.0					
		d	10	100.0					
Salt Control 2	n/a	a	8	80.0	87.5	87.5	89.7	0.015	Yes
		b	9	90.0					
		c	9	90.0					
		d	9	90.0					

MYSIDS (*A. bahia*)

SAMPLE ID	CONC (% or µg/l Cu)	REP	SURVIVAL (#)	SURVIVAL (%)	MEAN SURVIVAL (%)	STD DEV	% of CONTROL[2]	P-VALUE[b]	SIG DIFF FROM CONTROL?
Natural Seawater Control	n/a	a	10	100.0	100.0	0.0	100.0	n/a	n/a
		b	10	100.0					
		c	10	100.0					
Salt Control 1	n/a	a	10	100.0	100.0	0.0	100.0	n/a	No
		b	10	100.0					
		c	10	100.0					
Salt Control 2	n/a	a	10	100.0	100.0	0.0	100.0	n/a	No
		b	10	100.0					
		c	10	100.0					

MUSSELS (*M. galloprovincialis*)

SAMPLE ID	CONC (% or µg/l Cu)	REP.	# NORMAL	# ABNORMAL	NORM DEVEL (%)	MEAN NORM DEV (%)	STD DEV	% of CONTROL[2]	P-VALUE[b]	SIG DIFF FROM CONTROL?
Natural Seawater Control	n/a	a	99	1	99.0	96.2	3.6	n/a	n/a	n/a
		b	97	3	97.0					
		c	92	8	92.0					
		d	100	0	100.0					
		e	93	7	93.0					
Brine Control	n/a	a	98	2	98.0	94.4	3.3	98.1	0.215	No
		b	91	9	91.0					
		c	91	9	91.0					
		d	95	5	95.0					
		e	97	3	97.0					

SUMMARY RESULTS- QA/QC

COPPER REFERENCE TOXICANT TEST

SPECIES	DATE	NOEC (µg/l)	LOEC (µg/l)	EC50 (µg/l)	95% C.L. (µg/l)
TOPSMELT	2/25/2003	100.0	200.0	161.5	135.2-193.3
MYSIDS	2/26/2003	100.0	200.0	237.4	212.4-266.0
MUSSELS	2/27/2003	5.0	10.0	7.54	n/a

Reference Toxicant tests are within two standard deviations of Nautilus' control chart mean

[a]Controls (QA/QC) correspond to all samples from SDB2

[b]Student's t-test with a one tailed distribution and two sample unequal variance

[c] p-value is significant because treatment had a significantly greater proportion normal compared to the control
n/a - t-test not used since control and treatment have same percentage survival

[1]Controls were the Bay water samples taken prior to storm (PRE) with comparable sample ID

[2]Controls were Scripps filtered seawater

WATER QUALITY

TOPSMELT (*A. affinis*)

SAMPLE ID	Effluent Concentration (% or µg/l Cu)	pH (SU)					Dissolved Oxygen (mg/l)					Temperature (°C)					Salinity (‰)		
		0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	96
NAV-PR5-SDB2-FF	10%	8.1	7.9	8.2	7.6	7.7	7.4	6.6	7.7	7.8	7.0	20.1	20.3	20.1	20.3	20.1	33.0	33.0	33.0
	50%	8.4	8.0	8.4	7.7	7.7	8.0	6.0	8.1	7.5	6.0	20.3	20.3	20.3	20.1	20.1	33.0	33.0	33.0
	100%	8.6	8.2	N	N	N	7.5	5.3	N	N	N	20.3	20.2	N	N	N	33.0	33.0	N
NAV-PR5-SDB2-COMP	10%	8.1	7.9	8.2	7.6	7.7	7.5	6.8	8.4	8.1	7.0	19.9	20.2	20.1	20.4	19.9	33.0	32.0	33.0
	50%	8.4	8.0	8.4	7.7	7.7	7.6	6.6	8.6	7.9	6.8	20.0	20.2	20.1	20.1	20.0	33.0	33.0	33.0
	100%	8.6	8.3	8.6	7.8	7.8	7.6	6.3	8.5	7.1	6.6	20.3	20.2	21.0	20.0	20.0	33.0	33.0	33.0
NAV-PR6-SDB2-FF	10%	8.1	7.8	8.2	7.5	7.6	7.5	6.4	7.5	7.4	6.1	19.8	20.3	19.9	20.4	20.1	33.0	33.0	33.0
	50%	8.4	7.8	8.4	7.5	7.6	8.0	5.8	8.0	5.6	5.5	20.1	20.3	20.2	20.1	20.1	33.0	33.0	33.0
	100%	8.5	7.9	8.6	7.8	7.9	8.2	4.2[A]	8.5	7.9	6.6	20.7	20.2	20.7	20.1	20.1	33.0	33.0	34.0
NAV-PR6-SDB2-COMP	10%	8.1	7.9	8.2	7.5	7.7	7.5	6.6	7.5	7.6	6.6	20.7	20.2	20.2	20.1	20.0	33.0	32.0	32.0
	50%	8.4	7.7	8.4	7.6	7.7	7.8	6.4	8.2	6.8	6.6	20.1	20.1	20.3	19.9	20.0	33.0	33.0	33.0
	100%	8.6	8.2	8.6	7.7	7.8	7.9	6.0	8.5	6.0	6.3	20.1	20.0	20.9	19.9	20.0	33.0	33.0	33.0
NAV-OF9-SDB2-FF	10%	8.1	7.9	8.2	7.6	7.7	7.2	6.5	7.9	7.5	6.6	19.9	20.3	20.9	20.1	20.1	33.0	33.0	33.0
	50%	8.3	8.0	8.4	7.6	7.7	7.3	6.2	8.2	7.7	6.6	20.0	20.3	20.9	20.1	20.1	33.0	33.0	33.0
	100%	8.5	8.1	8.6	7.7	7.8	7.5	5.8	8.2	6.8	6.4	20.3	20.2	20.6	20.0	20.1	33.0	33.0	33.0
NAV-OF9-SDB2-COMP	10%	8.1	7.9	8.2	7.6	7.5	7.5	6.5	8.2	7.8	6.8	20.1	20.3	20.3	20.0	20.0	33.0	33.0	33.0
	50%	8.3	8.0	8.4	7.7	7.6	7.7	6.6	8.3	7.3	6.7	20.1	20.3	20.3	20.0	20.0	33.0	33.0	33.0
	100%	8.5	8.2	8.6	7.8	7.6	7.7	6.5	8.4	7.0	6.9	20.3	20.2	21.0	19.9	20.0	33.0	33.0	33.0
NAV-OF11-SDB2-FF	10%	8.1	7.9	8.2	7.5	7.7	7.1	6.6	7.9	7.6	6.7	20.4	20.2	20.3	20.1	20.0	33.0	33.0	32.0
	50%	8.4	8.1	8.6	7.6	7.7	7.2	6.6	8.5	5.5	6.0	20.3	20.2	20.8	19.9	20.0	33.0	33.0	32.0
	100%	8.6	8.3	N	N	N	7.4	6.0	N	N	N	20.3	20.1	N	N	N	33.0	33.0	N
NAV-OF11-SDB2-COMP	10%	8.0	7.9	8.2	7.6	7.7	7.8	6.9	8.1	7.9	6.8	19.8	20.3	20.4	20.2	20.1	33.0	33.0	33.0
	50%	8.3	8.0	8.3	7.7	7.7	7.9	6.8	8.2	8.0	6.9	19.9	20.3	20.6	20.1	20.1	34.0	34.0	34.0
	100%	8.4	8.1	8.5	7.7	7.8	7.9	6.6	8.2	6.5	6.5	20.3	20.2	21.0	20.0	20.0	35.0	35.0	35.0
NAV-OF14-SDB2-FF	10%	8.1	7.9	8.2	7.6	7.7	7.4	7.0	8.4	8.1	7.1	20.5	20.2	20.1	20.4	20.3	33.0	32.0	32.0
	50%	8.4	8.0	8.4	7.6	7.7	7.7	6.1	8.7	7.1	6.4	20.3	20.2	20.1	20.3	20.1	33.0	32.0	33.0
	100%	8.5	8.2	8.6	7.9	8.0	7.9	5.4	8.7	8.8	7.4	20.5	20.1	20.0	20.3	20.1	33.0	33.0	34.0
NAV-OF14-SDB2-COMP	10%	8.0	7.9	8.2	7.6	7.7	7.3	7.0	8.3	7.7	6.7	20.5	20.3	20.4	20.1	20.0	33.0	32.0	32.0
	50%	8.3	7.9	8.4	7.6	7.7	7.5	6.7	8.5	7.7	6.8	20.5	20.2	20.8	20.0	20.0	33.0	33.0	33.0
	100%	8.5	8.2	8.5	7.8	7.8	7.8	6.7	8.4	7.2	6.4	20.5	20.1	21.0	19.9	20.0	33.0	33.0	33.0
NAV-BAY9-SDB2-PRE	100%	8.0	7.8	8.0	7.6	7.6	8.2	6.8	8.4	8.1	6.7	19.9	20.3	20.7	20.4	20.5	33.0	33.0	32.0
NAV-BAY11-SDB2-PRE	100%	8.0	7.8	8.1	7.5	7.6	8.1	6.8	8.0	7.8	6.7	19.8	20.4	20.9	20.5	20.5	33.0	33.0	32.0
NAV-BAY14-SDB2-PRE	100%	8.0	7.9	8.1	7.5	7.5	7.8	6.5	8.3	7.4	6.4	19.9	20.5	20.2	20.6	20.5	33.0	33.0	32.0
NAV-BAY14A-SDB2-PRE	100%	8.0	7.8	8.1	7.6	7.6	8.0	6.8	8.4	7.9	6.7	19.7	20.5	20.7	20.6	20.5	33.0	33.0	32.0
NAV-BAY9-SDB2-DUR	100%	7.9	7.8	7.9	7.5	7.6	7.0	6.5	8.3	7.8	6.5	20.5	20.5	20.2	20.4	20.4	31.0	31.0	31.0
NAV-BAY11-SDB2-DUR	100%	8.0	7.8	8.1	7.5	7.6	8.2	6.4	8.5	7.7	6.6	20.1	20.4	19.7	20.4	20.4	31.0	31.0	31.0
NAV-BAY14-SDB2-DUR	100%	8.0	7.8	8.1	7.5	7.6	8.1	6.7	8.4	7.7	6.6	20.0	20.4	20.1	20.5	20.4	32.0	32.0	32.0
NAV-BAY14A-SDB2-DUR	100%	8.0	7.8	8.1	7.5	7.6	8.2	6.6	8.5	7.4	6.5	19.9	20.4	20.1	20.5	20.4	32.0	32.0	32.0
NAV-BAY9-SDB2-AFT	100%	8.0	7.8	8.1	7.5	7.6	8.1	6.8	8.5	7.8	6.8	20.1	20.5	20.1	20.4	20.4	31.0	31.0	31.0
NAV-BAY11-SDB2-AFT	100%	8.0	7.8	8.1	7.5	7.6	8.0	6.7	8.6	8.0	6.8	20.1	20.4	19.9	20.4	20.3	31.0	31.0	31.0
NAV-BAY14-SDB2-AFT	100%	8.0	7.8	8.1	7.6	7.6	8.1	6.7	8.3	8.3	6.9	20.0	20.4	20.3	20.4	20.3	32.0	32.0	32.0
NAV-BAY14A-SDB2-AFT	100%	8.0	7.8	8.1	7.5	7.6	8.1	6.7	8.4	8.1	6.7	19.7	20.5	20.0	20.4	20.3	32.0	32.0	32.0
Natural Seawater Control	100%	7.8	7.8	7.9	7.5	7.5	8.7	6.5	8.9	7.6	6.5	20.1	20.3	19.2	20.4	20.4	33.0	33.0	33.0
Salt Control	100%	7.5	8.4	8.8	7.6	7.7	7.4	5.7	7.1	6.1	6.2	21.0	20.4	20.7	20.3	20.1	33.0	33.0	33.0

MYSIDS (*A. bahia*)

SAMPLE ID	Effluent Concentration (% or µg/l Cu)	pH (SU)					Dissolved Oxygen (mg/l)					Temperature (°C)					Salinity (‰)		
		0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	96
NAV-PR5-SDB2-FF	10%	8.1	8.1	8.1	7.9	7.9	8.1	6.3	8.3	5.8	6.0	20.5	20.4	20.1	19.7	19.3	32.0	33.0	33.0
	50%	8.5	8.1	8.3	N	N	8.4	5.0	8.6	N	N	20.8	20.3	20.3	N	N	33.0	33.0	N
	100%	8.5	8.3	8.5	N	N	8.8	4.1[A]	9.5	N	N	21.0	20.3	19.0	N	N	33.0	33.0	N
NAV-PR5-SDB2-COMP	10%	8.1	8.1	8.1	7.9	7.9	8.2	6.3	8.2	5.7	5.9	20.7	20.5	20.3	20.4	20.1	32.0	32.0	32.0
	50%	8.3	8.2	8.3	8.0	8.0	8.2	5.8	8.6	5.4	5.7	20.2	20.4	20.4	20.4	20.3	33.0	33.0	33.0
	100%	8.5	8.3	8.5	8.1	8.0	8.4	5.2	9.1	5.2	5.0	20.7	20.3	20.6	20.3	20.3	33.0	33.0	33.0
NAV-PR6-SDB2-FF	10%	8.1	7.9	8.1	7.8	7.8	8.2	4.9	8.3	5.4	6.0	20.2	20.4	20.3	19.9	19.7	33.0	33.0	32.0
	50%	8.3	7.8	8.3	8.2	8.1	8.5	2.3[A]	8.8	7.2	6.6	20.3	20.4	20.3	19.2	19.6	33.0	33.0	35.0
	100%	8.5	7.9	8.5	8.2	8.1	8.8	1.2[A]	9.6	7.3	6.8	20.7	20.3	19.0	19.3	19.4	33.0	33.0	35.0
NAV-PR6-SDB2-COMP	10%	8.1	8.0	8.1	7.9	7.9	8.1	6.0	8.2	5.6	5.7	20.5	20.7	20.3	20.3	20.1	33.0	32.0	32.0
	50%	8.3	8.1	8.3	7.9	8.0	8.4	5.4	8.5	5.3	5.3	20.8	20.5	20.5	20.3	20.1	33.0	33.0	33.0
	100%	8.5	8.2	8.5	8.3	8.3	8.5	3.8[A]	9.5	6.9	6.9	21.0	20.4	19.3	20.1	20.0	33.0	33.0	34.0
NAV-OF9-SDB2-FF	10%	8.0	8.1	8.1	7.9	7.9	7.7	6.3	7.7	6.0	5.3	20.7	20.3	20.7	19.8	20.0	33.0	33.0	32.0
	50%	8.3	8.1	8.3	8.1	8.1	7.9	5.3[A]	8.2	7.1	6.7	21.0	20.3	20.8	19.7	19.6	33.0	33.0	34.0
	100%	8.5	8.2	8.4	8.2	8.1	8.6	3.5[A]	9.0	7.3	6.9	21.0	20.3	20.3	19.6	19.6	33.0	33.0	35.0
NAV-OF9-SDB2-COMP	10%	8.1	8.1	8.1	8.0	8.0	7.7	6.3	8.1	5.8	5.8	19.8	20.3	19.7	20.2	19.9	33.0	33.0	33.0
	50%	8.3	8.1	8.2	8.0	8.0	8.1	5.7	8.4	5.7	5.7	19.9	20.3	20.1	20.1	19.9	33.0	33.0	33.0
	100%	8.5	8.3	8.3	8.1	8.1	8.5	5.7	9.1	5.2	5.2	20.0	20.1	19.9	20.1	20.0	33.0	33.0	33.0
NAV-OF11-SDB2-FF	10%	8.1	8.1	8.1	7.9	7.9	7.7	6.1	8.0	5.6	5.4	20.1	20.4	20.6	20.0	19.9	33.0	32.0	33.0
	50%	8.4	8.2	8.3	8.0	N	8.0	5.5	8.5	5.9	N	20.6	20.3	20.3	20.0	N	33.0	33.0	N
	100%	8.5	8.3	8.5	N	N	8.6	4.6[A]	9.6	N	N	20.8	20.3	19.0	N	N	33.0	33.0	N
	10%	8.1	7.9	8.1	7.9	7.9	7.8	6.3	8.1	6.1	6.1	20.5	20.6	19.8	20.3	20.3	33.0	33.0	32.0
	50%	8.2	8.1	8.2	7.9	8.0	8.1	6.3	8.5	5.7	5.7	20.6	20.4	19.9	20.3	20.3	34.0	34.0	33.0
	100%	8.4	8.2	8.3	8.1	8.0	8.4	5.7	9.0	5.4	5.3	20.9	20.3	19.4	20.3	20.3	35.0	35.0	34.0
NAV-OF14-SDB2-FF	10%	8.1	8.1	8.1	7.8	7.9	8.2	6.2	8.7	5.7	5.7	20.4	20.4	20.1	19.9	19.9	32.0	33.0	32.0
	50%	8.3	8.1	8.3	7.9	8.0	8.4	4.7[A]	8.9	6.7	6.8	20.7	20.3	20.1	19.9	19.5	33.0	33.0	34.0
	100%	8.5	8.2	8.5	8.1	8.1	8.6	3.1[A]	9.7	7.1	6.8	21.0	20.3	19.0	19.7	19.4	33.0	33.0	34.0
NAV-OF14-SDB2-COMP	10%	8.1	8.0	8.0	7.9	7.9	8.1	6.3	8.0	6.0	6.2	20.5	20.6	19.9	20.4	19.9	32.0	32.0	32.0
	50%	8.3	8.1	8.2	8.0	8.0	8.2	6.3	8.8	5.7	5.7	20.7	20.5	20.0	20.4	20.3	33.0	33.0	33.0
	100%	8.5	8.3	8.4	8.1	8.1	8.4	5.7	9.4	5.2	5.6	20.7	20.4	19.7	20.3	20.3	33.0	33.0	33.0
NAV-BAY9-SDB2-PRE	100%	7.7	8.1	7.9	7.9	8.0	8.1	8.4	9.3	6.1	6.2	21.0	20.7	21.0	20.3	19.9	33.0	33.0	33.0
NAV-BAY11-SDB2-PRE	100%	7.9	8.1	7.9	7.9	7.9	8.1	8.0	9.2	6.0	6.2	21.0	20.9	21.0	20.2	20.0	32.0	33.0	32.0
NAV-BAY14-SDB2-PRE	100%	7.8	8.1	7.9	7.9	7.9	8.2	8.0	9.8	6.2	6.4	21.0	20.9	21.0	20.2	19.9	32.0	33.0	33.0
NAV-BAY14A-SDB2-PRE	100%	7.9	8.1	7.9	7.8	7.9	8.2	8.4	6.1	5.8	6.2	21.0	20.7	20.3	19.8	19.9	32.0	32.0	32.0
NAV-BAY9-SDB2-DUR	100%	8.0	8.0	8.0	7.9	7.9	8.0	6.7	10.0	6.3	6.3	21.0	20.3	19.5	20.0	19.9	31.0	31.0	31.0
NAV-BAY11-SDB2-DUR	100%	8.0	8.0	8.0	7.9	7.9	8.1	6.4	10.0	6.3	6.3	20.5	20.3	20.3	20.0	19.7	31.0	31.0	31.0
NAV-BAY14-SDB2-DUR	100%	8.0	8.0	7.9	7.9	7.9	8.1	6.6	10.0	6.3	6.1	20.8	20.1	19.5	19.9	19.7	32.0	32.0	32.0
NAV-BAY14A-SDB2-DUR	100%	8.0	8.0	8.0	7.9	7.9	7.9	6.5	9.9	6.4	6.3	21.0	20.1	19.9	19.9	19.8	32.0	32.0	32.0
NAV-BAY9-SDB2-AFT	100%	8.0	7.9	8.0	7.9	7.9	8.0	6.5	9.0	6.2	5.9	21.0	20.6	19.3	20.1	19.9	31.0	31.0	31.0
NAV-BAY11-SDB2-AFT	100%	8.0	8.0	8.0	7.9	7.9	8.0	6.6	9.0	6.2	6.0	20.4	20.4	19.9	20.1	20.0	31.0	31.0	31.0
NAV-BAY14-SDB2-AFT	100%	8.0	8.0	8.0	7.9	7.9	7.9	6.6	9.3	6.3	6.1	21.0	20.3	19.3	20.1	20.0	31.0	31.0	31.0
NAV-BAY14A-SDB2-AFT	100%	8.0	8.0	8.0	7.9	7.9	7.9	6.4	9.3	6.3	6.1	20.5	20.3	19.0	20.1	20.0	32.0	32.0	32.0
Natural Seawater Control	100%	7.9	7.9	7.9	7.9	7.9	8.0	6.7	8.9	6.5	6.1	21.0	20.3	20.8	20.1	19.9	33.0	33.0	33.0
Salt Control	100%	8.4	8.3	8.2	8.1	8.0	7.1	5.9	8.2	5.5	5.9	21.0	20.3	20.4	19.8	20.0	33.0	33.0	33.0

MUSSELS (*M. galloprovincialis*)

SAMPLE ID	Effluent Concentration (% or µg/l Cu)	pH (SU)		D.O. (mg/l)		Temp (°C)		Salinity (‰)	
		0	48	0	48	0	48	0	48
NAV-OF9-SDB2-FF	100%	7.9	7.9	9.5	8.1	15.2	15.5	33.0	33.0
NAV-OF9-SDB2-COMP	100%	7.9	8.0	9.5	8.4	15.2	15.1	33.0	34.0
NAV-OF11-SDB2-FF	100%	7.9	8.0	9.4	8.3	15.2	15.5	33.0	33.0
NAV-OF11-SDB2-COMP	100%	7.9	8.1	9.0	8.3	15.2	15.0	32.0	34.0
NAV-OF14-SDB2-FF	100%	7.9	8.0	9.5	8.3	15.2	15.2	33.0	34.0
NAV-OF14-SDB2-COMP	100%	7.9	8.1	9.5	8.3	15.2	15.0	32.0	34.0
NAV-PR5-SDB2-COMP	100%	7.9	8.1	9.4	8.4	15.2	14.9	33.0	36.0
NAV-PR6-SDB2-COMP	100%	7.9	8.0	9.5	8.4	15.2	14.9	33.0	34.0
NAV-BAY9-SDB2-PRE	100%	8.0	7.9	9.5	8.3	15.2	14.7	32.0	33.0
NAV-BAY11-SDB2-PRE	100%	8.0	7.9	9.4	8.1	15.2	14.7	32.0	33.0
NAV-BAY14-SDB2-PRE	100%	8.0	8.0	9.2	8.3	15.2	14.6	32.0	33.0
NAV-BAY14A-SDB2-PRE	100%	8.0	8.0	9.2	8.4	15.2	14.6	32.0	33.0
NAV-BAY9-SDB2-DUR	100%	8.0	8.0	9.4	8.3	15.2	14.6	31.0	31.0
NAV-BAY11-SDB2-DUR	100%	8.0	8.0	9.5	8.4	15.2	14.6	31.0	32.0
NAV-BAY14-SDB2-DUR	100%	8.0	8.0	9.4	8.4	15.2	14.6	31.0	32.0
NAV-BAY14A-SDB2-DUR	100%	8.0	8.0	9.4	8.4	15.2	14.6	32.0	32.0
NAV-BAY9-SDB2-AFT	100%	8.0	8.0	9.4	8.3	15.2	14.8	31.0	31.0
NAV-BAY11-SDB2-AFT	100%	8.0	8.0	9.3	8.4	15.2	14.6	31.0	32.0
NAV-BAY14-SDB2-AFT	100%	8.0	8.0	9.4	8.3	15.2	14.6	31.0	32.0
NAV-BAY14A-SDB2-AFT	100%	8.0	8.0	9.3	8.3	15.2	14.6	31.0	32.0
Natural Seawater Control	100%	8.0	8.0	8.3	8.4	15.2	14.6	33.0	34.0
Brine Control	100%	7.9	8.0	7.8	8.4	15.2	14.2	33.0	34.0

N - water quality not taken due to 100% mortality in treatment

[A] Sample mg/L was aerated due to D.O. near 4.0 mg/L

TIE1 – 02/18/2004

OUTFALLS

INLAND SILVERSIDE (*M. berylina*)

SAMPLE ID	CONC (%)	MEAN SURVIVAL (%)
NAV-OF9-TIE1-FF	25	100.0
	50	100.0
	100	96.0
NAV-OF11-TIE1-FF	25	100.0
	50	96.0
	100	100.0
NAV-OF14-TIE1-FF	25	100.0
	50	100.0
	100	100.0

MYSIDS (*A. bahia*)

SAMPLE ID	CONC (%)	MEAN SURVIVAL (%)
NAV-OF9-TIE1-FF	10	100.0
	50	93.0
	100	90.0
NAV-OF11-TIE1-FF	25	100.0
	50	98.0
	100	85.0
NAV-OF14-TIE1-FF	25	93.0
	50	98.0
	100	85.0

MUSSELS (*M. galloprovincialis*)

SAMPLE ID	CONC (%)	MEAN NORM DEV (%)
NAV-OF9-TIE1-FF	13	82.0
	25	81.0
	50	1.0
	68	0.0
NAV-OF11-TIE1-FF	13	77.0
	25	79.0
	50	0.0
	68	0.0
NAV-OF14-TIE1-FF	13	77.0
	25	61.0
	50	0.0
	68	0.0

Please refer to TIE Report August 2004 for raw data and water quality

QA/QC SAMPLES[a]

INLAND SILVERSIDE (*M. berylina*)

SAMPLE ID	CONC (% or µg/l Cu)	MEAN SURVIVAL (%)
Natural Seawater Control	n/a	100.0
Salt Control	n/a	96.0

MYSIDS (*A. bahia*)

SAMPLE ID	CONC (% or µg/l Cu)	MEAN SURVIVAL (%)
Natural Seawater Control	n/a	95.0
Salt Control	n/a	100.0

MUSSELS (*M. galloprovincialis*)

SAMPLE ID	CONC (% or µg/l Cu)	MEAN NORM DEV (%)
Natural Seawater Control	n/a	81.0
Brine Control	n/a	80.0

SUMMARY RESULTS- QA/QC

COPPER REFERENCE TOXICANT TEST

SPECIES	DATE	NOEC (µg/l)	LOEC (µg/l)	EC50 (µg/l)	95% C.L. (µg/l)
INLAND SILVERSIDE	02/26/004	100	200	137.6	129.5-146.2
MYSIDS	2/27/2004	200	400	337.1	242.4-438.7
MUSSELS	2/19/2004	5	10	10.2	9.9-10.5

Please refer to TIE Report August 2004 for raw data and water quality

SDB4 – 10/17/2004

OUTFALLS

TOPSMELT (*A. affinis*)

SAMPLE ID	CONC (%)	REP	SURVIVAL (#)	SURVIVAL (%)	MEAN SURVIVAL (%)	STD DEV	% of CONTROL[1]	P-VALUE[b]	SIG DIFF FROM CONTROL?
NAV-OF14-SDB4-FF	12.5	a	5	100	100.0	0.0	100.0	n/a	No
		b	5	100					
		c	5	100					
		d	5	100					
	25	a	5	100	100.0	19.1	100.0	0.108	No
		b	4	100					
		c	3	100					
		d	5	100					
	50	a	5	100	80.0	28.3	80.0	0.126	No
		b	5	100					
		c	2	40					
		d	4	80					
	100	a	1	20	25.0	19.1	25.0	0.002	Yes
		b	2	40					
		c	2	40					
		d	0	0					

MYSIDS (*A. bahia*)

SAMPLE ID	CONC (%)	REP	SURVIVAL (#)	SURVIVAL (%)	MEAN SURVIVAL (%)	STD DEV	% of CONTROL[1]	P-VALUE[b]	SIG DIFF FROM CONTROL?
NAV-OF14-SDB4-FF	12.5	a	9	90	96.7	5.8	96.7	0.211	No
		b	10	100					
		c	10	100					
	25	a	10	100	100.0	0.0	100.0	n/a	No
		b	10	100					
		c	10	100					
	50	a	8	80	86.7	11.5	86.7	0.211	No
		b	8	80					
		c	10	100					
	100	a	4	40	43.3	5.8	43.3	0.002	Yes
		b	4	40					
		c	5	50					

MUSSELS (*M. galloprovincialis*)

SAMPLE ID	CONC (%)	REP.	# NORMAL	# ABNORMAL	NORM DEVEL (%)	MEAN NORM DEV (%)	STD DEV	% of CONTROL[1]	P-VALUE[b]	SIG DIFF FROM CONTROL?
NAV-OF14-SDB4-FF	6.25	a	103	23	81.7	75.5	12.5	77.4	0.012	Yes
		b	123	37	76.9					
		c	143	58	71.1					
		d	142	15	90.4					
		e	105	79	57.1					
	12.5	a	29	136	17.6	7.1	6.5	7.3	0.000	Yes
		b	2	174	1.1					
		c	4	160	2.4					
		d	12	149	7.5					
		e	9	124	6.8					
	25	a	1	180	0.6	1.8	1.3	1.8	0.000	Yes
		b	3	164	1.8					
		c	7	171	3.9					
		d	2	151	1.3					
		e	2	163	1.2					
	50	a	0	196	0.0	0.0	0.0	0.0	0.000	Yes
		b	0	196	0.0					
		c	0	196	0.0					
		d	0	196	0.0					
		e	0	196	0.0					
	62.7	a	0	196	0.0	0.0	0.0	0.0	0.000	Yes
		b	0	196	0.0					
		c	0	196	0.0					
		d	0	196	0.0					
		e	0	196	0.0					

[a]Controls (QA/QC) correspond to all samples from SDB4

[b]Student's t-test with a one tailed distribution and two sample unequal variance

[c] p-value is significant because treatment had a significantly greater proportion normal compared to the control

n/a - t-test not used since control and treatment have same percentage survival

[1]Controls were the Bay water samples taken during the storm (DUR) with comparable sample ID

[2]Controls were Scripps filtered seawater

BAY SAMPLES

TOPSMELT (*A. affinis*)

SAMPLE ID	CONC (%)	REP	SURVIVAL (#)	SURVIVAL (%)	MEAN SURVIVAL (%)	STD DEV	% of CONTROL[2]	P-VALUE[b]	SIG DIFF FROM CONTROL?
NAV-BAY14-SDB4-DUR	100	a	5	100.0	100.0	0.0	100.0	n/a	No
		b	5	100.0					
		c	5	100.0					
		d	5	100.0					
ALL-BAY-SDB4-PRE	100	a	5	100.0	100.0	0.0	100.0	n/a	-
		b	5	100.0					
		c	5	100.0					
		d	5	100.0					

MYSIDS (*A. bahia*)

SAMPLE ID	CONC (%)	REP	SURVIVAL (#)	SURVIVAL (%)	MEAN SURVIVAL (%)	STD DEV	% of CONTROL[2]	P-VALUE[b]	SIG DIFF FROM CONTROL?
NAV-BAY14-SDB4-DUR	100	a	10	100.0	100.0	0.0	100.0	n/a	No
		b	10	100.0					
		c	10	100.0					
ALL-BAY-SDB4-PRE	100	a	10	100.0	100.0	0.0	100.0	n/a	-
		b	10	100.0					
		c	10	100.0					

MUSSELS (*M. galloprovincialis*)

SAMPLE ID	CONC (%)	REP.	# NORMAL	# ABNORMAL	NORM DEVEL (%)	MEAN NORM DEV (%)	STD DEV	% of CONTROL[2]	P-VALUE[b]	SIG DIFF FROM CONTROL?
NAV-BAY14-SDB4-DUR	100	a	2	160	1.2	8.2	7.5	8.4	0.000	Yes
		b	12	158	7.1					
		c	33	140	19.1					
		d	20	148	11.9					
		e	3	171	1.7					
ALL-BAY-SDB4-PRE	100	a	183	3	98.4	97.5	0.9	100.0	-	-
		b	165	3	98.2					
		c	179	4	97.8					
		d	175	7	96.2					
		e	192	6	97.0					

All – Sample collected at SSC-SD

QA/QC SAMPLES[a]

TOPSMELT (*A. affinis*)

SAMPLE ID	CONC (% or µg/l Cu)	REP	SURVIVAL (#)	SURVIVAL (%)	MEAN SURVIVAL (%)	STD DEV	% of CONTROL[2]	P-VALUE[b]	SIG DIFF FROM CONTROL?
Scripps Control	n/a	a	5	100.0	100.0	0.0	100.0	n/a	n/a
		b	5	100.0					
		c	5	100.0					
		d	5	100.0					
Salt Control	n/a	a	5	100.0	100.0	0.0	100.0	n/a	No
		b	5	100.0					
		c	5	100.0					
		d	5	100.0					
Copper Ref. Tox.	50	a	5	100.0	100.0	0.0	100.0	n/a	No
		b	5	100.0					
		c	5	100.0					
		d	5	100.0					
	100	a	4	80.0	90.0	11.5	90.0	0.196	No
		b	5	100.0					
		c	5	100.0					
		d	4	80.0					
	200	a	0	0.0	0.0	0.0	0.0	0.000	Yes
		b	0	0.0					
		c	0	0.0					
		d	0	0.0					
	400	a	0	0.0	0.0	0.0	0.0	0.000	Yes
		b	0	0.0					
		c	0	0.0					
		d	0	0.0					

MYSIDS (*A. bahia*)

SAMPLE ID	CONC (% or µg/l Cu)	REP	SURVIVAL (#)	SURVIVAL (%)	MEAN SURVIVAL (%)	STD DEV	% of CONTROL[2]	P-VALUE[b]	SIG DIFF FROM CONTROL?
Scripps Control	n/a	a	9	90.0	93.3	5.8	100.0	n/a	n/a
		b	9	90.0					
		c	10	100.0					
Salt Control	n/a	a	10	100.0	100.0	0.0	107.1	0.092	No
		b	10	100.0					
		c	10	100.0					
Copper Ref. Tox.	25	a	10	100.0	100.0	0.0	107.1	0.092	No
		b	10	100.0					
		c	10	100.0					
	50	a	10	100.0	100.0	0.0	107.1	0.092	No
		b	10	100.0					
		c	10	100.0					
	100	a	10	100.0	100.0	0.0	107.1	0.092	No
		b	10	100.0					
		c	10	100.0					
	200	a	9	90.0	83.3	5.8	89.3	0.051	No
		b	8	80.0					
		c	8	80.0					
	400	a	2	20.0	6.7	11.5	7.1	0.001	Yes
		b	0	0.0					
		c	0	0.0					

MUSSELS (*M. galloprovincialis*)

SAMPLE ID	CONC (% or µg/l Cu)	REP.	# NORMAL	# ABNORMAL	NORM DEVEL (%)	MEAN NORM DEV (%)	STD DEV	% of CONTROL[2]	P-VALUE[b]	SIG DIFF FROM CONTROL?
Scripps Control	n/a	a	148	25	85.5	94.5	5.4	100.0	n/a	No
		b	175	5	97.2					
		c	139	10	93.3					
		d	193	4	98.0					
		e	174	3	98.3					
Brine Control	n/a	a	177	6	96.7	95.7	1.1	98.1	0.011	Yes
		b	170	10	94.4					
		c	186	6	96.9					
		d	171	8	95.5					
		e	164	9	94.8					
Copper Ref. Tox.	2.9	a	167	9	94.9	95.1	0.7	100.7	0.374	No
		b	200	11	94.8					
		c	168	10	94.4					
		d	176	8	95.7					
		e	168	7	96.0					
	4.1	a	166	3	98.2	90.3	10.0	95.6	0.308	No
		b	202	7	96.7					
		c	164	17	90.6					
		d	118	43	73.3					
		e	141	11	92.8					
	5.9	a	178	9	95.2	79.0	14.3	83.7	0.182	Yes
		b	169	20	89.4					
		c	157	36	81.3					
		d	128	60	68.1					
		e	124	79	61.1					
	8.4	a	69	106	39.4	23.7	13.7	25.1	0.017	Yes
		b	56	141	28.4					
		c	58	126	31.5					
		d	12	177	6.3					
		e	24	162	12.9					
	12.0	a	1	177	0.6	1.3	1.3	1.3	0.000	Yes
		b	5	172	2.8					
		c	5	203	2.4					
		d	1	207	0.5					
		e	0	171	0.0					
	17.2	a	3	177	1.7	0.5	0.7	0.5	0.000	Yes
		b	1	167	0.6					
		c	0	191	0.0					
		d	0	175	0.0					
		e	0	199	0.0					

SUMMARY RESULTS- QA/QC

COPPER REFERENCE TOXICANT TEST

SPECIES	NOEC (µg/l)	LOEC (µg/l)	EC50 (µg/l)	95% C.L. (µg/l)
TOPSMELT	50	100	132.0	120.2-144.8
MYSIDS	200	400	265.3	232.5-302.4
MUSSELS	5.9	8.4	7.29	6.1-8.3

[a]Controls (QA/QC) correspond to all samples from SDB4

[b]Student's t-test with a one tailed distribution and two sample unequal variance

[c] p-value is significant because treatment had a significantly greater proportion normal compared to the control
n/a- t-test not used since control and treatment have same percentage survival

[1]Controls were the Bay water samples taken prior to storm (PRE) with comparable sample ID

[2]Controls were Scripps filtered seawater

WATER QUALITY

TOPSMELT (*A. affinis*)

SAMPLE ID	Effluent Concentration (% or µg/l Cu)	Rep	pH (SU)					Dissolved Oxygen (mg/l)					Temperature (°C)					Salinity (‰)				
			0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96
NAV-OF14-SDB4-FF	12.5%	a	7.9	7.8	7.6	7.6	7.6	6.6	5.6	5.2	5.3	5.5	20.2	18.3	19.6	19.2	19.4	33.7	34.1	34.4	34.4	34.5
	25%	a	7.9	7.7	7.7	7.7	7.8	6.7	6.6	6.2	6.8	7.0	19.9	18.0	19.6	19.4	19.3	33.6	34.0	34.3	34.3	34.3
	50%	a	8.0	7.7	7.7	7.8	7.8	6.6	6.7	6.2	6.5	6.5	19.4	18.3	19.4	18.9	19.3	33.2	33.5	34.3	34.3	34.6
	100%	a	8.2	7.7	7.3	7.7	7.8	6.8	6.6	3.0	6.6	7.0	18.2	18.1	19.5	19.0	18.7	32.4	32.7	33.9	33.9	34.4
NAV-BAY14-SDB4-DUR	100%	a	7.7	7.5	7.6	7.6	7.7	6.7	5.7	5.2	6.1	6.2	18.8	18.3	19.6	19.4	19.5	30.8	31.0	31.1	31.4	31.4
Scripps Control	0	a	7.8	7.8	7.7	7.8	7.7	6.9	5.9	5.5	6.0	6.0	19.1	18.3	19.7	19.0	19.5	33.8	34.0	34.0	34.3	34.3
Cu Ref. Tox.	50 µg/l	a	7.9	7.8	7.7	7.8	7.7	6.9	6.2	6.5	6.3	5.9	18.7	18.0	19.2	19.1	19.4	33.9	34.4	34.7	34.2	34.3
	100 µg/l	a	7.9	7.8	7.0	7.8	7.8	7.1	6.0	6.1	6.4	6.3	18.8	18.0	19.1	19.0	19.4	33.8	34.1	34.5	34.3	34.5
	200 µg/l	a	7.8	7.8	7.7	7.9	7.8	7.0	6.0	5.9	6.5	6.5	18.6	18.1	19.4	19.1	19.3	33.8	34.0	34.7	34.1	34.2
	400 µg/l	a	7.8	7.9	N	N	N	7.0	6.2	N	N	N	18.6	18.0	N	N	N	33.8	34.1	N	N	N
Salt Control	n/a	a	8.1	7.9	7.7	7.8	7.6	6.9	5.9	6.2	6.0	6.1	19.8	18.0	18.9	18.9	19.4	33.3	33.5	33.6	33.6	33.7

MYSIDS (*A. bahia*)

SAMPLE ID	Effluent Concentration (% or µg/l Cu)	Rep	pH (SU)					Dissolved Oxygen (mg/l)					Temperature (°C)					Salinity (‰)				
			0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96
NAV-OF14-SDB4-FF	12.5%	a	7.9	7.6	7.6	7.6	7.5	6.7	4.7	4.5	4.0	4.4	19.7	18.6	19.6	19.4	19.6	34.2	34.5	34.5	34.4	34.4
	25%	a	7.9	7.7	7.8	7.7	7.9	6.7	6.7	6.5	6.2	7.1	19.5	18.6	19.4	19.3	19.3	34.0	34.3	34.3	34.3	34.6
	50%	a	8.0	7.7	7.8	7.8	7.8	6.6	6.6	6.5	6.5	6.4	19.3	18.3	19.4	19.2	19.4	33.7	34.1	34.2	34.3	34.7
	100%	a	8.2	7.7	7.8	7.7	7.9	6.7	6.8	6.4	6.0	6.6	18.5	17.7	19.1	19.1	19.3	32.9	33.3	33.4	33.8	34.2
NAV-BAY14-SDB4-DUR	100%	a	7.7	7.5	7.5	7.6	7.7	6.8	4.7	4.8	5.4	5.3	18.6	18.3	19.6	19.6	19.6	31.2	31.5	31.4	31.7	31.8
Scripps Control	0	a	7.9	7.7	7.7	7.7	7.6	6.9	4.7	5.3	5.0	4.8	18.8	18.3	19.4	19.3	19.5	34.4	34.6	34.6	34.2	34.3
Cu Ref. Tox.	25 µg/l	a	7.9	7.7	7.7	7.8	7.6	6.9	5.4	5.7	5.4	5.2	18.8	18.6	19.4	19.3	19.6	34.3	34.4	34.6	34.3	34.3
	50 µg/l	a	7.9	7.7	7.6	7.7	7.6	7.1	5.3	5.3	5.0	4.5	18.7	18.6	19.5	19.3	19.6	34.4	34.5	34.5	34.2	34.2
	100 µg/l	a	7.9	7.7	7.6	7.7	7.7	7.1	5.7	4.9	5.6	5.1	18.6	18.5	19.4	19.3	19.6	34.2	34.4	34.5	34.3	34.3
	200 µg/l	a	7.9	7.8	7.8	7.8	7.7	7.0	5.9	6.3	6.1	5.7	18.7	18.6	19.1	19.3	19.6	34.4	34.6	34.2	34.3	34.4
	400 µg/l	a	7.9	7.8	7.6	7.9	7.8	7.0	6.1	5.5	6.4	6.1	18.7	18.6	19.4	19.3	19.6	34.3	34.5	34.6	34.2	34.2
Salt Control	n/a	a	7.9	7.8	7.6	7.9	7.8	7.0	6.1	5.5	6.4	6.1	18.7	18.6	19.4	19.3	19.6	34.3	34.5	34.6	34.2	34.2

MUSSELS (*M. galloprovincialis*)

SAMPLE ID	Effluent Concentration (% or µg/l Cu)	Rep.	pH (SU)		D.O. (mg/l)		Temp (°C)		Salinity (‰)	
			0	48	0	48	0	48	0	48
NAV-OF14-SDB4-FF	6.25%	f	7.7	7.6	7.0	6.6	15.7	15.7	33.6	33.8
	25%	f	7.7	7.6	7.0	5.8	15.5	15.7	34.0	33.9
	62.7%	f	7.7	7.3	6.9	3.3	15.6	15.7	33.6	34.0
NAV-BAY14-SDB4-DUR	100%	f	7.7	7.8	7.0	6.8	15.1	15.3	34.0	34.2
Scripps Control	0	f	7.8	7.6	6.9	6.8	15.6	15.7	34.0	34.2
Cu Ref. Tox.	2.9 µg/l	f	7.8	7.8	7.0	6.8	15.8	15.7	33.9	34.1
	8.4 µg/l	f	7.8	7.7	6.9	6.8	15.7	15.5	33.9	34.1
	24 µg/l	f	7.8	7.8	6.9	7.1	15.8	15.5	34.1	34.1
Brine Control	0	f	7.9	7.9	7.0	7.0	15.5	15.7	33.7	34.2

N - water quality not taken due to 100% mortality in treatment

SDB45 – 10/26/2004

OUTFALLS

TOPSMELT (*A. affinis*)

SAMPLE ID	CONC (%)	REP	SURVIVAL (#)	SURVIVAL (%)	MEAN SURVIVAL (%)	STD DEV	% of CONTROL[1]	P-VALUE[b]	SIG DIFF FROM CONTROL?
NAV-OF14-SDB45-FF	12.5	a	5	100	95.0	10.0	95.0	0.196	No
		b	4	80					
		c	5	100					
		d	5	100					
	25	a	5	100	100.0	0.0	100.0	n/a	No
		b	5	100					
		c	5	100					
		d	5	100					
	50	a	5	100	100.0	0.0	100.0	n/a	No
		b	5	100					
		c	5	100					
		d	5	100					
	100	a	4	80	90.0	11.5	90.0	0.091	No
		b	5	100					
		c	5	100					
		d	4	80					

MYSIDS (*A. bahia*)

SAMPLE ID	CONC (%)	REP	SURVIVAL (#)	SURVIVAL (%)	MEAN SURVIVAL (%)	STD DEV	% of CONTROL[1]	P-VALUE[b]	SIG DIFF FROM CONTROL?
NAV-OF14-SDB45-FF	12.5	a	9	90	96.7	5.8	96.7	0.211	No
		b	10	100					
		c	10	100					
	25	a	10	100	100.0	0.0	100.0	n/a	No
		b	10	100					
		c	10	100					
	50	a	10	100	100.0	0.0	100.0	n/a	No
		b	10	100					
		c	10	100					
	100	a	7	70	63.3	5.8	63.3	0.004	Yes
		b	6	60					
		c	6	60					
NAV-OF14-SDB45-COMP	100	a	7	70	80.0	10.0	80.0	0.037	Yes
		b	9	90					
		c	8	80					

MUSSELS (*M. galloprovincialis*)

SAMPLE ID	CONC (%)	REP.	# NORMAL	# ABNORMAL	NORM DEVEL (%)	MEAN NORM DEV (%)	STD DEV	% of CONTROL[1]	P-VALUE[b]	SIG DIFF FROM CONTROL?
NAV-OF14-SDB45-FF	6.25	a	172	13	93.0	93.9	3.0	101.4	0.244	No
		b	172	16	91.5					
		c	158	14	91.9					
		d	181	11	94.3					
		e	186	2	98.9					
	12.5	a	185	10	94.9	96.2	1.1	103.9	0.020	Yes[c]
		b	184	4	97.9					
		c	155	6	96.3					
		d	149	7	95.5					
		e	193	7	96.5					
	25	a	158	11	93.5	94.4	1.5	102.0	0.122	No
		b	169	9	94.9					
		c	159	12	93.0					
		d	180	12	93.8					
		e	181	6	96.8					
	50	a	135	25	84.4	40.4	27.2	43.7	0.006	Yes
		b	25	133	15.8					
		c	61	114	34.9					
		d	39	144	21.3					
		e	71	84	45.8					
	61.4	a	5	142	3.4	1.2	1.4	1.2	0.000	Yes
		b	2	170	1.2					
		c	2	165	1.2					
		d	0	147	0.0					
		e	0	167	0.0					

MUSSELS (*M. galloprovincialis*)

SAMPLE ID	CONC (%)	REP.	# NORMAL	# ABNORMAL	NORM DEVEL (%)	MEAN NORM DEV (%)	STD DEV	% of CONTROL[1]	P-VALUE[b]	SIG DIFF FROM CONTROL?
NAV-OF14-SDB45-COMP	6.25	a	200	10	95.2	94.0	2.1	101.6	0.186	No
		b	173	9	95.1					
		c	202	8	96.2					
		d	158	13	92.4					
		e	158	15	91.3					
	12.5	a	187	11	94.4	95.6	1.5	103.2	0.039	Yes[c]
		b	169	11	93.9					
		c	183	4	97.9					
		d	186	8	95.9					
		e	182	8	95.8					
	25	a	170	5	97.1	94.3	2.1	101.9	0.144	No
		b	152	9	94.4					
		c	157	14	91.8					
		d	169	8	95.5					
		e	170	13	92.9					
	50	a	162	7	95.9	93.6	2.7	101.1	0.285	No
		b	145	7	95.4					
		c	147	17	89.6					
		d	151	8	95.0					
		e	163	14	92.1					
	61.4	a	122	21	85.3	86.4	1.1	93.3	0.003	Yes
		b	132	21	86.3					
		c	137	21	86.7					
		d	147	20	88.0					
		e	113	19	85.6					

[a]Controls (QA/QC) correspond to all samples from SDB45

[b]Student's t-test with a one tailed distribution and two sample unequal variance

[c] p-value is significant because treatment had a significantly greater proportion normal compared to the control

n/a - t-test not used since control and treatment have same percentage survival

[1]Controls were the Bay water samples taken prior to storm (PRE) with comparable sample ID

[2]Controls were Scripps filtered seawater

BAY SAMPLES

TOPSMELT (*A. affinis*)

SAMPLE ID	CONC (%)	REP	SURVIVAL (#)	SURVIVAL (%)	MEAN SURVIVAL (%)	STD DEV	% of CONTROL[2]	P-VALUE[b]	SIG DIFF FROM CONTROL?
NAV-BAY14-SDB45-PRE	100	a	5	100	100.0	0.0	100.0	n/a	No
		b	5	100					
		c	5	100					
		d	5	100					

MYSIDS (*A. bahia*)

SAMPLE ID	CONC (%)	REP	SURVIVAL (#)	SURVIVAL (%)	MEAN SURVIVAL (%)	STD DEV	% of CONTROL[2]	P-VALUE[b]	SIG DIFF FROM CONTROL?
NAV-BAY14-SDB45-PRE	100	a	10	100	100.0	0.0	100.0	n/a	No
		b	10	100					
		c	10	100					

MUSSELS (*M. galloprovincialis*)

SAMPLE ID	CONC (%)	REP.	# NORMAL	# ABNORMAL	NORM DEVEL (%)	MEAN NORM DEV (%)	STD DEV	% of CONTROL[2]	P-VALUE[b]	SIG DIFF FROM CONTROL?
NAV-BAY14-SDB45-PRE	100.0	a	206	12	94.5	92.6	2.8	100.0	n/a	n/a
		b	149	16	90.3					
		c	168	13	92.8					
		d	142	17	89.3					
		e	165	7	95.9					

QA/QC SAMPLES[a]

TOPSMELT (*A. affinis*)

SAMPLE ID	CONC (% or µg/l Cu)	REP	SURVIVAL (#)	SURVIVAL (%)	MEAN SURVIVAL (%)	STD DEV	% of CONTROL[2]	P-VALUE[b]	SIG DIFF FROM CONTROL?
Scripps Control	n/a	a	5	100.0	100.0	0.0	100.0	n/a	n/a
		b	5	100.0					
		c	5	100.0					
		d	5	100.0					
Salt Control	n/a	a	5	100.0	100.0	0.0	100.0	n/a	No
		b	5	100.0					
		c	5	100.0					
		d	5	100.0					
Copper Ref. Tox.	50	a	5	100	90.0	11.5	90.0	0.091	No
		b	4	80					
		c	5	100					
		d	4	80					
	100	a	4	80	60.0	16.3	60.0	0.008	Yes
		b	2	40					
		c	3	60					
		d	3	60					
	200	a	0	0	0.0	0.0	0.0	0.000	Yes
		b	0	0					
		c	0	0					
		d	0	0					
	400	a	0	0	0.0	0.0	0.0	0.000	Yes
		b	0	0					
		c	0	0					
		d	0	0					

MYSIDS (*A. bahia*)

SAMPLE ID	CONC (% or µg/l Cu)	REP	SURVIVAL (#)	SURVIVAL (%)	MEAN SURVIVAL (%)	STD DEV	% of CONTROL	P-VALUE[b]	SIG DIFF FROM CONTROL?
Scripps Control	n/a	a	10	100.0	100.0	0.0	100.0	n/a	n/a
		b	10	100.0					
		c	10	100.0					
Salt Control	n/a	a	9	90.0	80.0	26.5	80.0	0.160	No
		b	10	100.0					
		c	5	50.0					
Copper Ref. Tox.	25	a	10	100	100.0	0.0	100.0	n/a	No
		b	10	100					
		c	10	100					
	50	a	10	100	96.7	5.8	96.7	0.211	No
		b	10	100					
		c	9	90					
	100	a	10	100	96.7	5.8	96.7	0.211	No
		b	10	100					
		c	9	90					
	200	a	9	90	83.3	11.5	83.3	0.065	No
		b	7	70					
		c	9	90					
	400	a	1	10	6.7	5.8	6.7	0.001	Yes
		b	1	10					
		c	0	0					

MUSSELS (*M. galloprovincialis*)

SAMPLE ID	CONC (% or µg/l Cu)	REP.	# NORMAL	# ABNORMAL	NORM DEVEL (%)	MEAN NORM DEV (%)	STD DEV	% of CONTROL[2]	P-VALUE[b]	SIG DIFF FROM CONTROL?
Scripps Control	n/a	a	148	25	85.5	94.5	5.4	100.0	n/a	No
		b	175	5	97.2					
		c	139	10	93.3					
		d	193	4	98.0					
		e	174	3	98.3					
Brine Control	n/a	a	177	6	96.7	95.7	1.1	98.1	0.011	Yes
		b	170	10	94.4					
		c	186	6	96.9					
		d	171	8	95.5					
		e	164	9	94.8					
Copper Ref. Tox.	2.9	a	167	9	94.9	95.1	0.7	100.7	0.374	No
		b	200	11	94.8					
		c	168	10	94.4					
		d	176	8	95.7					
		e	168	7	96.0					
	4.1	a	166	3	98.2	90.3	10.0	95.6	0.308	No
		b	202	7	96.7					
		c	164	17	90.6					
		d	118	43	73.3					
		e	141	11	92.8					
	5.9	a	178	9	95.2	79.0	14.3	83.7	0.182	Yes
		b	169	20	89.4					
		c	157	36	81.3					
		d	128	60	68.1					
		e	124	79	61.1					
	8.4	a	69	106	39.4	23.7	13.7	25.1	0.017	Yes
		b	56	141	28.4					
		c	58	126	31.5					
		d	12	177	6.3					
		e	24	162	12.9					
	12.0	a	1	177	0.6	1.3	1.3	1.3	0.000	Yes
		b	5	172	2.8					
		c	5	203	2.4					
		d	1	207	0.5					
		e	0	171	0.0					
	17.2	a	3	177	1.7	0.5	0.7	0.5	0.000	Yes
		b	1	167	0.6					
		c	0	191	0.0					
		d	0	175	0.0					
		e	0	199	0.0					

SUMMARY RESULTS- QA/QC

COPPER REFERENCE TOXICANT TEST

SPECIES	NOEC (µg/l)	LOEC (µg/l)	EC50 (µg/l)	95% C.L. (µg/l)
TOPSMELT	50	100.0	97.7	80.6-118.1
MYSIDS	100	200.0	287.0	237.0-314.4
MUSSELS[d]	5.9	8.4	7.3	6.1-8.3

[a]Controls (QA/QC) correspond to all samples from SDB45

[b]Student's t-test with a one tailed distribution and two sample unequal variance

[c] p-value is significant because treatment had a significantly greater proportion normal compared to the control

[d] Copper reference toxicant test performed on 10/17/2004

n/a - t-test not used since control and treatment have same percentage survival

[1]Controls were the Bay water samples taken prior to storm (PRE) with comparable sample ID

[2]Controls were Scripps filtered seawater

WATER QUALITY

TOPSMELT (*A. affinis*)

SAMPLE ID	Effluent Concentration (% or µg/l Cu)	Rep	pH (SU)					Dissolved Oxygen (mg/l)					Temperature (°C)					Salinity (‰)				
			0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96
NAV-OF14-SDB45-FF	12.5%	a	8.0	7.8	7.7	7.7	7.7	6.6	7.0	6.4	6.3	5.9	18.4	18.9	19.1	19.0	19.1	33.8	33.9	34.3	34.3	34.6
	25%	a	8.2	7.9	7.7	7.6	7.7	6.8	7.1	6.4	6.2	6.0	18.3	18.0	19.1	18.9	19.1	33.8	34.0	34.4	34.3	34.6
	50%	a	8.5	8.1	7.8	7.8	7.7	6.7	6.5	6.5	5.8	5.5	18.3	18.9	19.1	19.0	19.1	33.8	34.0	34.2	34.3	34.4
	100%	a	8.8	8.3	8.1	8.1	7.9	6.6	5.6	5.6	4.5	4.5	18.4	19.0	19.3	19.3	19.3	34.0	34.0	34.1	34.5	34.5
NAV-BAY14-SDB45-PRE	100%	a	7.8	7.7	7.7	7.6	7.6	6.8	6.9	6.6	6.0	5.7	18.4	19.1	18.8	19.1	19.2	33.7	33.9	34.2	34.1	34.0
Scripps Cu Ref. Tox.	50 µg/l	a	7.9	7.8	7.7	7.7	7.6	6.4	7.1	6.8	6.6	6.0	18.3	19.3	18.9	19.2	19.1	33.9	34.0	34.4	34.1	34.0
	100 µg/l	a	7.9	7.7	7.7	7.7	7.7	6.6	7.0	6.6	6.7	6.3	18.3	19.1	18.9	19.0	19.4	33.9	34.0	34.4	34.3	34.7
	200 µg/l	a	7.9	7.7	7.7	N	N	6.6	7.0	6.9	N	N	18.3	19.2	19.0	N	N	33.9	33.9	34.1	N	N
	400 µg/l	a	7.8	7.8	7.7	N	N	6.7	7.0	7.1	N	N	18.3	19.1	19.1	N	N	33.9	34.0	34.5	N	N
Salt Control	n/a	a	8.0	7.6	7.6	7.8	7.7	6.2	7.0	6.8	6.3	6.2	19.0	19.1	18.6	18.9	19.0	33.3	33.6	34.1	33.9	34.3

MYSIDS (*A. bahia*)

SAMPLE ID	Effluent Concentration (% or µg/l Cu)	Rep	pH (SU)					Dissolved Oxygen (mg/l)					Temperature (°C)					Salinity (‰)				
			0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96
NAV-OF14-SDB45-FF	12.5%	a	8.0	8.0	7.7	7.6	7.6	6.9	6.1	5.5	4.4	4.4	18.6	19.3	18.8	19.1	19.3	33.6	33.8	34.2	34.0	34.1
	25%	a	8.2	8.0	7.7	7.9	7.7	6.8	6.6	5.2	6.3	5.8	18.6	19.3	19.0	19.2	18.8	33.8	33.7	34.0	34.1	34.4
	50%	a	8.6	8.2	8.0	7.8	7.8	7.0	5.3	4.5	2.5	7.1	18.6	19.4	19.0	19.2	18.9	33.7	33.8	33.9	34.1	34.4
	100%	a	9.1	8.6	8.3	8.3	ND	7.0	5.0	4.7	4.0	6.7	18.6	19.4	19.0	19.1	19.1	33.9	33.9	34.1	34.5	34.7
NAV-OF14-SDB45-COMP	100%	a	ND	8.6	8.3	8.5	8.3	ND	6.1	5.1	5.2	4.6	ND	19.3	18.9	19.1	19.3	ND	32.6	32.7	34.4	34.5
NAV-BAY14-SDB45-PRE	100%	a	7.8	7.7	7.5	7.4	7.9	6.8	6.2	5.6	3.7	7.0	18.8	19.4	19.0	19.1	19.0	33.6	33.6	33.8	33.9	34.4
Scripps Control	0	a	7.9	7.7	7.6	7.5	7.8	6.7	6.4	5.3	5.2	5.7	19.0	19.3	18.9	19.1	18.9	33.8	33.9	34.0	34.1	34.4
Scripps Cu Ref. Tox.	25 µg/l	a	7.9	7.8	7.6	7.6	7.7	6.8	7.2	6.7	5.9	5.2	18.5	19.4	19.0	19.1	19.5	33.9	33.9	34.2	33.8	34.0
	50 µg/l	a	7.9	7.7	7.6	7.6	7.5	6.6	6.8	6.4	4.5	4.0	18.8	19.4	19.0	19.1	19.5	33.9	33.9	34.0	34.0	34.1
	100 µg/l	a	7.9	7.7	7.6	7.6	7.6	6.7	6.3	6.4	5.2	4.9	18.8	19.3	19.0	19.1	19.4	33.9	33.9	34.2	34.0	34.1
	200 µg/l	a	7.9	7.7	7.6	7.7	7.7	6.7	6.7	6.7	6.1	5.4	18.8	19.3	18.9	19.1	19.4	33.9	34.0	34.2	34.1	34.2
	400 µg/l	a	7.9	7.8	7.6	7.7	7.7	6.6	6.8	7.1	6.5	6.0	18.6	19.3	19.0	19.3	19.6	33.9	34.0	34.1	34.0	34.2
Salt Control	n/a	a	8.0	7.9	7.7	7.9	7.7	6.0	6.6	5.5	5.2	5.5	19.4	19.4	19.0	19.1	18.8	33.2	33.2	33.4	33.6	34.1

MUSSELS (*M. galloprovincialis*)

SAMPLE ID	Effluent Concentration (% or µg/l Cu)	Rep.	pH (SU)			D.O. (mg/l)			Temperature (°C)			Salinity (‰)		
			0	24	48	0	24	48	0	24	48	0	24	48
NAV-OF14-SDB45-FF	6.25%	f	7.8	7.8	7.8	6.8	7.6	7.6	17.1	17.2	16.5	33.7	33.7	33.6
	12.5%	f	7.8	7.8	7.8	7.1	7.9	7.6	17.2	17.5	16.5	33.6	33.4	33.5
	25%	f	7.8	7.9	7.7	7.1	6.9	7.5	16.7	17.0	16.4	33.9	33.8	34.0
	50.00%	f	7.9	7.8	7.7	7.0	6.6	7.7	17.2	17.5	16.4	34.0	34.1	34.4
	61.4%	f	8.0	7.9	7.7	7.1	6.6	7.2	16.9	17.2	16.5	33.9	33.7	34.0
NAV-OF14-SDB45-COMP	6%	f	7.8	7.8	7.8	7.0	7.2	7.7	17.1	17.7	16.4	33.6	33.5	33.5
	12.50%	f	7.8	7.8	7.8	7.0	6.7	6.7	17.7	18.0	16.5	33.6	33.7	34.0
	25.0%	f	7.8	7.8	7.8	7.2	6.4	6.4	17.1	17.1	16.5	33.6	33.6	33.7
	50%	f	7.9	7.8	7.8	7.1	7.0	7.5	17.3	17.7	16.6	33.7	33.8	34.0
	61.4%	f	7.9	7.8	7.8	7.4	7.5	7.5	17.5	17.3	16.6	33.9	33.7	33.9
NAV-BAY14-SDB45-PRE	100%	f	7.9	7.8	7.8	6.9	6.9	7.6	ND	18.3	16.3	ND	33.7	33.9
Scripps Control	0	f	7.8	ND	7.6	6.9	ND	6.8	15.6	ND	15.7	34.0	ND	34.2
Cu Ref. Tox.	2.9 µg/l	f	7.8	ND	7.8	7.0	ND	6.8	15.8	ND	15.7	33.9	ND	34.1
	8.4 µg/l	f	7.8	ND	7.7	6.9	ND	6.8	15.7	ND	15.5	33.9	ND	34.1
	24 µg/l	f	7.8	ND	7.8	6.9	ND	7.1	15.8	ND	15.5	34.1	ND	34.1
Brine Control	0	f	7.9	ND	7.9	7.0	ND	7.0	15.5	ND	15.7	33.7	ND	34.2

N - water quality not taken due to 100% mortality in treatment
ND - water quality not recorded

SDB5 – 01/10/2005

BAY SAMPLES

TOPSMELT (*A. affinis*)

SAMPLE ID	CONC (%)	REP	SURVIVAL (#)	SURVIVAL (%)	MEAN SURVIVAL (%)	STD DEV	% of CONTROL[2]	P-VALUE[b]	SIG DIFF FROM CONTROL?
NAV-BAY14-SDB	100	a	5	100.0	100	0.0	100	n/a	No
		b	5	100.0					
		c	5	100.0					
		d	5	100.0					

MYSIDS (*A. bahia*)

SAMPLE ID	CONC (%)	REP	SURVIVAL (#)	SURVIVAL (%)	MEAN SURVIVAL (%)	STD DEV	% of CONTROL[2]	P-VALUE[b]	SIG DIFF FROM CONTROL?
NAV-BAY14-SDB5-AFT	100	a	10	100.0	100.0	0.0	107.1	0.092	No
		b	10	100.0					
		c	10	100.0					

MUSSELS (*M. galloprovincialis*)

SAMPLE ID	CONC (%)	REP.	# NORMAL	# ABNORMAL	NORM DEVEL (%)	MEAN NORM DEV (%)	STD DEV	% of CONTROL[2]	P-VALUE[b]	SIG DIFF FROM CONTROL?
NAV-BAY14-SDB5-AFT	100	a	162	8	95.3	94.9	2.0	105.3	0.004	Yes[c]
		b	156	14	91.8					
		c	149	6	96.1					
		d	166	10	94.3					
		e	168	5	97.1					

QA/QC SAMPLES[a]

TOPSMELT (*A. affinis*)

SAMPLE ID	(% or µg/l Cu)	REP	SURVIVAL (#)	SURVIVAL (%)	MEAN SURVIVAL (%)	STD DEV	% of CONTROL[2]	P-VALUE[b]	SIG DIFF FROM CONTROL?
Scripps Control	n/a	a	5	100	100.0	0.0	100.0	n/a	n/a
		b	5	100					
		c	5	100					
		d	5	100					
Copper Ref. Tox.	25	a	5	100.0	100	0.0	100	n/a	No
		b	5	100.0					
		c	5	100.0					
		d	5	100.0					
	50	a	4	80.0	95	10.0	95	0.196	No
		b	5	100.0					
		c	5	100.0					
		d	5	100.0					
	100	a	4	80.0	90	11.5	90	0.091	No
		b	5	100.0					
		c	5	100.0					
		d	4	80.0					
	200	a	1	20.0	15	10.0	15	0.000	Yes
		b	1	20.0					
		c	1	20.0					
		d	0	0.0					
	400	a	0	0.0	0	0.0	0	0.000	Yes
		b	0	0.0					
		c	0	0.0					
		d	0	0.0					

MYSIDS (*A. bahia*)

SAMPLE ID	CONC (% or µg/l Cu)	REP	SURVIVAL (#)	SURVIVAL (%)	MEAN SURVIVAL (%)	STD DEV	% of CONTROL[2]	P-VALUE[b]	SIG DIFF FROM CONTROL?
Scripps Control	n/a	a	9	90.0	93.3	5.8	100.0	n/a	n/a
		b	9	90.0					
		c	10	100.0					
Copper Ref. Tox.	50	a	10	100.0	100.0	0.0	107.1	0.092	No
		b	10	100.0					
		c	11	100.0					
	100	a	10	100.0	100.0	0.0	107.1	0.092	No
		b	10	100.0					
		c	10	100.0					
	200	a	8	80.0	90.0	10.0	96.4	0.325	No
		b	9	90.0					
		c	10	100.0					
	400	a	2	20.0	26.7	11.5	28.6	0.002	Yes
		b	2	20.0					
		c	4	40.0					

MUSSELS (*M. galloprovincialis*)

SAMPLE ID	CONC (% or µg/l Cu)	REP.	# NORMAL	ABNORMA	NORM DEVEL (%)	MEAN NORM DEV (%)	STD DEV	% of CONTROL[2]	P-VALUE[b]	SIG DIFF FROM CONTROL?
Scripps Control	n/a	a	160	4	97.6	97.7	1.0	100.0	n/a	No
		b	222	4	98.2					
		c	236	6	97.5					
		d	233	9	96.3					
		e	257	3	98.8					
Brine Control 1	n/a	a	204	3	98.6	98.4	0.8	100.7	0.119	No
		b	211	5	97.7					
		c	201	5	97.6					
		d	226	1	99.6					
		e	221	3	98.7					
Brine Control 2	n/a	a	189	3	98.4	97.8	1.1	100.1	0.440	No
		b	231	10	95.9					
		c	210	4	98.1					
		d	190	4	97.9					
		e	210	3	98.6					
Copper Ref. Tox.	2.9	a	231	5	97.9	98.6	0.7	101.0	0.057	No
		b	207	4	98.1					
		c	214	1	99.5					
		d	201	3	98.5					
		e	228	2	99.1					
	4.1	a	214	8	96.4	56.4	39.6	57.7	0.040	Yes
		b	205	21	90.7					
		c	-	-	-					
		d	-	-	-					
		e	-	-	-					
	5.9	a	125	101	55.3	49.3	10.8	50.5	0.000	Yes
		b	125	94	57.1					
		c	132	106	55.5					
		d	114	125	47.7					
		e	64	142	31.1					
	8.4	a	23	187	11.0	10.1	5.2	10.3	0.000	Yes
		b	24	173	12.2					
		c	4	210	1.9					
		d	32	170	15.8					
		e	21	200	9.5					
	12.0	a	0	195	0.0	0.3	0.2	0.3	0.000	Yes
		b	1	246	0.4					
		c	1	221	0.5					
		d	1	218	0.5					
		e	0	219	0.0					
	17.2	a	0	210	0.0	0.0	0.0	0.0	0.000	Yes
		b	0	187	0.0					
		c	0	178	0.0					
		d	0	215	0.0					
		e	0	198	0.0					

SUMMARY RESULTS- QA/QC

COPPER REFERENCE TOXICANT TEST

SPECIES	NOEC (µg/l)	LOEC (µg/l)	EC50 (µg/l)	95% C.L. (µg/l)
TOPSMELT	100	200	138.54	114.4-167.8
MYSIDS	200	400	324.9	276.2-379.8
MUSSELS[d]	4.1	5.9	6.0	5.9-6.1

Dash indicates no data (replicate was spilled or organisms not added)

[a]Controls (QA/QC) correspond to all samples from SDB5

[b]Student's t-test with a one tailed distribution and two sample unequal variance

[c] p-value is significant because treatment had a significantly greater proportion normal compared to the control

[d] Copper reference toxicant test performed on 02/10/2005

n/a - t-test not used since control and treatment have same percentage survival

[1]Controls were the Bay water samples taken prior to storm (PRE) with comparable sample ID

[2]Controls were Scripps filtered seawater

Appendix C2

SUB

SDB2- 2/24/2003
SDB2A- 12/11/2003
SDB3- 10/17/2004
TIE1- 2/18/2004
TIE1A- 2/26/2004
SDB4- 10/26/2004
SDB5- 01/10/2005

SDB2 – 02/24/2003

OUTFALLS

TOPSMELT (*A. affinis*)

SAMPLE ID	CONC (%)	REP	SURVIVAL (#)	SURVIVAL (%)	MEAN SURVIVAL (%)	STD DEV	% of CONTROL[1]	P-VALUE[b]	SIG DIFF FROM CONTROL?
SUB-OF11B-SDB2-FF	10	a	5	100.0	100.0	0.0	111.1	0.091	No
		b	5	100.0					
		c	5	100.0					
		d	5	100.0					
	50	a	4	80.0	90.0	11.5	100.0	0.500	No
		b	4	80.0					
		c	5	100.0					
		d	5	100.0					
	100	a	3	60.0	85.0	19.1	94.4	0.337	No
		b	5	100.0					
		c	4	80.0					
		d	5	100.0					
SUB-OF24-SDB2-FF	10	a	4	80.0	90.0	11.5	100.0	0.500	No
		b	4	80.0					
		c	5	100.0					
		d	5	100.0					
	50	a	5	100.0	90.0	11.5	100.0	0.500	No
		b	4	80.0					
		c	4	80.0					
		d	5	100.0					
	100	a	4	80.0	80.0	0.0	88.9	0.091	No
		b	4	80.0					
		c	4	80.0					
		d	4	80.0					
SUB-OF26-SDB2-FF	25	a	5	100.0	85.0	19.1	94.4	0.337	No
		b	3	60.0					
		c	5	100.0					
		d	4	80.0					
	50	a	4	80.0	90.0	11.5	100.0	0.500	No
		b	5	100.0					
		c	4	80.0					
		d	5	100.0					
	100	a	4	80.0	90.0	11.5	100.0	0.500	No
		b	4	80.0					
		c	5	100.0					
		d	5	100.0					

MYSIDS (*A. bahia*)

SAMPLE ID	CONC (%)	REP	SURVIVAL (#)	SURVIVAL (%)	MEAN SURVIVAL (%)	STD DEV	% of CONTROL[1]	P-VALUE[b]	SIG DIFF FROM CONTROL?
SUB-OF11B-SDB2-FF	10	a	10	100.0	100.0	0.0	100.0	n/a	No
		b	10	100.0					
		c	10	100.0					
	50	a	10	100.0	96.7	5.8	96.7	0.211	No
		b	10	100.0					
		c	9	90.0					
	100	a	7	70.0	86.7	15.3	86.7	0.135	No
		b	10	100.0					
		c	9	90.0					

MYSIDS (*A. bahia*)

SAMPLE ID	CONC (%)	REP	SURVIVAL (#)	SURVIVAL (%)	MEAN SURVIVAL (%)	STD DEV	% of CONTROL[1]	P-VALUE[b]	SIG DIFF FROM CONTROL?
SUB-OF24-SDB2-FF	10	a	10	100.0	100.0	0.0	100.0	n/a	No
		b	10	100.0					
		c	10	100.0					
	50	a	10	100.0	100.0	0.0	100.0	n/a	No
		b	10	100.0					
		c	10	100.0					
	100	a	10	100.0	100.0	0.0	100.0	n/a	No
		b	10	100.0					
		c	10	100.0					
SUB-OF26-SDB2-FF	10	a	10	100.0	100.0	0.0	100.0	n/a	No
		b	10	100.0					
		c	10	100.0					
	50	a	10	100.0	100.0	0.0	100.0	n/a	No
		b	10	100.0					
		c	10	100.0					
	100	a	10	100.0	100.0	0.0	100.0	n/a	No
		b	10	100.0					
		c	10	100.0					

MUSSELS (*M. galloprovincialis*)

SAMPLE ID	CONC (%)	REP.	# NORMAL	# ABNORMAL	NORM DEVEL (%)	MEAN NORM DEV (%)	STD DEV	% of CONTROL[1]	P-VALUE[b]	SIG DIFF FROM CONTROL?
SUB-OF11B-SDB2-FF	10.00	a	93	7	93.0	96.2	2.6	111.9	0.015	Yes[c]
		b	97	3	97.0					
		c	96	4	96.0					
		d	100	0	100.0					
		e	95	5	95.0					
	50.0	a	93	7	93.0	94.2	1.9	109.5	0.030	Yes[c]
		b	95	5	95.0					
		c	92	8	92.0					
		d	97	3	97.0					
		e	94	6	94.0					
	58	a	0	100	0.0	0.0	0.0	0.0	0.000	Yes
		b	0	100	0.0					
		c	0	100	0.0					
		d	0	100	0.0					
		e	0	100	0.0					
SUB-OF24-SDB2-FF	10	a	93	7	93.0	95.6	2.3	111.2	0.018	Yes[c]
		b	94	6	94.0					
		c	98	2	98.0					
		d	95	5	95.0					
		e	98	2	98.0					
	50	a	84	16	84.0	63.4	15.1	73.7	0.012	Yes
		b	44	56	44.0					
		c	71	29	71.0					
		d	56	44	56.0					
		e	62	38	62.0					
	58	a	0	100	0.0	0.2	0.4	0.2	0.000	Yes
		b	0	100	0.0					
		c	0	100	0.0					
		d	1	99	1.0					
		e	0	100	0.0					

MUSSELS (*M. galloprovincialis*)

SAMPLE ID	CONC (%)	REP.	# NORMAL	# ABNORMAL	NORM DEVEL (%)	MEAN NORM DEV (%)	STD DEV	% of CONTROL[1]	P-VALUE[b]	SIG DIFF FROM CONTROL?
SUB-OF26-SDB2-FF	10	a	93	7	93.0	96.2	2.6	111.9	0.015	Yes[c]
		b	100	0	100.0					
		c	95	5	95.0					
		d	96	4	96.0					
		e	97	3	97.0					
	50	a	36	64	36.0	40.4	11.7	47.0	0.000	Yes
		b	38	62	38.0					
		c	35	65	35.0					
		d	32	68	32.0					
		e	61	39	61.0					
	58	a	0	100	0.0	0.0	0.0	0.0	0.000	Yes
		b	0	100	0.0					
		c	0	100	0.0					
		d	0	100	0.0					
		e	0	100	0.0					

[a]Controls (QA/QC) correspond to all samples from SDB2

[b]Student's t-test with a one tailed distribution and two sample unequal variance

[c] p-value is significant because treatment had a significantly greater proportion normal compared to the control
n/a - t-test not used since control and treatment have same percentage survival

[1]Controls were the Bay water samples taken prior to storm (PRE) with comparable sample ID

[2]Controls were Scripps filtered seawater

BAY SAMPLES

TOPSMELT (*A. affinis*)

SAMPLE ID	CONC (%)	REP	SURVIVAL (#)	SURVIVAL (%)	MEAN SURVIVAL (%)	STD DEV	% of CONTROL[2]	P-VALUE[b]	SIG DIFF FROM CONTROL?
SUB-BAY11B-SDB2-PRE	100	a	4	80.0	90.0	11.5	92.3	0.149	No
		b	5	100.0					
		c	4	80.0					
		d	5	100.0					
SUB-BAY11B-SDB2-AFT	100	a	5	100.0	100.0	0.0	102.6	0.196	No
		b	5	100.0					
		c	5	100.0					
		d	5	100.0					
NAV-BAY24-SDB2-AFT	100	a	5	100.0	100.0	0.0	102.6	0.196	No
		b	5	100.0					
		c	5	100.0					
		d	5	100.0					
NAV-BAY26-SDB2-AFT	100	a	4	80.0	95.0	10.0	97.4	0.338	No
		b	5	100.0					
		c	5	100.0					
		d	5	100.0					

MYSIDS (*A. bahia*)

SAMPLE ID	CONC (%)	REP	SURVIVAL (#)	SURVIVAL (%)	MEAN SURVIVAL (%)	STD DEV	% of CONTROL[2]	P-VALUE[b]	SIG DIFF FROM CONTROL?
SUB-BAY11B-SDB2-PRE	100	a	10	100.0	100.0	0.0	100.0	n/a	No
		b	10	100.0					
		c	10	100.0					
SUB-BAY11B-SDB2-AFT	100	a	10	100.0	96.7	5.8	96.7	0.211	No
		b	9	90.0					
		c	10	100.0					
SUB -BAY24-SDB2-AFT	100	a	10	100.0	100.0	0.0	100.0	n/a	No
		b	10	100.0					
		c	10	100.0					
SUB-BAY26-SDB2-AFT	100	a	10	100.0	100.0	0.0	100.0	n/a	No
		b	10	100.0					
		c	10	100.0					

MUSSELS (*M. galloprovincialis*)

SAMPLE ID	CONC (%)	REP.	# NORMAL	# ABNORMAL	NORM DEVEL (%)	MEAN NORM DEV (%)	STD DEV	% of CONTROL[2]	P-VALUE[b]	SIG DIFF FROM CONTROL?
SUB-BAY11B-SDB2-PRE	100	a	89	11	89.0	86.0	7.1	89.4	0.015	Yes
		b	83	17	83.0					
		c	93	7	93.0					
		d	75	25	75.0					
		e	90	10	90.0					
SUB-BAY11B-SDB2-AFT	100	a	94	6	94.0	86.8	7.3	90.2	0.021	Yes
		b	93	7	93.0					
		c	77	23	77.0					
		d	88	12	88.0					
		e	82	18	82.0					
SUB-BAY24-SDB2-AFT	100	a	78	22	78.0	87.8	9.7	91.3	0.064	No
		b	96	4	96.0					
		c	91	9	91.0					
		d	77	23	77.0					
		e	97	3	97.0					
SUB-BAY26-SDB2-AFT	100	a	88	12	88.0	91.0	4.2	94.6	0.035	Yes
		b	88	12	88.0					
		c	88	12	88.0					
		d	97	3	97.0					
		e	94	6	94.0					

QA/QC SAMPLES[a]

TOPSMELT (*A. affinis*)

SAMPLE ID	CONC (% or µg/l Cu)	REP	SURVIVAL (#)	SURVIVAL (%)	MEAN SURVIVAL (%)	STD DEV	% of CONTROL[2]	P-VALUE[b]	SIG DIFF FROM CONTROL?
Natural Seawater Control	n/a	a	10	100.0	97.5	5.0	n/a	n/a	n/a
		b	10	100.0					
		c	10	100.0					
		d	9	90.0					
Salt Control 2	n/a	a	8	80.0	87.5	5.0	89.7	0.015	Yes
		b	9	90.0					
		c	9	90.0					
		d	9	90.0					
Salt Control 3	n/a	a	10	100.0	95.0	5.8	97.4	0.269	No
		b	10	100.0					
		c	9	90.0					
		d	9	90.0					

MYSIDS (*A. bahia*)

SAMPLE ID	CONC (% or µg/l Cu)	REP	SURVIVAL (#)	SURVIVAL (%)	MEAN SURVIVAL (%)	STD DEV	% of CONTROL[2]	P-VALUE[b]	SIG DIFF FROM CONTROL?
Natural Seawater Control	n/a	a	10	100.0	100.0	0.0	100.0	n/a	n/a
		b	10	100.0					
		c	10	100.0					
Salt Control 1	n/a	a	10	100.0	100.0	0.0	100.0	n/a	No
		b	10	100.0					
		c	10	100.0					
Salt Control 2	n/a	a	10	100.0	100.0	0.0	100.0	n/a	No
		b	10	100.0					
		c	10	100.0					

MUSSELS (*M. galloprovincialis*)

SAMPLE ID	CONC (% or µg/l Cu)	REP.	# NORMAL	# ABNORMAL	NORM DEVEL (%)	MEAN NORM DEV (%)	STD DEV	% of CONTROL[2]	P-VALUE[b]	SIG DIFF FROM CONTROL?
Natural Seawater Control	n/a	a	99	1	99.0	96.2	3.6	n/a	n/a	n/a
		b	97	3	97.0					
		c	92	8	92.0					
		d	100	0	100.0					
		e	93	7	93.0					
Brine Control	n/a	a	98	2	98.0	94.4	3.3	98.1	0.215	No
		b	91	9	91.0					
		c	91	9	91.0					
		d	95	5	95.0					
		e	97	3	97.0					

SUMMARY RESULTS- QA/QC

COPPER REFERENCE TOXICANT TEST

SPECIES	NOEC (µg/l)	LOEC (µg/l)	EC50 (µg/l)	95% C.L. (µg/l)
TOPSMELT	100.0	200.0	161.5	135.2-193.3
MYSIDS	100.0	200.0	237.4	212.4-266.0
MUSSELS	5.0	100.0	7.5	n/a

[a]Controls (QA/QC) correspond to all samples from SDB2

[b]Student's t-test with a one tailed distribution and two sample unequal variance

[c] p-value is significant because treatment had a significantly greater proportion normal compared to the control
n/a - t-test not used since control and treatment have same percentage survival

[1]Controls were the Bay water samples taken prior to storm (PRE) with comparable sample ID

[2]Controls were Scripps filtered seawater

SDB2A – 12/11/2003

BAY SAMPLES

TOPSMELT (*A. affinis*)

SAMPLE ID	CONC (%)	REP	SURVIVAL (#)	SURVIVAL (%)	MEAN SURVIVAL (%)	STD DEV	% of CONTROL[2]	P-VALUE[b]	SIG DIFF FROM CONTROL?
SUB-BAY11B-SDB2A-PRE	100	a	5	100.0	100.0	0.0	105.3	0.196	No
		b	5	100.0					
		c	5	100.0					
		d	5	100.0					
SUB-BAY23C&E-SDB2A-PRE	100	a	4	80.0	90.0	11.5	94.7	0.269	No
		b	4	80.0					
		c	5	100.0					
		d	5	100.0					
SUB-BAY26-SDB2A-PRE	100	a	5	100.0	95.0	10.0	100.0	0.500	No
		b	5	100.0					
		c	4	80.0					
		d	5	100.0					

MYSIDS (*A. bahia*)

SAMPLE ID	CONC (%)	REP	SURVIVAL (#)	SURVIVAL (%)	MEAN SURVIVAL (%)	STD DEV	% of CONTROL[2]	P-VALUE[b]	SIG DIFF FROM CONTROL?
SUB-BAY11B-SDB2A-PRE	100	a	9	90.0	93.3	5.8	96.6	0.259	No
		b	9	90.0					
		c	10	100.0					
SUB-BAY23C&E-SDB2A-PRE	100	a	10	100.0	96.7	5.8	100.0	0.500	No
		b	9	90.0					
		c	10	100.0					
SUB-BAY26-SDB2A-PRE	100	a	10	100.0	100.0	0.0	103.4	0.211	No
		b	10	100.0					
		c	10	100.0					

MUSSELS (*M. galloprovincialis*)

SAMPLE ID	CONC (%)	REP.	NORM DEVEL (%)	MEAN NORM DEV (%)	STD DEV	% of CONTROL[2]	P-VALUE[b]	SIG DIFF FROM CONTROL?
SUB-BAY11B-SDB2A-PRE	100	a	94.8	86.0	7.0	95.0	0.146	No
		b	77.8					
		c	85.6					
		d	86.0					
SUB-BAY23C&E-SDB2A-PRE	100	a	90.2	88.1	2.3	97.3	0.087	No
		b	86.0					
		c	90.0					
		d	86.1					
SUB-BAY26-SDB2A-PRE	100	a	89.2	86.7	3.2	95.7	0.051	No
		b	84.9					
		c	83.1					
		d	89.6					

QA/QC SAMPLES[a]

TOPSMELT (*A. affinis*)

SAMPLE ID	CONC (% or µg/l Cu)	REP	SURVIVAL (#)	SURVIVAL (%)	MEAN SURVIVAL (%)	STD DEV	% of CONTROL[2]	P-VALUE[b]	SIG DIFF FROM CONTROL?
Scripps Control	n/a	a	10	100.0	95.0	10.0	n/a	n/a	n/a
		b	10	100.0					
		c	8	80.0					
		d	10	100.0					
Copper Ref. Tox.	50	a	4	80.0	95.0	10.0	100.0	0.500	No
		b	5	100.0					
		c	5	100.0					
		d	5	100.0					
	100	a	5	100.0	90.0	11.5	90.0	0.282	No
		b	5	100.0					
		c	2	40.0					
		d	5	100.0					
	200	a	2	40.0	0.0	0.0	0.0	0.048	Yes
		b	4	80.0					
		c	0	0.0					
		d	4	80.0					
	400	a	0	0.0	0.0	0.0	0.0	0.000	Yes
		b	0	0.0					
		c	1	20.0					
		d	0	0.0					

MYSIDS (*A. bahia*)

SAMPLE ID	CONC (% or µg/l Cu)	REP	SURVIVAL (#)	SURVIVAL (%)	MEAN SURVIVAL (%)	STD DEV	% of CONTROL[2]	P-VALUE[b]	SIG DIFF FROM CONTROL?
Scripps Control	n/a	a	10	100.0	96.7	5.8	n/a	n/a	n/a
		b	10	100.0					
		c	9	90.0					
Copper Ref. Tox.	25	a	10	100.0	100.0	0.0	103.4	0.211	No
		b	10	100.0					
		c	10	100.0					
	50	a	10	100.0	100.0	0.0	103.4	0.211	No
		b	10	100.0					
		c	10	100.0					
	100	a	10	100.0	96.7	5.8	100.0	0.500	No
		b	10	100.0					
		c	9	90.0					
	200	a	9	90.0	93.3	5.8	96.6	0.259	No
		b	9	90.0					
		c	10	100.0					
	400	a	0	0.0	3.3	5.8	3.4	0.000	Yes
		b	1	10.0					
		c	0	0.0					

MUSSELS (*M. galloprovincialis*)

SAMPLE ID	CONC (% or µg/l Cu)	REP.	NORM DEVEL (%)	MEAN NORM DEV (%)	STD DEV	% of CONTROL[2]	P-VALUE[b]	SIG DIFF FROM CONTROL?
Scripps Control	n/a	a	87.8	90.6	2.2	n/a	n/a	n/a
		b	93.0					
		c	90.1					
		d	91.4					
Copper Ref. Tox.	2.9	a	88.0	92.0	2.7	101.6	0.220	No
		b	94.0					
		c	93.0					
		d	93.0					
	4.1	a	91.4	91.5	4.2	101.0	0.355	No
		b	86.0					
		c	92.4					
		d	96.2					
	5.9	a	70.5	71.9	1.1	79.4	0.000	**Yes**
		b	72.2					
		c	71.8					
		d	73.2					
	8.4	a	10.9	10.2	4.6	11.3	0.000	**Yes**
		b	16.0					
		c	8.9					
		d	5.0					
	12.0	a	2.0	2.0	0.8	2.2	0.000	**Yes**
		b	2.0					
		c	3.0					
		d	1.0					
	17.2	a	0.0	0.0	0.0	0.0	0.000	**Yes**
		b	0.0					
		c	0.0					
		d	0.0					

SUMMARY RESULTS- QA/QC

COPPER REFERENCE TOXICANT TEST

SPECIES	NOEC (µg/l)	LOEC (µg/l)	EC50 (µg/l)	95% C.L. (µg/l)
TOPSMELT	100	200	197.0	146-246
MYSIDS	200	400	277	241-316
MUSSELS	4.1	5.9	6.83	5.9-7.6

[a]Controls (QA/QC) correspond to all samples from SDB2A

[b]Student's t-test with a one tailed distribution and two sample unequal variance

[c] p-value is significant because treatment had a significantly greater proportion normal compared to the control
n/a - t-test not used since control and treatment have same percentage survival

[1]Controls were the Bay water samples taken prior to storm (PRE) with comparable sample ID

[2]Controls were Scripps filtered seawater

SDB3 – 02/02/2004

OUTFALLS

TOPSMELT (*A. affinis*)

SAMPLE ID	CONC (%)	REP	SURVIVAL (#)	SURVIVAL (%)	MEAN SURVIVAL (%)	STD DEV	% of CONTROL[1]	P-VALUE[b]	SIG DIFF FROM CONTROL?
SUB-OF11B-SDB3-FF	12.5	a	5	100.0	95.0	10.0	100.0	0.500	No
		b	5	100.0					
		c	5	100.0					
		d	4	80.0					
	25	a	5	100.0	100.0	0.0	105.3	0.196	No
		b	5	100.0					
		c	5	100.0					
		d	5	100.0					
	50	a	5	100.0	95.0	10.0	100.0	0.500	No
		b	5	100.0					
		c	4	80.0					
		d	5	100.0					
	100	a	5	100.0	100.0	0.0	105.3	0.196	No
		b	5	100.0					
		c	5	100.0					
		d	5	100.0					
SUB-OF11B-SDB3-COMP	12.5	a	5	100.0	100.0	0.0	105.3	0.196	No
		b	5	100.0					
		c	5	100.0					
		d	5	100.0					
	25	a	5	100.0	100.0	0.0	105.3	0.196	No
		b	5	100.0					
		c	5	100.0					
		d	5	100.0					
	50	a	5	100.0	100.0	0.0	105.3	0.196	No
		b	5	100.0					
		c	5	100.0					
		d	5	100.0					
	100	a	5	100.0	100.0	0.0	105.3	0.196	No
		b	5	100.0					
		c	5	100.0					
		d	5	100.0					
SUB-OF23C&E-SDB3-FF	12.5	a	4	80.0	95.0	10.0	95.0	0.196	No
		b	5	100.0					
		c	5	100.0					
		d	5	100.0					
	25	a	5	100.0	100.0	0.0	100.0	n/a	No
		b	5	100.0					
		c	5	100.0					
		d	5	100.0					
	50	a	5	100.0	95.0	10.0	95.0	0.196	No
		b	4	80.0					
		c	5	100.0					
		d	5	100.0					
	100	a	4	80.0	95.0	10.0	95.0	0.196	No
		b	5	100.0					
		c	5	100.0					
		d	5	100.0					
SUB-OF23C&E-SDB3-COMP	12.5	a	5	100.0	100.0	0.0	100.0	n/a	No
		b	5	100.0					
		c	5	100.0					
		d	5	100.0					
	25	a	5	100.0	100.0	0.0	100.0	n/a	No
		b	5	100.0					
		c	5	100.0					
		d	5	100.0					
	50	a	5	100.0	100.0	0.0	100.0	n/a	No
		b	5	100.0					
		c	5	100.0					
		d	5	100.0					

MYSIDS (*A. bahia*)

SAMPLE ID	CONC (%)	REP	SURVIVAL (#)	SURVIVAL (%)	MEAN SURVIVAL (%)	STD DEV	% of CONTROL[1]	P-VALUE[b]	SIG DIFF FROM CONTROL?
SUB-OF11B-SDB3-FF	12.5	a	10	100.0	100.0	0.0	100.0	n/a	No
		b	10	100.0					
		c	10	100.0					
	25	a	10	100.0	100.0	0.0	100.0	n/a	No
		b	10	100.0					
		c	10	100.0					
	50	a	10	100.0	96.7	5.8	96.7	0.500	No
		b	10	100.0					
		c	9	90.0					
	100	a	7	70.0	80.0	10.0	80.0	0.041	Yes
		b	8	80.0					
		c	9	90.0					
SUB-OF11B-SDB3-COMP	12.5	a	10	100.0	100.0	0.0	100.0	NT	
		b	10	100.0					
	50	a	9	90.0	90.0	0.0	90.0	NT	
		b	9	90.0					
	100	a	7	70.0	80.0	14.1	80.0	NT	
		b	9	90.0					
SUB-OF23C&E-SDB3-FF	12.5	a	10	100.0	100.0	0.0	103.4	0.211	No
		b	10	100.0					
		c	10	100.0					
	25	a	10	100.0	100.0	0.0	103.4	0.211	No
		b	10	100.0					
		c	10	100.0					
	50	a	10	100.0	96.7	5.8	100.0	0.500	No
		b	9	90.0					
		c	10	100.0					
	100	a	8	80.0	76.7	5.8	79.3	0.007	Yes
		b	7	70.0					
		c	8	80.0					
SUB-OF23C&E-SDB3-COMP	12.5	a	10	100.0	100.0	0.0	103.4	0.211	No
		b	10	100.0					
		c	10	100.0					
	25	a	10	100.0	100.0	0.0	103.4	0.211	No
		b	10	100.0					
		c	10	100.0					
	50	a	10	100.0	96.7	5.8	100.0	0.500	No
		b	9	90.0					
		c	10	100.0					
	100	a	10	100.0	86.7	11.5	89.7	0.137	No
		b	8	80.0					
		c	8	80.0					
SUB-OF26-SDB3-FF	12.5	a	10	100.0	93.3	11.5	93.3	0.211	No
		b	8	80.0					
		c	10	100.0					
	25	a	10	100.0	96.7	5.8	96.7	0.211	No
		b	9	90.0					
		c	10	100.0					
	50	a	10	100.0	96.7	5.8	96.7	0.211	No
		b	9	90.0					
		c	9	100.0					
	100	a	10	100.0	90.0	10.0	90.0	0.113	No
		b	8	80.0					
		c	9	90.0					

MYSIDS (*A. bahia*)

SAMPLE ID	CONC (%)	REP	SURVIVAL (#)	SURVIVAL (%)	MEAN SURVIVAL (%)	STD DEV	% of CONTROL[1]	P-VALUE[b]	SIG DIFF FROM CONTROL?
SUB-OF26-SDB3-COMP	12.5	a	10	100.0	100.0	0.0	100.0	n/a	No
		b	10	100.0					
		c	10	100.0					
	25	a	10	100.0	100.0	0.0	100.0	n/a	No
		b	10	100.0					
		c	10	100.0					
	50	a	10	100.0	96.7	5.8	96.7	0.211	No
		b	10	100.0					
		c	9	90.0					
	100	a	8	80.0	70.0	17.3	75.8	0.048	Yes
		b	5	50.0					
		c	8	80.0					

MUSSELS (*M. galloprovincialis*)

SAMPLE ID	CONC (%)	REP.	NORM DEVEL (%)	MEAN NORM DEV (%)	STD DEV	% of CONTROL[1]	P-VALUE[b]	SIG DIFF FROM CONTROL?
SUB-OF11B-SDB3-FF	8.25	a	97.4	96.3	1.9	101.6	0.253	No
		b	93.6					
		c	96.5					
		d	97.8					
	16.5	a	96.1	97.7	2.1	103.0	0.122	No
		b	95.7					
		c	99.5					
		d	99.4					
	33.0	a	94.7	93.2	1.7	98.3	0.227	No
		b	91.4					
		c	92.1					
		d	94.4					
	66.0	a	0.0	4.9	4.0	5.2	0.000	Yes
		b	7.3					
		c	9.0					
		d	3.3					
SUB-OF11B-SDB3-COMP	8.25	a	93.8	96.1	1.7	101.3	0.279	No
		b	95.8					
		c	97.2					
		d	97.6					
	16.5	a	99.4	98.0	1.2	103.3	0.101	No
		b	97.6					
		c	96.7					
		d	98.2					
	33.0	a	97.5	95.4	2.2	100.6	0.396	No
		b	92.4					
		c	96.2					
		d	95.6					
	66.0	a	13.0	17.9	10.3	18.9	0.000	Yes
		b	13.7					
		c	33.3					
		d	11.7					

MUSSELS (*M. galloprovincialis*)

SAMPLE ID	CONC (%)	REP.	NORM DEVEL (%)	MEAN NORM DEV (%)	STD DEV	% of CONTROL[1]	P-VALUE[b]	SIG DIFF FROM CONTROL?
SUB-OF23C&E-SDB3-FF	8.25	a	95.2	95.4	2.4	108.7	0.010	Yes[c]
		b	93.2					
		c	98.7					
		d	94.3					
	16.5	a	94.2	88.9	10.9	101.3	0.425	No
		b	91.5					
		c	97.1					
		d	72.9					
	33.0	a	17.2	9.8	5.5	11.1	0.000	Yes
		b	10.5					
		c	7.1					
		d	4.3					
	66.0	a	0.0	0.0	0.0	0.0	0.000	Yes
		b	0.0					
		c	0.0					
		d	0.0					
SUB-OF23C&E-SDB3-COMP	8.25	a	93.4	91.2	7.8	103.9	0.229	No
		b	97.5					
		c	94.1					
		d	79.9					
	16.5	a	87.0	80.3	11.1	91.4	0.137	No
		b	75.7					
		c	91.4					
		d	66.9					
	33.0	a	0.0	0.0	0.0	0.0	0.000	Yes
		b	0.0					
		c	0.0					
		d	0.0					
	66.0	a	0.0	0.0	0.0	0.0	0.000	Yes
		b	0.0					
		c	0.0					
		d	0.0					
SUB-OF26-SDB3-FF	8.25	a	96.3	96.4	0.3	101.4	0.130	No
		b	96.8					
		c	96.3					
		d	-					
	16.5	a	90.7	92.6	3.5	97.3	0.130	No
		b	96.5					
		c	94.4					
		d	88.8					
	33.0	a	83.8	74.5	12.9	78.3	0.024	Yes
		b	79.4					
		c	79.5					
		d	55.3					
	66.0	a	7.3	2.6	3.1	2.8	0.000	Yes
		b	0.7					
		c	2.0					
		d	0.6					

Dash indicates no data (replicate was spilled or organisms not added)

[a]Controls (QA/QC) correspond to all samples from SDB3

[b]Student's t-test with a one tailed distribution and two sample unequal variance

[c] p-value is significant because treatment had a significantly greater proportion normal compared to the control

n/a - t-test not used since control and treatment have same percentage survival

NT-No statistical test due to difference in replication

[1]Controls were the Bay water samples taken prior to storm (PRE) with comparable sample ID

[2]Controls were Scripps filtered seawater

Notes:

1) 23CE Pr did not possess normal development for any replicate. This was not a toxic sample, however, because both outfall samples associated with this site had high normal development at the lower concentrations, which used this receiving water sample as the diluent. Scripps natural seawater controls served as the controls for outfall 23CE for data analysis.

2) OF26 Comp was accidentally salted up instead of adjusted with brine. Embryos did not develop properly in the salt control (as expected, which is why these tests are conducted with hypersaline brine), so this data was not tabulated.

BAY SAMPLES

TOPSMELT (*A. affinis*)

SAMPLE ID	CONC (%)	REP	SURVIVAL (#)	SURVIVAL (%)	MEAN SURVIVAL (%)	STD DEV	% of CONTROL[2]	P-VALUE[b]	SIG DIFF FROM CONTROL?
SUB-BAY11B-SDB3-PRE	100	a	5	100.0	95.0	10.0	95.0	0.196	No
		b	4	80.0					
		c	5	100.0					
		d	5	100.0					
SUB-BAY11B-SDB3-DUR	100	a	5	100.0	100.0	0.0	100.0	n/a	No
		b	5	100.0					
		c	5	100.0					
		d	5	100.0					
SUB-BAY11B-SDB3-AFT	100	a	5	100.0	100.0	0.0	100.0	n/a	No
		b	5	100.0					
		c	5	100.0					
		d	5	100.0					
SUB-BAY23C&E-SDB3-PRE	100	a	5	100.0	100.0	0.0	100.0	n/a	No
		b	5	100.0					
		c	5	100.0					
		d	5	100.0					
SUB-BAY23C&E-SDB3-DUR	100	a	5	100.0	95.0	10.0	95.0	0.196	No
		b	4	80.0					
		c	5	100.0					
		d	5	100.0					
SUB-BAY23C&E-SDB3-AFT	100	a	5	100.0	95.0	10.0	95.0	0.196	No
		b	4	80.0					
		c	5	100.0					
		d	5	100.0					
SUB-BAY26-SDB3-PRE	100	a	5	100.0	90.0	20.0	90.0	0.196	No
		b	5	100.0					
		c	3	60.0					
		d	5	100.0					
SUB-BAY26-SDB3-DUR	100	a	5	100.0	100.0	0.0	100.0	n/a	No
		b	5	100.0					
		c	5	100.0					
		d	5	100.0					
SUB-BAY26-SDB3-AFT	100	a	5	100.0	100.0	0.0	100.0	n/a	No
		b	5	100.0					
		c	5	100.0					
		d	5	100.0					
SUB-BAY26A-SDB3-PRE	100	a	5	100.0	90.0	20.0	90.0	0.196	No
		b	5	100.0					
		c	3	60.0					
		d	5	100.0					
SUB-BAY26A-SDB3-DUR	100	a	5	100.0	100.0	0.0	100.0	n/a	No
		b	5	100.0					
		c	5	100.0					
		d	5	100.0					
SUB-BAY26A-SDB3-AFT	100	a	5	100.0	100.0	0.0	100.0	n/a	No
		b	5	100.0					
		c	5	100.0					
		d	5	100.0					

MYSIDS (*A. bahia*)

SAMPLE ID	CONC (%)	REP	SURVIVAL (#)	SURVIVAL (%)	MEAN SURVIVAL (%)	STD DEV	% of CONTROL[2]	P-VALUE[b]	SIG DIFF FROM CONTROL?
SUB-BAY11B-SDB3-PRE	100	a	10	100.0	100.0	0.0	100.0	0.211	No
		b	10	100.0					
		c	10	100.0					
SUB-BAY11B-SDB3-DUR	100	a	10	100.0	100.0	0.0	100.0	0.211	No
		b	10	100.0					
		c	10	100.0					
SUB-BAY11B-SDB3-AFT	100	a	10	100.0	96.7	5.8	96.7	0.500	No
		b	10	100.0					
		c	9	90.0					
SUB-BAY23C&E-SDB3-PRE	100	a	10	100.0	96.7	5.8	96.7	0.500	No
		b	10	100.0					
		c	9	90.0					
SUB-BAY23C&E-SDB3-DUR	100	a	10	100.0	100.0	0.0	100.0	0.211	No
		b	10	100.0					
		c	10	100.0					
SUB-BAY23C&E-SDB3-AFT	100	a	10	100.0	100.0	0.0	100.0	0.211	No
		b	10	100.0					
		c	10	100.0					
SUB-BAY26-SDB3-PRE	100	a	10	100.0	100.0	0.0	100.0	0.211	No
		b	10	100.0					
		c	10	100.0					
SUB-BAY26-SDB3-DUR	100	a	10	100.0	100.0	0.0	100.0	0.211	No
		b	10	100.0					
		c	10	100.0					
SUB-BAY26-SDB3-AFT	100	a	10	100.0	96.7	5.8	96.7	0.500	No
		b	10	100.0					
		c	9	90.0					
SUB-BAY26A-SDB3-PRE	100	a	10	100.0	100.0	0.0	100.0	0.211	No
		b	10	100.0					
		c	10	100.0					
SUB-BAY26A-SDB3-DUR	100	a	10	100.0	100.0	0.0	100.0	0.211	No
		b	10	100.0					
		c	10	100.0					
SUB-BAY26A-SDB3-AFT	100	a	10	100.0	100.0	0.0	100.0	0.211	No
		b	10	100.0					
		c	10	100.0					

MUSSELS (*M. galloprovincialis*)

SAMPLE ID	CONC (%)	REP.	NORM DEVEL (%)	MEAN NORM DEV (%)	STD DEV	% of CONTROL[a]	P-VALUE[b]	SIG DIFF FROM CONTROL?
SUB-BAY11B-SDB3-PRE	100	a	92.4	94.8	3.0	108.0	0.021	Yes[c]
		b	98.2					
		c	93.9					
		d	-					
SUB-BAY11B-SDB3-DUR	100	a	94.4	94.3	0.6	107.4	0.026	Yes[c]
		b	94.0					
		c	95.1					
		d	93.7					
SUB-BAY11B-SDB3-AFT	100	a	95.5	96.1	1.8	109.5	0.009	Yes[c]
		b	97.8					
		c	93.8					
		d	97.4					
SUB-BAY23C&E-SDB3-PRE	100	a	0.0	0.0	0.0	0.0	0.000	Yes
		b	0.0					
		c	0.0					
		d	0.0					
SUB-BAY23C&E-SDB3-DUR	100	a	95.3	94.8	0.5	108.0	0.024	Yes[c]
		b	94.1					
		c	94.7					
		d	94.9					
SUB-BAY23C&E-SDB3-AFT	100	a	93.2	95.7	2.2	109.1	0.009	Yes[c]
		b	98.1					
		c	97.0					
		d	94.6					
SUB-BAY26-SDB3-PRE	100	a	80.0	89.6	7.6	102.1	0.336	No
		b	87.7					
		c	93.5					
		d	97.4					
SUB-BAY26-SDB3-DUR	100	a	96.0	97.3	1.9	110.9	0.006	Yes[c]
		b	99.4					
		c	95.5					
		d	98.4					
SUB-BAY26-SDB3-AFT	100	a	93.5	95.9	1.8	109.2	0.010	Yes[c]
		b	95.5					
		c	97.6					
		d	96.9					
SUB-BAY26A-SDB3-PRE	100	a	95.7	95.1	1.9	108.4	0.013	Yes[c]
		b	97.3					
		c	92.8					
		d	94.8					
SUB-BAY26A-SDB3-DUR	100	a	92.5	94.0	1.6	107.1	0.021	Yes[c]
		b	93.4					
		c	96.2					
		d	94.0					
SUB-BAY26A-SDB3-AFT	100	a	92.4	93.9	2.3	107.0	0.020	Yes[c]
		b	94.2					
		c	97.0					
		d	92.1					

QA/QC SAMPLES[a]

TOPSMELT (*A. affinis*)

SAMPLE ID	CONC (% or µg/l Cu)	REP	SURVIVAL (#)	SURVIVAL (%)	MEAN SURVIVAL (%)	STD DEV	% of CONTROL[2]	P-VALUE[b]	SIG DIFF FROM CONTROL?
Scripps Control	n/a	a	5	100.0	100.0	0.0	n/a	n/a	n/a
		b	5	100.0					
		c	5	100.0					
		d	5	100.0					
Salt Control	n/a	a	5	100.0	100.0	0.0	100.0	n/a	No
		b	5	100.0					
		c	5	100.0					
		d	5	100.0					
Copper Ref. Tox.	50	a	5	100.0	100.0	0.0	100.0	n/a	No
		b	5	100.0					
		c	5	100.0					
		d	5	100.0					
	100	a	5	100.0	100.0	0.0	100.0	n/a	No
		b	5	100.0					
		c	5	100.0					
		d	5	100.0					
	200	a	5	100.0	50.0	34.6	50.0	0.032	Yes
		b	2	40.0					
		c	1	20.0					
		d	2	40.0					
	400	a	0	0.0	10.0	11.5	10.0	0.000	Yes
		b	1	20.0					
		c	1	20.0					
		d	0	0.0					

MYSIDS (*A. bahia*)

SAMPLE ID	CONC (% or µg/l Cu)	REP	SURVIVAL (#)	SURVIVAL (%)	MEAN SURVIVAL (%)	STD DEV	% of CONTROL[2]	P-VALUE[b]	SIG DIFF FROM CONTROL?
Scripps Control	n/a	a	10	100.0	96.7	5.8	n/a	n/a	n/a
		b	9	90.0					
		c	10	100.0					
Salt Control	n/a	a	9	90.0	93.3	5.8	96.6	0.259	No
		b	10	100.0					
		c	9	90.0					
Copper Ref. Tox.	25	a	10	100.0	100.0	0.0	107.1	0.211	No
		b	10	100.0					
		c	10	100.0					
	50	a	10	100.0	100.0	0.0	100.0	0.211	No
		b	10	100.0					
		c	10	100.0					
	100	a	10	100.0	96.7	5.8	96.7	0.500	No
		b	10	100.0					
		c	9	90.0					
	200	a	9	90.0	83.3	5.8	86.2	0.024	Yes
		b	8	80.0					
		c	8	80.0					
	400	a	2	20.0	30.0	10.0	36.0	0.001	Yes
		b	4	40.0					
		c	3	30.0					

MUSSELS (*M. galloprovincialis*)

SAMPLE ID	CONC (% or µg/l Cu)	REP.	NORM DEVEL (%)	MEAN NORM DEV (%)	STD DEV	% of CONTROL[2]	P-VALUE[b]	SIG DIFF FROM CONTROL?
Scripps Control	n/a	a	90.8	87.8	2.8	n/a	n/a	n/a
		b	85.1					
		c	87.4					
		d	-					
Brine Control	n/a	a	92.4	93.9	2.3	107.0	0.020	**Yes[c]**
		b	94.2					
		c	97.0					
		d	92.1					
Copper Ref. Tox.	2.9	a	70.7	76.2	6.8	86.8	0.018	**Yes**
		b	77.6					
		c	85.3					
		d	71.1					
	4.1	a	61.4	58.1	2.2	66.2	0.000	**Yes**
		b	57.6					
		c	57.0					
		d	56.4					
	5.9	a	11.0	19.2	10.3	21.9	0.000	**Yes**
		b	28.7					
		c	27.7					
		d	9.7					
	8.4	a	3.7	6.9	3.9	7.9	0.000	**Yes**
		b	4.1					
		c	12.2					
		d	7.7					
	12.0	a	1.2	1.5	1.4	1.7	0.000	**Yes**
		b	0.0					
		c	3.4					
		d	1.3					
	17.2	a	0.0	0.0	0.0	0.0	0.000	**Yes**
		b	0.0					
		c	0.0					
		d	0.0					

SUMMARY RESULTS- QA/QC

COPPER REFERENCE TOXICANT TEST

SPECIES	NOEC (µg/l)	LOEC (µg/l)	EC50 (µg/l)	95% C.L. (µg/l)
TOPSMELT	100	200	218.0	181-264
MYSIDS	100	200	315	264-393
MUSSELS	2.9	4.1	4.60	4.1-5.1

Dash indicates no data (replicate was spilled or organisms not added)

[a]Controls (QA/QC) correspond to all samples from SDB3

[b]Student's t-test with a one tailed distribution and two sample unequal variance

[c] p-value is significant because treatment had a significantly greater proportion normal compared to the control
n/a - t-test not used since control and treatment have same percentage survival

[1]Controls were the Bay water samples taken prior to storm (PRE) with comparable sample ID

[2]Controls were Scripps filtered seawater

Notes:

1) 23CE Pr did not possess normal development for any replicate. This was not a toxic sample, however, because both outfall samples associated with this site had high normal development at the lower concentrations, which used this receiving water sample as the diluent. Scripps natural seawater controls served as the controls for outfall 23CE for data analysis.
2) OF26 Comp was accidentally salted up instead of adjusted with brine. Embryos did not develop properly in the salt control (as expected, which is why these tests are conducted with hypersaline brine), so this data was not tabulated.

WATER QUALITY

TOPSMELT (*A. affinis*)

Sample ID	Effluent Concentration (% or µg/l Cu)	Rep	pH (SU)	Dissolved Oxygen (mg/l)	Temp. (°C)	Salinity (‰)
SUB-OF11B-SDB3-FF	12.5%	a	7.62-7.98	5.8-6.9	19.1-21.1	34-35
	50%	a	7.52-8.0	5.4-6.9	19.1-21.6	33-35
	100%	a	7.59-8.01	5.5-7.8	19.1-21.6	32-34
SUB-OF11B-SDB3-COMP	12.5%	a	7.67-7.81	6.0-6.2	19.3-21.4	34-35
	50%	a	7.68-8.48	5.9-7.3	19.3-21.4	34-36
	100%	a	7.74-8.76	5.3-7.2	19.3-21.2	35-37
SUB-OF23C&E-SDB3-FF	12.5%	a	7.6-7.9	5.5-6.5	19.3-21.5	33-35
	50%	a	7.5-7.9	5.8-6.6	19.3-21.4	33-35
	100%	a	7.4-8.0	4.7-6.4	19.3-21.4	33-34
SUB-OF23C&E-SDB3-COMP	12.5%	a	7.6-7.9	6.2-7.1	19.3-21.5	33-36
	50%	a	7.6-7.9	5.7-7.1	19.3-21.5	32-35
	100%	a	7.5-8.0	5.5-7.0	19.3-21.5	32-35
SUB-OF26-SDB3-FF	12.5%	a	7.62-7.74	6.0-6.8	19.3-21.4	33-36
	50%	a	7.6-7.73	6.1-6.8	19.3-21.4	32-35
	100%	a	7.52-8.03	5.4-6.2	19.3-21.3	32-36
SUB-OF26-SDB3-COMP	12.5%	a	7.63-7.69	6.1-6.8	19.3-21.4	34-36
	50%	a	7.56-7.7	5.9-6.6	19.3-21.4	34-36
	100%	a	7.48-7.7	5.2-6.1	19.3-21.3	35-37
SUB-BAY11B-SDB3-PRE	100%	a	7.61-7.92	5.8-7.0	19.3-21.4	33-35
SUB-BAY11B-SDB3-DUR	100%	a	7.6-7.8	5.8-7.1	19.0-21.2	33-37
SUB-BAY11B-SDB3-AFT	100%	a	7.6-7.9	6.2-7.1	19.0-20.9	33-36
SUB-BAY23C&E-SDB3-PRE	100%	a	7.67-7.91	6.2-7.0	19.3-21.4	33-35
SUB-BAY23C&E-SDB3-DUR	100%	a	7.6-7.8	6.0-7.3	18.8-21.1	33-35
SUB-BAY23C&E-SDB3-AFT	100%	a	7.6-7.7	6.1-7.0	19.0-21.0	33-36
SUB-BAY26-SDB3-PRE	100%	a	7.52-7.91	5.5-6.7	19.3-21.3	33-36
SUB-BAY26-SDB3-DUR	100%	a	7.6-9	5.7-7.1	19.1-21.3	34-36
SUB-BAY26-SDB3-AFT	100%	a	7.6-7.9	5.7-7.1	19.1-21.1	34-36
SUB-BAY26A-SDB3-PRE	100%	a	7.7-7.9	6.1-7.1	19.3-21.5	33-35
SUB-BAY26A-SDB3-DUR	100%	a	7.7-7.9	5.9-6.9	19.3-21.5	33-34
SUB-BAY26A-SDB3-AFT	100%	a	7.7-7.9	6.1-6.9	19.3-21.3	33-36
Scripps Control	0	a	7.6-7.8	6.2-7.2	18.9-20.5	34-36
Cu Ref Tox	100 µg/l	a	7.6-7.9	6.0-7.3	19.0-20.8	34-35
	400 µg/l	a	7.6-7.8	5.9-7.1	18.9-20.7	34-37

MYSIDS (*A. bahia*)

Sample ID	Effluent Concentration (% or µg/l Cu)	Rep	pH (SU)	Dissolved Oxygen (mg/l)	Temp. (°C)	Salinity (‰)
SUB-OF11B-SDB3-FF	100%	a	7.5-7.9	4.1-6.4	19.0-20.4	32-34
SUB-OF11B-SDB3-COMP	100%	a	7.8-8.7	4.4-7.4	18.9-20.4	35-37
SUB-OF23C&E-SDB3-FF	100%	a	7.6-8.0	4.5-6.6	18.8-20.7	33-35
SUB-OF23C&E-SDB3-COMP	100%	a	7.4-8.0	4.1-7.5	18.8-20.8	36-37
SUB-OF26-SDB3-FF	100%	a	7.4-7.9	4.3-6.3	18.8-20.8	33-34
SUB-OF26-SDB3-COMP	100%	a	7.4-8.0	4.6-6.9	18.6-20.5	34-35
SUB-BAY11B-SDB3-PRE	100%	a	7.5-7.9	4.7-7.1	19.0-20.5	34-36
SUB-BAY11B-SDB3-DUR	100%	a	7.5-7.7	5.7-6.6	18.9-20.2	34-35
SUB-BAY11B-SDB3-AFT	100%	a	7.4-7.8	5.3-6.6	18.8-20.4	34-35
SUB-BAY23C&E-SDB3-PRE	100%	a	7.5-8.0	4.9-7.0	18.9-22.1	35-36
SUB-BAY23C&E-SDB3-DUR	100%	a	7.6-7.7	6.0-6.3	18.9-20.3	34-36
SUB-BAY23C&E-SDB3-AFT	100%	a	7.6-7.7	6.0-6.3	18.8-20.2	34-35
SUB-BAY26-SDB3-PRE	100%	a	7.6-7.9	5.1-7.1	19.0-20.8	35-36
SUB-BAY26-SDB3-DUR	100%	a	7.6-7.7	6.0-6.6	18.9-20.8	34-35
SUB-BAY26-SDB3-AFT	100%	a	7.7	7	18.8	35
SUB-BAY26A-SDB3-PRE	100%	a	7.70-7.72	5.8-6.9	18.7-19.0	34-35
SUB-BAY26A-SDB3-DUR	100%	a	7.63-7.67	5.3-6.2	18.8-19.0	34
SUB-BAY26A-SDB3-AFT	100%	a	7.61-7.69	6.2-6.7	18.9-20.8	34-35
Scripps Control	0	a	7.7-8.0	5.1-6.2	18.9-19.9	34-37
Cu Ref Tox	100 µg/l	a	7.6-7.9	5.8-7.0	19.0-20.4	34-35
	400 µg/l	a	7.6-7.9	6.1-7.0	18.8-20.5	35
Salt Control	0	a	7.6-7.9	5.9-7.0	19.0-20.2	35

OUTFALLS

INLAND SILVERSIDE (*M. berylina*)

SAMPLE ID	CONC (%)	MEAN SURVIVAL (%)
SUB-OF11B-TIE1-FF	25	100.0
	50	100.0
	100	96.0
SUB-OF23C&E-TIE1-FF	25	100.0
	50	96.0
	100	100.0
SUB-OF26-TIE1-FF	25	100.0
	50	100.0
	100	100.0

MYSIDS (*A. bahia*)

SAMPLE ID	CONC (%)	MEAN SURVIVAL (%)
SUB-OF11B-TIE1-FF	25	98.0
	50	100.0
	100	85.0
SUB-OF23C&E-TIE1-FF	25	93.0
	50	93.0
	100	55.0
SUB-OF26-TIE1-FF	25	95.0
	50	95.0
	100	58.0

MUSSELS (*M. galloprovincialis*)

SAMPLE ID	CONC (%)	MEAN NORM DEV (%)
SUB-OF11B-TIE1-FF	13	81.0
	25	69.0
	50	1.0
	68	0.0
SUB-OF23C&E-TIE1-FF	13	73.0
	25	0.0
	50	0.0
	68	0.0
SUB-OF26-TIE1-FF	13	70.0
	25	0.0
	50	0.0
	68	0.0

Please refer to TIE Report August 2004 for raw data and water quality

QA/QC SAMPLES[a]

INLAND SILVERSIDE (*M. berylina*)

SAMPLE ID	CONC (% or µg/l Cu)	MEAN SURVIVAL (%)
Natural Seawater Control	n/a	100.0
Salt Control	n/a	96.0

MYSIDS (*A. bahia*)

SAMPLE ID	CONC (% or µg/l Cu)	MEAN SURVIVAL (%)
Natural Seawater Control	n/a	95.0
Salt Control	n/a	98.0

MUSSELS (*M. galloprovincialis*)

SAMPLE ID	CONC (% or µg/l Cu)	MEAN NORM DEV (%)
Natural Seawater Control	n/a	81.0
Brine Control	n/a	75.0

SUMMARY RESULTS- QA/QC

COPPER REFERENCE TOXICANT TEST

SPECIES	DATE	NOEC (µg/l)	LOEC (µg/l)	EC50 (µg/l)	95% C.L. (µg/l)
INLAND SILVERSIDE	2/26/004	100	200	137.6	129.5-146.2
MYSIDS	2/27/2004	200	400	337.1	242.4-438.7
MUSSELS	2/19/2004	5	10	10.2	9.9-10.5

Please refer to TIE Report August 2004 for raw data and water quality

[a]Controls (QA/QC) correspond to all samples from TIE1

[b]Student's t-test with a one tailed distribution and two sample unequal variance

[c] p-value is significant because treatment had a significantly greater proportion normal compared to the control
n/a - t-test not used since control and treatment have same percentage survival

[1]Controls were the Bay water samples taken prior to storm (PRE) with comparable sample ID

[2]Controls were Scripps filtered seawater

BAY SAMPLES

MUSSELS (*M. galloprovincialis*)

SAMPLE ID	CONC (%)	MEAN NORM DEV (%)
SUB-BAY11B-TIE1A-AFT	100	87.0
SUB-BAY23C&E-TIE1A-AFT	100	88.0
SUB-BAY26-TIE1A-AFT	100	87.0

QA/QC SAMPLES[a]

MUSSELS (*M. galloprovincialis*)

SAMPLE ID	CONC (% or µg/l Cu)	MEAN NORM DEV (%)
Natural Seawater Control	n/a	89.0

SUMMARY RESULTS- QA/QC

COPPER REFERENCE TOXICANT TEST

SPECIES	DATE	NOEC (µg/l)	LOEC (µg/l)	EC50 (µg/l)	95% C.L. (µg/l)
MUSSELS	2/19/2004	5	10	10.2	9.9-10.5

Please refer to TIE Report August 2004 for raw data and water quality

WATER QUALITY

MUSSELS (*M. galloprovincialis*)

SAMPLE ID	Effluent Concentration (% or µg/l Cu)	pH (SU)	D.O. (mg/L)	Temp[1] (°C)	Salinity (‰)
SUB-BAY11B-TIE1A-AFT	100.0%	7.9	6.0	10.9	33.5
SUB-BAY23C&E-TIE1A-AFT	100.0%	8.1	8.3	12.4	33.4
SUB-BAY26-TIE1A-AFT	100.0%	8.2	7.9	13.8	33.1

[1] Temperature upon arrival

SDB4 – 10/17/2004

OUTFALLS

TOPSMELT (*A. affinis*)

SAMPLE ID	CONC (%)	REP	SURVIVAL (#)	SURVIVAL (%)	MEAN SURVIVAL (%)	STD DEV	% of CONTROL[1]	P-VALUE[b]	SIG DIFF FROM CONTROL?
SUB-OF11B-SDB4-FF	12.5	a	5	100.0	95.0	10.0	95.0	0.338	No
		b	4	80.0					
		c	5	100.0					
		d	5	100.0					
	25	a	5	100.0	100.0	0.0	100.0	0.196	No
		b	5	100.0					
		c	5	100.0					
		d	5	100.0					
	50	a	4	80.0	90.0	11.5	90.0	0.500	No
		b	5	100.0					
		c	5	100.0					
		d	4	80.0					
	100	a	5	100.0	85.0	19.1	85.0	0.365	No
		b	5	100.0					
		c	4	80.0					
		d	3	60.0					

MYSIDS (*A. bahia*)

SAMPLE ID	CONC (%)	REP	SURVIVAL (#)	SURVIVAL (%)	MEAN SURVIVAL (%)	STD DEV	% of CONTROL[1]	P-VALUE[b]	SIG DIFF FROM CONTROL?
SUB-OF11B-SDB4-FF	12.5	a	10	100.0	96.7	5.8	96.7	0.211	No
		b	9	90.0					
		c	10	100.0					
	25	a	9	90.0	93.3	5.8	93.3	0.092	No
		b	10	100.0					
		c	9	90.0					
	50	a	7	70.0	73.3	5.8	73.3	0.008	Yes
		b	7	70.0					
		c	8	80.0					
	100	a	6	60.0	46.7	11.5	46.7	0.008	Yes
		b	4	40.0					
		c	4	40.0					

MUSSELS (*M. galloprovincialis*)

SAMPLE ID	CONC (%)	REP.	# NORMAL	# ABNORMAL	NORM DEVEL (%)	MEAN NORM DEV (%)	STD DEV	% of CONTROL[1]	P-VALUE[b]	SIG DIFF FROM CONTROL?
SUB-OF11B-SDB4-FF	6.25	a	170	12	93.4	90.0	2.8	92.3	0.001	Yes
		b	157	13	92.4					
		c	161	25	86.6					
		d	144	17	89.4					
		e	143	19	88.3					
	12.5	a	19	120	13.7	20.3	13.7	20.8	0.000	Yes
		b	25	164	13.2					
		c	17	162	9.5					
		d	44	158	21.8					
		e	59	77	43.4					
	25	a	3	180	1.6	1.6	1.0	1.7	0.000	Yes
		b	5	176	2.8					
		c	0	180	0.0					
		d	3	176	1.7					
		e	3	148	2.0					
	50	a	0	196	0.0	0.0	0.0	0.0	0.000	Yes
		b	0	196	0.0					
		c	0	196	0.0					
		d	0	196	0.0					
		e	0	196	0.0					
	61.4	a	0	196	0.0	0.0	0.0	0.0	0.000	Yes
		b	0	196	0.0					
		c	0	196	0.0					
		d	0	196	0.0					
		e	0	196	0.0					

[a]Controls (QA/QC) correspond to all samples from SDB4

[b]Student's t-test with a one tailed distribution and two sample unequal variance

[c] p-value is significant because treatment had a significantly greater proportion normal compared to the control

n/a - t-test not used since control and treatment have same percentage survival

[1]Controls were the Bay water samples taken prior to storm (PRE) with comparable sample ID

[2]Controls were Scripps filtered seawater

BAY SAMPLES

TOPSMELT (*A. affinis*)

SAMPLE ID	CONC (%)	REP	SURVIVAL (#)	SURVIVAL (%)	MEAN SURVIVAL (%)	STD DEV	% of CONTROL[2]	P-VALUE[b]	SIG DIFF FROM CONTROL?
SUB-BAY11B-SDB4-DUR	100	a	5	100.0	90.0	20.0	90.0	0.196	No
		b	5	100.0					
		c	3	60.0					
		d	5	100.0					

MYSIDS (*A. bahia*)

SAMPLE ID	CONC (%)	REP	SURVIVAL (#)	SURVIVAL (%)	MEAN SURVIVAL (%)	STD DEV	% of CONTROL[2]	P-VALUE[b]	SIG DIFF FROM CONTROL?
SUB-BAY11B-SDB4-DUR	100	a	10	100.0	100.0	0.0	100.0	N/A	No
		b	10	100.0					
		c	10	100.0					

MUSSELS (*M. galloprovincialis*)

SAMPLE ID	CONC (%)	REP.	# NORMAL	ABNORMAL	NORM DEV (%)	MEAN NORM DEV (%)	STD DEV	% of CONTROL[2]	P-VALUE[b]	SIG DIFF FROM CONTROL?
SUB-BAY11B-SDB4-DUR	100	a	181	4	97.8	96.9	1.3	99.4	0.2105	No
		b	156	5	96.9					
		c	161	9	94.7					
		d	164	5	97.0					
		e	146	3	98.0					

QA/QC SAMPLES[a]

TOPSMELT (*A. affinis*)

SAMPLE ID	CONC (% or µg/l Cu)	REP	SURVIVAL (#)	SURVIVAL (%)	MEAN SURVIVAL (%)	STD DEV	% of CONTROL[2]	P-VALUE[b]	SIG DIFF FROM CONTROL?
Scripps Control	n/a	a	5	100.0	100.0	0.0	100.0	n/a	n/a
		b	5	100.0					
		c	5	100.0					
		d	5	100.0					
Salt Control	n/a	a	5	100.0	100.0	0.0	100.0	n/a	No
		b	5	100.0					
		c	5	100.0					
		d	5	100.0					
Copper Ref. Tox.	50	a	5	100.0	100.0	0.0	100.0	n/a	No
		b	5	100.0					
		c	5	100.0					
		d	5	100.0					
	100	a	4	80.0	90.0	11.5	90.0	0.091	No
		b	5	100.0					
		c	5	100.0					
		d	4	80.0					
	200	a	0	0.0	0.0	0.0	0.0	0.000	Yes
		b	0	0.0					
		c	0	0.0					
		d	0	0.0					
	400	a	0	0.0	0.0	0.0	0.0	0.000	Yes
		b	0	0.0					
		c	0	0.0					
		d	0	0.0					

MYSIDS (*A. bahia*)

SAMPLE ID	CONC (% or µg/l Cu)	REP	SURVIVAL (#)	SURVIVAL (%)	MEAN SURVIVAL (%)	STD DEV	% of CONTROL[2]	P-VALUE[b]	SIG DIFF FROM CONTROL?
Scripps Control	n/a	a	9	90.0	93.3	5.8	100.0	n/a	n/a
		b	9	90.0					
		c	10	100.0					
Salt Control	n/a	a	10	100.0	100.0	0.0	107.1	0.092	No
		b	10	100.0					
		c	10	100.0					
Copper Ref. Tox.	25	a	10	100.0	100.0	0.0	107.1	0.092	No
		b	10	100.0					
		c	10	100.0					
	50	a	10	100.0	100.0	0.0	107.1	0.092	No
		b	10	100.0					
		c	10	100.0					
	100	a	10	100.0	100.0	0.0	107.1	0.092	No
		b	10	100.0					
		c	10	100.0					
	200	a	9	90.0	83.3	5.8	89.3	0.051	No
		b	8	80.0					
		c	8	80.0					
	400	a	2	20.0	6.7	11.5	7.1	0.001	Yes
		b	0	0.0					
		c	0	0.0					

MUSSELS (*M. galloprovincialis*)

SAMPLE ID	CONC (% or µg/l Cu)	REP.	# NORMAL	# ABNORMAL	NORM DEVEL (%)	MEAN NORM DEV (%)	STD DEV	% of CONTROL[2]	P-VALUE[b]	SIG DIFF FROM CONTROL?
Scripps Control	n/a	a	148	25	85.5	94.5	5.4	100.0	n/a	n/a
		b	175	5	97.2					
		c	139	10	93.3					
		d	193	4	98.0					
		e	174	3	98.3					
Brine Control	n/a	a	177	6	96.7	95.7	1.1	98.1	0.3233	No
		b	170	10	94.4					
		c	186	6	96.9					
		d	171	8	95.5					
		e	164	9	94.8					
Copper Ref. Tox.	2.9	a	167	9	94.9	95.1	0.7	100.7	0.397	No
		b	200	11	94.8					
		c	168	10	94.4					
		d	176	8	95.7					
		e	168	7	96.0					
	4.1	a	166	3	98.2	90.3	10.0	95.6	0.221	No
		b	202	7	96.7					
		c	164	17	90.6					
		d	118	43	73.3					
		e	141	11	92.8					
	5.9	a	178	9	95.2	79.0	14.3	83.7	0.036	**Yes**
		b	169	20	89.4					
		c	157	36	81.3					
		d	128	60	68.1					
		e	124	79	61.1					
	8.4	a	69	106	39.4	23.7	13.7	25.1	0.000	**Yes**
		b	56	141	28.4					
		c	58	126	31.5					
		d	12	177	6.3					
		e	24	162	12.9					
	12.0	a	1	177	0.6	1.3	1.3	1.3	0.000	**Yes**
		b	5	172	2.8					
		c	5	203	2.4					
		d	1	207	0.5					
		e	0	171	0.0					
	17.2	a	3	177	1.7	0.5	0.7	0.5	0.000	**Yes**
		b	1	167	0.6					
		c	0	191	0.0					
		d	0	175	0.0					
		e	0	199	0.0					

SUMMARY RESULTS- QA/QC

COPPER REFERENCE TOXICANT TEST

SPECIES	NOEC (µg/l)	LOEC (µg/l)	EC50 (µg/l)	95% C.L. (µg/l)
TOPSMELT	50	100	132.0	120.2-144.8
MYSIDS	200	400	265.3	232.5-302.4
MUSSELS	5.9	8.4	7.29	6.1-8.3

[a]Controls (QA/QC) correspond to all samples from SDB4

[b]Student's t-test with a one tailed distribution and two sample unequal variance

[c] p-value is significant because treatment had a significantly greater proportion normal compared to the control
n/a - t-test not used since control and treatment have same percentage survival

[1]Controls were the Bay water samples taken prior to storm (PRE) with comparable sample ID

[2]Controls were Scripps filtered seawater

WATER QUALITY

TOPSMELT (*A. affinis*)

SAMPLE ID	Effluent Concentration (% or µg/l Cu)	Rep	pH (SU)					Dissolved Oxygen (mg/l)					Temperature (°C)					Salinity (‰)				
			0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96
SUB-OF11B-SDB4-FF	12.5%	a	7.9	7.6	7.5	7.9	8.0	6.8	5.0	4.9	6.8	7.0	19.6	18.6	19.8	18.3	18.9	33.9	34.1	34.1	34.6	35.9
	25%	a	8.0	7.6	7.8	7.7	7.9	6.7	6.4	6.5	6.4	7.0	19.5	18.6	19.4	19.2	19.3	33.8	34.0	34.2	34.2	34.4
	50%	a	8.2	7.6	7.6	7.8	7.9	6.7	6.6	6.3	6.8	6.8	19.2	18.8	19.4	18.4	18.9	33.6	33.9	33.9	35.3	36.6
	100%	a	8.5	7.6	7.7	7.7	7.6	7.0	6.2	6.6	6.6	6.2	18.8	18.3	19.2	18.8	19.2	33.1	33.5	33.8	34.3	34.6
SUB-BAY11B-SDB4-DUR	100%	a	7.6	7.5	7.6	7.6	7.6	6.6	5.7	5.0	5.5	5.3	18.3	18.4	19.6	19.3	19.4	32.7	32.8	32.8	33.1	33.1
Scripps Control	0	a	7.8	7.8	7.7	7.8	7.7	6.9	5.9	5.5	6.0	6.0	19.1	18.3	19.7	19.0	19.5	33.8	34.0	34.0	34.3	34.3
Scripps Cu Ref. Tox.	50 µg/l	a	7.9	7.8	7.7	7.8	7.7	6.9	6.2	6.5	6.3	5.9	18.7	18.0	19.2	19.1	19.4	33.9	34.4	34.7	34.2	34.3
	100 µg/l	a	7.9	7.8	7.0	7.8	7.8	7.1	6.0	6.1	6.4	6.3	18.8	18.0	19.1	19.0	19.4	33.8	34.1	34.5	34.3	34.5
	200 µg/l	a	7.8	7.8	7.7	7.9	7.8	7.0	6.0	5.9	6.5	6.5	18.6	18.1	19.4	19.1	19.3	33.8	34.0	34.7	34.1	34.2
	400 µg/l	a	7.8	7.9	N	N	N	7.0	6.2	N	N	N	18.6	18.0	N	N	N	33.8	34.1	N	N	N
Salt Control	n/a	a	8.1	7.9	7.7	7.8	7.6	6.9	5.9	6.2	6.0	6.1	19.8	18.0	18.9	18.9	19.4	33.3	33.5	33.6	33.6	33.7

MYSIDS (*A. bahia*)

SAMPLE ID	Effluent Concentration (% or µg/l Cu)	Rep	pH (SU)					Dissolved Oxygen (mg/l)					Temperature (°C)					Salinity (‰)				
			0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96
SUB-OF11B-SDB4-FF	12.5%	a	7.9	7.5	7.9	7.9	7.9	6.7	3.3	6.9	6.5	7.0	19.4	18.8	19.1	19.0	19.1	34.2	34.4	34.7	34.6	34.8
	25%	a	8.0	7.6	7.8	7.7	7.7	6.7	6.4	6.5	6.5	6.7	19.4	18.7	19.3	19.3	19.3	34.2	34.3	34.3	34.3	34.8
	50%	a	8.2	7.6	7.7	7.8	7.8	6.7	6.3	6.5	6.5	6.8	19.0	18.9	19.3	19.2	19.2	34.0	34.1	34.1	34.3	34.8
	100%	a	8.5	7.3	7.6	7.7	7.7	6.9	2.7	6.0	6.6	6.5	18.8	18.6	19.3	19.3	19.3	33.5	33.7	33.8	34.2	34.5
SUB-BAY11B-SDB4-DUR	100%	a	7.6	7.6	7.6	7.5	7.5	6.6	5.3	5.0	4.7	4.8	18.3	18.3	19.6	19.6	19.6	33.1	33.3	33.3	33.2	33.3
Scripps Control	0	a	7.9	7.7	7.7	7.7	7.6	6.9	4.7	5.3	5.0	4.8	18.8	18.3	19.4	19.3	19.5	34.4	34.6	34.6	34.2	34.3
Scripps Cu Ref. Tox.	25 µg/l	a	7.9	7.7	7.7	7.8	7.6	6.9	5.4	5.7	5.4	5.2	18.8	18.6	19.4	19.3	19.6	34.3	34.4	34.6	34.3	34.3
	50 µg/l	a	7.9	7.7	7.6	7.7	7.6	7.1	5.3	5.3	5.0	4.5	18.7	18.6	19.5	19.3	19.6	34.4	34.5	34.5	34.2	34.2
	100 µg/l	a	7.9	7.7	7.6	7.7	7.7	7.1	5.7	4.9	5.6	5.1	18.6	18.5	19.4	19.3	19.6	34.2	34.4	34.5	34.3	34.3
	200 µg/l	a	7.9	7.8	7.8	7.8	7.7	7.0	5.9	6.3	6.1	5.7	18.7	18.6	19.1	19.3	19.6	34.4	34.6	34.2	34.3	34.4
	400 µg/l	a	7.9	7.8	7.6	7.9	7.8	7.0	6.1	5.5	6.4	6.1	18.7	18.6	19.4	19.3	19.6	34.3	34.5	34.6	34.2	34.2
Salt Control	n/a	a	7.9	7.8	7.6	7.9	7.8	7.0	6.1	5.5	6.4	6.1	18.7	18.6	19.4	19.3	19.6	34.3	34.5	34.6	34.2	34.2

MUSSELS (*M. galloprovincialis*)

SAMPLE ID	Effluent Concentration (% or µg/l Cu)	Rep.	pH (SU)		D.O. (mg/l)		Temp (°C)		Salinity (‰)	
			0	48	0	48	0	48	0	48
SUB-OF11B-SDB4-FF	6.25%	f	7.7	7.8	6.9	6.4	15.1	15.7	33.5	34.1
	25%	f	7.6	7.7	6.8	5.9	15.1	15.6	34.3	34.1
	61.4%	f	7.6	7.2	7.0	3.4	15.5	15.7	34.1	34.4
SUB-BAY11B-SDB4-DUR	100%	f	7.7	7.8	7.0	7.0	15.2	15.1	32.6	32.9
Scripps Control	0	f	7.8	7.6	6.9	6.8	15.6	15.7	34.0	34.2
Scripps Cu Ref. Tox.	2.9 µg/l	f	7.8	7.8	7.0	6.8	15.8	15.7	33.9	34.1
	8.4 µg/l	f	7.8	7.7	6.9	6.8	15.7	15.5	33.9	34.1
	24 µg/l	f	7.8	7.8	6.9	7.1	15.8	15.5	34.1	34.1
Brine Control	0	f	7.9	7.9	7.0	7.0	15.5	15.7	33.7	34.2

N - water quality not taken due to 100% mortality in treatment

SDB5 – 01/10/2005

BAY SAMPLES

TOPSMELT (*A. affinis*)

SAMPLE ID	CONC (%)	REP	SURVIVAL (#)	SURVIVAL (%)	MEAN SURVIVAL (%)	STD DEV	% of CONTROL[2]	P-VALUE[b]	SIG DIFF FROM CONTROL?
SUB-BAY11B-SDB5-AFT	100	a	5	100.0	100	0.0	100	n/a	No
		b	5	100.0					
		c	5	100.0					
		d	5	100.0					

MUSSELS (*M. galloprovincialis*)

SAMPLE ID	CONC (%)	REP.	# NORMAL	# ABNORMAL	NORM DEVEL (%)	MEAN NORM DEV (%)	STD DEV	% of CONTROL[2]	P-VALUE[b]	SIG DIFF FROM CONTROL?
SUB-BAY11B-SDB5-AFT	100	a	162	8	95.3	94.9	2.0	105.3	0.004	Yes[c]
		b	156	14	91.8					
		c	149	6	96.1					
		d	166	10	94.3					
		e	168	5	97.1					

QA/QC SAMPLES[a]

TOPSMELT (*A. affinis*)

SAMPLE ID	CONC (% or µg/l Cu)	REP	SURVIVAL (#)	SURVIVAL (%)	MEAN SURVIVAL (%)	STD DEV	% of CONTROL[2]	P-VALUE[b]	SIG DIFF FROM CONTROL?
Scripps Control	n/a	a	5	100.0	100.0	0.0	100.0	n/a	n/a
		b	5	100.0					
		c	5	100.0					
		d	5	100.0					
Copper Ref. Tox.	25	a	5	100.0	100	0.0	100	n/a	No
		b	5	100.0					
		c	5	100.0					
		d	5	100.0					
	50	a	4	80.0	95	10.0	95	0.196	No
		b	5	100.0					
		c	5	100.0					
		d	5	100.0					
	100	a	4	80.0	90	11.5	90	0.091	No
		b	5	100.0					
		c	5	100.0					
		d	4	80.0					
	200	a	1	20.0	15	10.0	15	0.000	Yes
		b	1	20.0					
		c	1	20.0					
		d	0	0.0					
	400	a	0	0.0	0	0.0	0	0.000	Yes
		b	0	0.0					
		c	0	0.0					
		d	0	0.0					

MUSSELS (*M. galloprovincialis*)

SAMPLE ID	CONC (% or µg/l Cu)	REP.	# NORMAL	# ABNORMAL	NORM DEVEL (%)	MEAN NORM DEV (%)	STD DEV	% of CONTROL[2]	P-VALUE[b]	SIG DIFF FROM CONTROL?
Scripps Control	n/a	a	160	4	97.6	97.7	1.0	100.0	n/a	No
		b	222	4	98.2					
		c	236	6	97.5					
		d	233	9	96.3					
		e	257	3	98.8					
Brine Control 1	n/a	a	204	3	98.6	98.4	0.8	100.7	0.119	No
		b	211	5	97.7					
		c	201	5	97.6					
		d	226	1	99.6					
		e	221	3	98.7					
Brine Control 2	n/a	a	189	3	98.4	97.8	1.1	100.1	0.440	No
		b	231	10	95.9					
		c	210	4	98.1					
		d	190	4	97.9					
		e	210	3	98.6					
Copper Ref. Tox.	2.9	a	231	5	97.9	98.6	0.7	101.0	0.057	No
		b	207	4	98.1					
		c	214	1	99.5					
		d	201	3	98.5					
		e	228	2	99.1					
	4.1	a	214	8	96.4	56.4	39.6	57.7	0.040	Yes
		b	205	21	90.7					
		c	-	-	-					
		d	-	-	-					
		e	-	-	-					
	5.9	a	125	101	55.3	49.3	10.8	50.5	0.000	Yes
		b	125	94	57.1					
		c	132	106	55.5					
		d	114	125	47.7					
		e	64	142	31.1					
	8.4	a	23	187	11.0	10.1	5.2	10.3	0.000	Yes
		b	24	173	12.2					
		c	4	210	1.9					
		d	32	170	15.8					
		e	21	200	9.5					
	12.0	a	0	195	0.0	0.3	0.2	0.3	0.000	Yes
		b	1	246	0.4					
		c	1	221	0.5					
		d	1	218	0.5					
		e	0	219	0.0					
	17.2	a	0	210	0.0	0.0	0.0	0.0	0.000	Yes
		b	0	187	0.0					
		c	0	178	0.0					
		d	0	215	0.0					
		e	0	198	0.0					

SUMMARY RESULTS- QA/QC

COPPER REFERENCE TOXICANT TEST

SPECIES	NOEC (µg/l)	LOEC (µg/l)	EC50 (µg/l)	95% C.L. (µg/l)
TOPSMELT	100	200	138.54	114.4-167.8
MUSSELS[d]	4.1	5.9	6.0	5.9-6.1

[a]Controls (QA/QC) correspond to all samples from SDB5

[b]Student's t-test with a one tailed distribution and two sample unequal variance

[c] p-value is significant because treatment had a significantly greater proportion normal compared to the control

[d] Copper reference toxicant test performed on 02/10/2005

n/a - t-test not used since control and treatment have same percentage survival

[1]Controls were the Bay water samples taken prior to storm (PRE) with comparable sample ID

[2]Controls were Scripps filtered seawater

WATER QUALITY

TOPSMELT (*A. affinis*)

SAMPLE ID	Effluent Concentration (% or µg/l Cu)	Rep	pH (SU)					Dissolved Oxygen (mg/l)					Temperature (°C)					Salinity (‰)				
			0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96
SUB-BAY11B-SDB5-AFT	100%	a	7.9	7.8	7.6	7.8	7.7	7.4	6.5	6.4	6.6	6.4	18.6	19.0	19.8	19.8	18.0	32.8	31.3	31.3	31.3	31.7
Scripps Control	0	a	7.9	7.8	7.5	7.7	7.6	7.2	6.7	6.5	6.5	6.3	19.3	19.9	19.8	19.7	18.6	31.9	31.1	29.0	29.1	29.2

MUSSELS (*M. galloprovincialis*)

SAMPLE ID	Effluent Concentration (% or µg/l Cu)	Rep.	pH (SU)			Dissolved Oxygen (mg/l)			Temperature (°C)			Salinity (‰)		
			0	24	48	0	24	48	0	24	48	0	24	48
SUB-BAY11B-SDB5-AFT	100%	f	7.8	7.8	7.9	7.4	7.7	7.5	17.1	15.8	16.1	30.9	30.7	30.7
Scripps Control	0	f	7.8	7.8	7.8	6.9	7.9	7.5	17.0	16.0	16.3	28.4	28.3	28.4

Appendix C3

NAB

SDB4- 10/17/2004
SDB5- 01/10/2005
SDB6- 2/10/2005
TIE2- 3/18/2005
SDB7- 4/27/2005

OUTFALLS

TOPSMELT (*A. affinis*)

SAMPLE ID	CONC (%)	REP	SURVIVAL (#)	SURVIVAL (%)	MEAN SURVIVAL (%)	STD DEV	% of CONTROL[1]	P-VALUE[b]	SIG DIFF FROM CONTROL?
NAB-OF9-SDB4-FF	12.5	a	5	100	95.0	10.0	95.0	0.196	No
		b	5	100					
		c	5	100					
		d	4	80					
	25	a	2	40	30.0	25.8	30.0	0.006	Yes
		b	0	0					
		c	3	60					
		d	1	20					
	50	a	0	0	5.0	10.0	5.0	0.000	Yes
		b	0	0					
		c	0	0					
		d	1	20					
	100	a	0	0	0.0	0.0	0.0	0.000	Yes
		b	0	0					
		c	0	0					
		d	0	0					

MYSIDS (*A. bahia*)

SAMPLE ID	CONC (%)	REP	SURVIVAL (#)	SURVIVAL (%)	MEAN SURVIVAL (%)	STD DEV	% of CONTROL[1]	P-VALUE[b]	SIG DIFF FROM CONTROL?
NAB-OF9-SDB4-FF	12.5	a	7	70	86.7	15.3	86.7	0.135	No
		b	10	100					
		c	9	90					
	25	a	1	10	26.7	28.9	26.7	0.024	Yes
		b	6	60					
		c	1	10					
	50	a	0	0	0.0	0.0	0.0	0.000	Yes
		b	0	0					
		c	0	0					
	100	a	0	0	0.0	0.0	0.0	0.000	Yes
		b	0	0					
		c	0	0					

MUSSELS (*M. galloprovincialis*)

SAMPLE ID	CONC (%)	REP.	# NORMAL	# ABNORMAL	NORM DEVEL (%)	MEAN NORM DEV (%)	STD DEV	% of CONTROL[1]	P-VALUE[b]	SIG DIFF FROM CONTROL?
NAB-OF9-SDB4-FF	6.25	a	1	169	0.6	3.8	2.5	3.9	0.000	Yes
		b	9	182	4.7					
		c	13	162	7.4					
		d	6	171	3.4					
		e	6	186	3.1					
	12.5	a	3	180	1.6	0.4	0.7	0.4	0.000	Yes
		b	0	187	0.0					
		c	0	182	0.0					
		d	0	189	0.0					
		e	1	184	0.5					
	25	a	0	196	0.0	0.0	0.0	0.0	0.000	Yes
		b	0	196	0.0					
		c	0	196	0.0					
		d	0	196	0.0					
		e	0	196	0.0					
	50	a	0	196	0.0	0.0	0.0	0.0	0.000	Yes
		b	0	196	0.0					
		c	0	196	0.0					
		d	0	196	0.0					
		e	0	196	0.0					
	63.5	a	0	196	0.0	0.0	0.0	0.0	0.000	Yes
		b	0	196	0.0					
		c	0	196	0.0					
		d	0	196	0.0					
		e	0	196	0.0					

[a]Controls (QA/QC) correspond to all samples from SDB4

[b]Student's t-test with a one tailed distribution and two sample unequal variance

[c] p-value is significant because treatment had a significantly greater proportion normal compared to the control
n/a - t-test not used since control and treatment have same percentage survival

[1]Controls were the Bay water samples taken prior to storm (PRE) with comparable sample ID

[2]Controls were Scripps filtered seawater

BAY SAMPLES

TOPSMELT (*A. affinis*)

SAMPLE ID	CONC (%)	REP	SURVIVAL (#)	SURVIVAL (%)	MEAN SURVIVAL (%)	STD DEV	% of CONTROL[2]	P-VALUE[b]	SIG DIFF FROM CONTROL?
NAB-BAY9-SDB4-DUR	100	a	5	100.0	95.0	10.0	95.0	0.196	No
		b	5	100.0					
		c	5	100.0					
		d	4	80.0					

MYSIDS (*A. bahia*)

SAMPLE ID	CONC (%)	REP	SURVIVAL (#)	SURVIVAL (%)	MEAN SURVIVAL (%)	STD DEV	% of CONTROL[2]	P-VALUE[b]	SIG DIFF FROM CONTROL?
NAB-BAY9-SDB4-DUR	100	a	10	100.0	100.0	0.0	100.0	n/a	No
		b	10	100.0					
		c	10	100.0					

MUSSELS (*M. galloprovincialis*)

SAMPLE ID	CONC (%)	REP.	# NORMAL	# ABNORMAL	NORM DEVEL (%)	MEAN NORM DEV (%)	STD DEV	% of CONTROL[2]	P-VALUE[b]	SIG DIFF FROM CONTROL?
NAB-BAY9-SDB4-DUR	100	a	6	207	2.8	4.0	1.9	4.1	0.0000	Yes
		b	10	185	5.1					
		c	10	162	5.8					
		d	7	139	4.8					
		e	2	150	1.3					

QA/QC SAMPLES[a]

TOPSMELT (*A. affinis*)

SAMPLE ID	CONC (% or µg/l Cu)	REP	SURVIVAL (#)	SURVIVAL (%)	MEAN SURVIVAL (%)	STD DEV	% of CONTROL[2]	P-VALUE[b]	SIG DIFF FROM CONTROL?
Scripps Control	n/a	a	5	100.0	100.0	0.0	100.0	n/a	n/a
		b	5	100.0					
		c	5	100.0					
		d	5	100.0					
Salt Control	n/a	a	5	100.0	100.0	0.0	100.0	n/a	No
		b	5	100.0					
		c	5	100.0					
		d	5	100.0					
Copper Ref. Tox.	50	a	5	100.0	100.0	0.0	100.0	n/a	No
		b	5	100.0					
		c	5	100.0					
		d	5	100.0					
	100	a	4	80.0	90.0	11.5	90.0	0.196	No
		b	5	100.0					
		c	5	100.0					
		d	4	80.0					
	200	a	0	0.0	0.0	0.0	0.0	0.000	Yes
		b	0	0.0					
		c	0	0.0					
		d	0	0.0					
	400	a	0	0.0	0.0	0.0	0.0	0.000	Yes
		b	0	0.0					
		c	0	0.0					
		d	0	0.0					

MYSIDS (*A. bahia*)

SAMPLE ID	CONC (% or µg/l Cu)	REP	SURVIVAL (#)	SURVIVAL (%)	MEAN SURVIVAL (%)	STD DEV	% of CONTROL[2]	P-VALUE[b]	SIG DIFF FROM CONTROL?
Scripps Control	n/a	a	9	90.0	93.3	5.8	100.0	n/a	n/a
		b	9	90.0					
		c	10	100.0					
Salt Control	n/a	a	10	100.0	100.0	0.0	107.1	0.092	No
		b	10	100.0					
		c	10	100.0					
Copper Ref. Tox.	25	a	10	100.0	100.0	0.0	107.1	0.092	No
		b	10	100.0					
		c	10	100.0					
	50	a	10	100.0	100.0	0.0	107.1	0.092	No
		b	10	100.0					
		c	10	100.0					
	100	a	10	100.0	100.0	0.0	107.1	0.092	No
		b	10	100.0					
		c	10	100.0					
	200	a	9	90.0	83.3	5.8	89.3	0.051	No
		b	8	80.0					
		c	8	80.0					
	400	a	2	20.0	6.7	11.5	7.1	0.001	Yes
		b	0	0.0					
		c	0	0.0					

MUSSELS (*M. galloprovincialis*)

SAMPLE ID	CONC (% or µg/l Cu)	REP.	# NORMAL	# ABNORMAL	NORM DEVEL (%)	MEAN NORM DEV (%)	STD DEV	% of CONTROL[2]	P-VALUE[b]	SIG DIFF FROM CONTROL?
Scripps Control	n/a	a	148	25	85.5	94.5	5.4	100.0	n/a	No
		b	175	5	97.2					
		c	139	10	93.3					
		d	193	4	98.0					
		e	174	3	98.3					
Brine Control	n/a	a	177	6	96.7	95.7	1.1	98.1	0.011	Yes
		b	170	10	94.4					
		c	186	6	96.9					
		d	171	8	95.5					
		e	164	9	94.8					
Copper Ref. Tox.	2.9	a	167	9	94.9	95.1	0.7	100.7	0.374	No
		b	200	11	94.8					
		c	168	10	94.4					
		d	176	8	95.7					
		e	168	7	96.0					
	4.1	a	166	3	98.2	90.3	10.0	95.6	0.308	No
		b	202	7	96.7					
		c	164	17	90.6					
		d	118	43	73.3					
		e	141	11	92.8					
	5.9	a	178	9	95.2	79.0	14.3	83.7	0.182	No
		b	169	20	89.4					
		c	157	36	81.3					
		d	128	60	68.1					
		e	124	79	61.1					
	8.4	a	69	106	39.4	23.7	13.7	25.1	0.017	Yes
		b	56	141	28.4					
		c	58	126	31.5					
		d	12	177	6.3					
		e	24	162	12.9					
	12.0	a	1	177	0.6	1.3	1.3	1.3	0.000	Yes
		b	5	172	2.8					
		c	5	203	2.4					
		d	1	207	0.5					
		e	0	171	0.0					
	17.2	a	3	177	1.7	0.5	0.7	0.5	0.000	Yes
		b	1	167	0.6					
		c	0	191	0.0					
		d	0	175	0.0					
		e	0	199	0.0					

SUMMARY RESULTS- QA/QC

COPPER REFERENCE TOXICANT TEST

SPECIES	NOEC (µg/l)	LOEC (µg/l)	EC50 (µg/l)	95% C.L. (µg/l)
TOPSMELT	50	100	132.0	120.2-144.8
MYSIDS	200	400	265.3	232.5-302.4
MUSSELS	5.9	8.4	7.29	6.1-8.3

[a]Controls (QA/QC) correspond to all samples from SDB4

[b]Student's t-test with a one tailed distribution and two sample unequal variance

[c] p-value is significant because treatment had a significantly greater proportion normal compared to the control
n/a - t-test not used since control and treatment have same percentage survival

[1]Controls were the Bay water samples taken prior to storm (PRE) with comparable sample ID

[2]Controls were Scripps filtered seawater

WATER QUALITY

TOPSMELT (*A. affinis*)

SAMPLE ID	Effluent Concentration (% or µg/l Cu)	Rep	pH (SU)					Dissolved Oxygen (mg/l)					Temperature (°C)					Salinity (‰)				
			0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96
NAB-OF9-SDB4-FF	12.5%	a	7.8	7.5	7.5	7.5	7.6	6.7	4.6	5.7	5.2	5.8	19.9	18.3	19.2	19.3	19.4	33.9	34.2	34.3	34.4	34.6
	25%	a	7.8	7.5	7.8	7.7	7.8	6.7	6.0	6.5	6.7	6.8	19.9	18.3	19.2	19.2	19.4	33.5	33.8	34.1	34.4	34.7
	50%	a	7.9	7.6	7.8	7.8	7.8	6.7	6.4	6.8	6.7	6.7	19.3	18.2	19.1	19.0	19.4	33.3	33.5	33.6	34.1	34.2
	100%	a	8.0	7.6	7.5	N	N	7.1	6.6	6.0	N	N	18.3	18.0	19.1	N	N	32.6	32.8	33.1	N	N
NAB-BAY9-SDB4-DUR	100%	a	7.7	7.6	7.5	7.7	7.7	6.9	5.7	5.6	NT	5.9	18.4	18.3	19.3	19.4	19.4	34.0	34.2	34.2	34.6	34.6
Scripps Control	0	a	7.8	7.8	7.7	7.8	7.7	6.9	5.9	5.5	6.0	6.0	19.1	18.3	19.7	19.0	19.5	33.8	34.0	34.0	34.3	34.3
Scripps Cu Ref. Tox.	50 µg/l	a	7.9	7.8	7.7	7.8	7.7	6.9	6.2	6.5	6.3	5.9	18.7	18.0	19.2	19.1	19.4	33.9	34.4	34.7	34.2	34.3
	100 µg/l	a	7.9	7.8	7.0	7.8	7.8	7.1	6.0	6.1	6.4	6.3	18.8	18.0	19.1	19.0	19.4	33.8	34.1	34.5	34.3	34.5
	200 µg/l	a	7.8	7.8	7.7	7.9	7.8	7.0	6.0	5.9	6.5	6.5	18.6	18.1	19.4	19.1	19.3	33.8	34.0	34.7	34.1	34.2
	400 µg/l	a	7.8	7.9	N	N	N	7.0	6.2	N	N	N	18.6	18.0	N	N	N	33.8	34.1	N	N	N
Salt Control	n/a	a	8.1	7.9	7.7	7.8	7.6	6.9	5.9	6.2	6.0	6.1	19.8	18.0	18.9	18.9	19.4	33.3	33.5	33.6	33.6	33.7

MYSIDS (*A. bahia*)

SAMPLE ID	Effluent Concentration (% or µg/l Cu)	Rep	pH (SU)					Dissolved Oxygen (mg/l)					Temperature (°C)					Salinity (‰)				
			0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96
NAB-OF9-SDB4-FF	12.5%	a	7.8	7.4	7.7	7.9	7.9	6.7	3.3	6.5	7.0	7.2	19.6	18.3	19.4	19.3	19.3	34.3	34.4	34.4	34.8	35.3
	25%	a	7.8	7.6	7.8	7.8	7.9	6.8	6.5	6.6	6.9	6.9	19.5	18.5	19.1	19.3	19.4	34.1	34.3	34.5	34.4	34.6
	50%	a	7.9	7.5	7.7	7.6	7.9	7.0	6.1	6.6	6.6	6.6	19.0	18.8	19.1	19.1	19.1	33.7	33.9	33.9	34.0	34.6
	100%	a	8.0	7.5	7.4	7.7	7.9	7.1	5.9	6.0	6.9	6.9	18.6	18.6	19.0	18.4	19.2	33.0	33.1	32.9	34.4	35.2
NAB-BAY9-SDB4-DUR	100%	a	7.7	7.6	7.6	7.6	7.6	6.8	5.2	5.6	5.7	5.1	18.4	18.3	19.3	19.5	19.6	34.6	34.7	34.7	34.6	34.8
Scripps Control	0	a	7.9	7.7	7.7	7.7	7.6	6.9	4.7	5.3	5.0	4.8	18.8	18.3	19.4	19.3	19.5	34.4	34.6	34.6	34.2	34.3
Scripps Cu Ref. Tox.	25 µg/l	a	7.9	7.7	7.7	7.8	7.6	6.9	5.4	5.7	5.4	5.2	18.8	18.6	19.4	19.3	19.6	34.3	34.4	34.6	34.3	34.3
	50 µg/l	a	7.9	7.7	7.6	7.7	7.6	7.1	5.3	5.3	5.0	4.5	18.7	18.6	19.5	19.3	19.6	34.4	34.5	34.5	34.2	34.2
	100 µg/l	a	7.9	7.7	7.6	7.7	7.7	7.1	5.7	4.9	5.6	5.1	18.6	18.5	19.4	19.3	19.6	34.2	34.4	34.5	34.3	34.3
	200 µg/l	a	7.9	7.8	7.8	7.8	7.7	7.0	5.9	6.3	6.1	5.7	18.7	18.6	19.1	19.3	19.6	34.4	34.6	34.2	34.3	34.4
	400 µg/l	a	7.9	7.8	7.6	7.9	7.8	7.0	6.1	5.5	6.4	6.1	18.7	18.6	19.4	19.3	19.6	34.3	34.5	34.6	34.2	34.2
Salt Control	n/a	a	7.9	7.8	7.6	7.9	7.8	7.0	6.1	5.5	6.4	6.1	18.7	18.6	19.4	19.3	19.6	34.3	34.5	34.6	34.2	34.2

MUSSELS (*M. galloprovincialis*)

SAMPLE ID	Effluent Concentration (% or µg/l Cu)	Rep.	pH (SU)		D.O. (mg/l)		Temp (°C)		Salinity (‰)	
			0	48	0	48	0	48	0	48
NAB-OF9-SDB4-FF	6.25%	f	7.7	7.7	7.0	6.6	15.7	15.4	33.9	34.1
	25%	f	7.6	7.5	7.0	4.3	15.5	15.4	34.0	34.0
	63.5%	f	7.4	7.1	7.0	1.9	15.7	15.4	33.4	34.0
NAB-BAY9-SDB4-DUR	100%	f	7.7	7.9	6.8	7.2	15.5	15.1	34.1	34.4
Scripps Control	0	f	7.8	7.6	6.9	6.8	15.6	15.7	34.0	34.2
Scripps Cu Ref. Tox.	2.9 µg/l	f	7.8	7.8	7.0	6.8	15.8	15.7	33.9	34.1
	8.4 µg/l	f	7.8	7.7	6.9	6.8	15.7	15.5	33.9	34.1
	24 µg/l	f	7.8	7.8	6.9	7.1	15.8	15.5	34.1	34.1
Brine Control	0	f	7.9	7.9	7.0	7.0	15.5	15.7	33.7	34.2

N - water quality not taken due to 100% mortality in treatment

SDB5– 01/10/2005

BAY SAMPLES

TOPSMELT (*A. affinis*)

SAMPLE ID	CONC (%)	REP	SURVIVAL (#)	SURVIVAL (%)	MEAN SURVIVAL (%)	STD DEV	% of CONTROL[2]	P-VALUE[b]	SIG DIFF FROM CONTROL?
NAB-BAY9-SDB5-AFT	100	a	5	100.0	100.0	0.0	100.0	n/a	No
		b	5	100.0					
		c	5	100.0					
		d	5	100.0					

MYSIDS (*A. bahia*)

SAMPLE ID	CONC (%)	REP	SURVIVAL (#)	SURVIVAL (%)	MEAN SURVIVAL (%)	STD DEV	% of CONTROL[2]	P-VALUE[b]	SIG DIFF FROM CONTROL?
NAB-BAY9-SDB5-AFT	100	a	9	90.0	96.7	5.8	103.6	0.259	No
		b	10	100.0					
		c	10	100.0					

MUSSELS (*M. galloprovincialis*)

SAMPLE ID	CONC (%)	REP.	# NORMAL	# ABNORMAL	NORM DEVEL (%)	MEAN NORM DEV (%)	STD DEV	% of CONTROL[2]	P-VALUE[b]	SIG DIFF FROM CONTROL?
NAB-BAY9-SDB5-AFT	100	a	107	19	84.9	90.2	4.3	100.1	0.478	No
		b	156	15	91.2					
		c	164	9	94.8					
		d	150	23	86.7					
		e	145	10	93.5					

QA/QC SAMPLES[a]

TOPSMELT (*A. affinis*)

SAMPLE ID	CONC (% or µg/l Cu)	REP	SURVIVAL (#)	SURVIVAL (%)	MEAN SURVIVAL (%)	STD DEV	% of CONTROL[2]	P-VALUE[b]	SIG DIFF FROM CONTROL?
Scripps Control	n/a	a	5	100	100.0	0.0	100.0	n/a	n/a
		b	5	100					
		c	5	100					
		d	5	100					
Copper Ref. Tox.	25	a	5	100.0	100	0.0	100	n/a	No
		b	5	100.0					
		c	5	100.0					
		d	5	100.0					
	50	a	4	80.0	95	10.0	95	0.196	No
		b	5	100.0					
		c	5	100.0					
		d	5	100.0					
	100	a	4	80.0	90	11.5	90	0.091	No
		b	5	100.0					
		c	5	100.0					
		d	4	80.0					
	200	a	1	20.0	15	10.0	15	0.000	**Yes**
		b	1	20.0					
		c	1	20.0					
		d	0	0.0					
	400	a	0	0.0	0	0.0	0	0.000	**Yes**
		b	0	0.0					
		c	0	0.0					
		d	0	0.0					

MYSIDS (*A. bahia*)

SAMPLE ID	CONC (% or µg/l Cu)	REP	SURVIVAL (#)	SURVIVAL (%)	MEAN SURVIVAL (%)	STD DEV	% of CONTROL[2]	P-VALUE[b]	SIG DIFF FROM CONTROL?
Scripps Control	n/a	a	9	90.0	93.3	5.8	100.0	n/a	n/a
		b	9	90.0					
		c	10	100.0					
Copper Ref. Tox.	50	a	10	100.0	100.0	0.0	107.1	0.092	No
		b	10	100.0					
		c	11	100.0					
	100	a	10	100.0	100.0	0.0	107.1	0.092	No
		b	10	100.0					
		c	10	100.0					
	200	a	8	80.0	90.0	10.0	96.4	0.325	No
		b	9	90.0					
		c	10	100.0					
	400	a	2	20.0	26.7	11.5	28.6	0.002	Yes
		b	2	20.0					
		c	4	40.0					

MUSSELS (*M. galloprovincialis*)

SAMPLE ID	CONC (% or µg/l Cu)	REP.	# NORMAL	# ABNORMAL	NORM DEVEL (%)	MEAN NORM DEV (%)	STD DEV	% of CONTROL[2]	P-VALUE[b]	SIG DIFF FROM CONTROL?
Scripps Control	n/a	a	160	4	97.6	97.7	1.0	100.0	n/a	No
		b	222	4	98.2					
		c	236	6	97.5					
		d	233	9	96.3					
		e	257	3	98.8					
Brine Control 1	n/a	a	204	3	98.6	98.4	0.8	100.7	0.119	No
		b	211	5	97.7					
		c	201	5	97.6					
		d	226	1	99.6					
		e	221	3	98.7					
Brine Control 2	n/a	a	189	3	98.4	97.8	1.1	100.1	0.440	No
		b	231	10	95.9					
		c	210	4	98.1					
		d	190	4	97.9					
		e	210	3	98.6					
Copper Ref. Tox.	2.9	a	231	5	97.9	98.6	0.7	101.0	0.057	No
		b	207	4	98.1					
		c	214	1	99.5					
		d	201	3	98.5					
		e	228	2	99.1					
	4.1	a	214	8	96.4	56.4	39.6	57.7	0.040	Yes
		b	205	21	90.7					
		c	-	-	-					
		d	-	-	-					
		e	-	-	-					
	5.9	a	125	101	55.3	49.3	10.8	50.5	0.000	Yes
		b	125	94	57.1					
		c	132	106	55.5					
		d	114	125	47.7					
		e	64	142	31.1					
	8.4	a	23	187	11.0	10.1	5.2	10.3	0.000	Yes
		b	24	173	12.2					
		c	4	210	1.9					
		d	32	170	15.8					
		e	21	200	9.5					
	12.0	a	0	195	0.0	0.3	0.2	0.3	0.000	Yes
		b	1	246	0.4					
		c	1	221	0.5					
		d	1	218	0.5					
		e	0	219	0.0					
	17.2	a	0	210	0.0	0.0	0.0	0.0	0.000	Yes
		b	0	187	0.0					
		c	0	178	0.0					
		d	0	215	0.0					
		e	0	198	0.0					

SUMMARY RESULTS- QA/QC

COPPER REFERENCE TOXICANT TEST

SPECIES	NOEC (µg/l)	LOEC (µg/l)	EC50 (µg/l)	95% C.L. (µg/l)
TOPSMELT	100.0	200.0	138.5	114.4-167.8
MYSIDS	200.0	400.0	324.9	276.2-379.8
MUSSELS[d]	4.1	5.9	6.0	5.9-6.1

Dash indicates no data (replicate was spilled or organisms not added)

[a]Controls (QA/QC) correspond to all samples from SDB5

[b]Student's t-test with a one tailed distribution and two sample unequal variance

[c] p-value is significant because treatment had a significantly greater proportion normal compared to the control

[d] Copper reference toxicant test performed on 02/10/2005

n/a - t-test not used since control and treatment have same percentage survival

[1]Controls were the Bay water samples taken prior to storm (PRE) with comparable sample ID

[2]Controls were Scripps filtered seawater

WATER QUALITY

TOPSMELT (*A. affinis*)

SAMPLE ID	Effluent Concentration (% or µg/l Cu)	Rep	pH (SU)					Dissolved Oxygen (mg/l)					Temperature (°C)					Salinity (‰)				
			0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96
NAB-BAY9-SDB5-AFT	100%	a	7.9	7.8	7.6	7.8	7.7	7.5	6.4	6.3	6.1	6.4	19.1	18.8	19.7	19.7	18.0	33.3	31.0	30.7	30.9	31.5
Scripps Control	0	a	7.9	7.8	7.5	7.7	7.6	7.2	6.7	6.5	6.5	6.3	19.3	19.9	19.8	19.7	18.6	31.9	31.1	29.0	29.1	29.2

MYSIDS (*A. bahia*)

SAMPLE ID	Effluent Concentration (% or µg/l Cu)	Rep	pH (SU)					Dissolved Oxygen (mg/l)					Temperature (°C)					Salinity (‰)				
			0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96
NAB-BAY9-SDB5-AFT	100%	a	7.9	7.8	7.6	7.7	7.6	7.5	6.2	4.8	5.4	5.5	19.3	18.8	19.7	19.7	18.3	33.2	31.1	30.8	31.0	31.2
Scripps Control	0	a	7.9	7.8	7.5	7.7	7.5	7.3	5.9	5.4	6.2	5.3	18.9	19.1	19.8	19.6	18.2	31.8	30.7	30.2	30.9	31.3

MUSSELS (*M. galloprovincialis*)

SAMPLE ID	Effluent Concentration (% or µg/l Cu)	Rep.	pH (SU)			Dissolved Oxygen (mg/l)			Temperature (°C)			Salinity (‰)		
			0	24	48	0	24	48	0	24	48	0	24	48
NAB-BAY9-SDB5-AFT	100%	f	7.7	7.8	7.8	7.3	7.7	7.5	17.1	16.0	16.0	28.8	28.7	28.9
Scripps Control	0	f	7.8	7.8	7.8	6.9	7.9	7.5	17.0	16.0	16.3	28.4	28.3	28.4

OUTFALLS

TOPSMELT (*A. affinis*)

SAMPLE ID	CONC (%)	REP	SURVIVAL (#)	SURVIVAL (%)	MEAN SURVIVAL (%)	STD DEV	% of CONTROL[1]	P-VALUE[b]	SIG DIFF FROM CONTROL?
NAB-OF9-SDB6-FF	12.5	a	4	80	90.0	11.5	90.0	0.091	No
		b	4	80					
		c	5	100					
		d	5	100					
	25	a	5	100	95.0	10.0	95.0	0.196	No
		b	4	80					
		c	5	100					
		d	5	100					
	50	a	5	100	95.0	10.0	95.0	0.196	No
		b	5	100					
		c	4	80					
		d	5	100					
	100	a	4	80	95.0	10.0	95.0	0.196	No
		b	5	100					
		c	5	100					
		d	5	100					
NAB-OF9-SDB6-COMP	12.5	a	5	100	100.0	0.0	100.0	n/a	No
		b	5	100					
		c	5	100					
		d	5	100					
	50	a	5	100	100.0	0.0	100.0	n/a	No
		b	5	100					
		c	5	100					
		d	5	100					
	100	a	5	100	100.0	0.0	100.0	n/a	No
		b	5	100					
		c	5	100					
		d	5	100					
NAB-OF18-SDB6-FF	12.5	a	5	100	100.0	0.0	100.0	n/a	No
		b	5	100					
		c	5	100					
		d	5	100					
	25	a	5	100	95.0	10.0	95.0	0.196	No
		b	5	100					
		c	5	100					
		d	4	80					
	50	a	5	100	95.0	10.0	95.0	0.196	No
		b	5	100					
		c	5	100					
		d	4	80					
	100	a	5	100	100.0	0.0	100.0	n/a	No
		b	5	100					
		c	5	100					
		d	5	100					

MYSIDS (*A. bahia*)

SAMPLE ID	CONC (%)	REP	SURVIVAL (#)	SURVIVAL (%)	MEAN SURVIVAL (%)	STD DEV	% of CONTROL[1]	P-VALUE[b]	SIG DIFF FROM CONTROL?
NAB-OF9-SDB6-FF	12.5	a	10	100	100.0	0.0	100.0	n/a	No
		b	10	100					
		c	10	100					
	25	a	10	100	96.7	5.8	96.7	0.211	No
		b	9	90					
		c	10	100					
	50	a	10	100	96.7	5.8	96.7	0.211	No
		b	10	100					
		c	9	90					
	100	a	8	80	90.0	10.0	90.0	0.113	No
		b	9	90					
		c	10	100					
NAB-OF9-SDB6-COMP	12.5	a	10	100	100.0	0.0	100.0	n/a	No
		b	10	100					
		c	10	100					
	50	a	10	100	96.7	5.8	96.7	0.211	No
		b	10	100					
		c	9	90					
	100	a	10	100	90.0	10.0	90.0	0.113	No
		b	9	90					
		c	8	80					
NAB-OF18-SDB6-FF	12.5	a	10	100	100.0	0.0	100.0	n/a	No
		b	10	100					
		c	10	100					
	25	a	10	100	96.7	5.8	96.7	0.211	No
		b	10	100					
		c	9	90					
	50	a	10	100	96.7	5.8	96.7	0.211	No
		b	9	90					
		c	10	100					
	100	a	9	90	86.7	5.8	86.7	0.029	Yes
		b	8	80					
		c	9	90					

MUSSELS (*M. galloprovincialis*)

SAMPLE ID	CONC (%)	REP.	# NORMAL	# ABNORMAL	NORM DEVEL (%)	MEAN NORM DEV (%)	STD DEV	% of CONTROL[1]	P-VALUE[b]	SIG DIFF FROM CONTROL?
NAB-OF9-SDB6-FF	6.2	a	180	8	96	96.9	0.8	100.5	0.217	No
		b	227	5	98					
		c	201	7	97					
		d	234	6	98					
		e	220	7	97					
	12.4	a	235	7	97	96.3	1.4	99.9	0.441	No
		b	207	13	94					
		c	202	7	97					
		d	186	8	96					
		e	209	5	98					
	24.8	a	-	-	-	68.6	17.1	71.1	0.053	No
		b	-	-	-					
		c	152	72	68					
		d	124	115	52					
		e	172	28	86					
	49.5	a	0	236	0	0.0	0.0	0.0	0.000	Yes
		b	0	209	0					
		c	0	206	0					
		d	0	213	0					
		e	0	230	0					

MUSSELS (*M. galloprovincialis*)

SAMPLE ID	CONC (%)	REP.	# NORMAL	# ABNORMAL	NORM DEVEL (%)	MEAN NORM DEV (%)	STD DEV	% of CONTROL[1]	P-VALUE[b]	SIG DIFF FROM CONTROL?
NAB-OF9-SDB6-COMP	6.4	a	220	8	96	98.4	1.2	102.0	0.016	Yes[c]
		b	215	2	99					
		c	196	2	99.0					
		d	217	5	97.7					
		e	211	1	99.5					
	12.9	a	209	2	99.1	96.5	1.9	100.1	0.471	No
		b	218	14	94.0					
		c	225	7	97.0					
		d	199	6	97.1					
		e	163	8	95.3					
	25.7	a	192	23	89.3	91.1	4.8	94.5	0.034	Yes
		b	215	14	93.9					
		c	197	39	83.5					
		d	211	13	94.2					
		e	215	12	94.7					
	51.4	a	0	228	0.0	0.0	0.0	0.0	0.000	Yes
		b	0	217	0.0					
		c	0	236	0.0					
		d	0	210	0.0					
		e	0	217	0.0					
NAB-OF18-SDB6-FF	6.2	a	187	8	95.9	96.0	1.8	98.7	0.138	No
		b	215	3	98.6					
		c	207	10	95.4					
		d	221	15	93.6					
		e	231	8	96.7					
	12.4	a	215	7	96.8	96.4	1.9	99.1	0.224	No
		b	238	2	99.2					
		c	185	12	93.9					
		d	246	10	96.1					
		e	220	9	96.1					
	24.8	a	66	138	32.4	29.7	6.4	30.5	0.000	Yes
		b	57	156	26.8					
		c	57	102	35.8					
		d	47	190	19.8					
		e	85	168	33.6					
	49.5	a	0	243	0.0	0.0	0.0	0.0	0.000	Yes
		b	0	222	0.0					
		c	0	228	0.0					
		d	0	240	0.0					
		e	0	221	0.0					

Dash indicates no data (replicate was spilled or organisms not added)

[a]Controls (QA/QC) correspond to all samples from SDB6

[b]Student's t-test with a one tailed distribution and two sample unequal variance

[c] p-value is significant because treatment had a significantly greater proportion normal compared to the control

n/a - t-test not used since control and treatment have same percentage survival

[1]Controls were the Bay water samples taken prior to storm (PRE) with comparable sample ID

[2]Controls were Scripps filtered seawater

BAY SAMPLES

TOPSMELT (*A. affinis*)

SAMPLE ID	CONC (%)	REP	SURVIVAL (#)	SURVIVAL (%)	MEAN SURVIVAL (%)	STD DEV	% of CONTROL[2]	P-VALUE[b]	SIG DIFF FROM CONTROL?
NAB-BAY9-SDB6-PRE	100	a	5	100.0	100.0	0.0	100.0	n/a	No
		b	5	100.0					
		c	5	100.0					
		d	5	100.0					
NAB-BAY18-SDB6-PRE	100	a	5	100.0	100.0	0.0	100.0	n/a	No
		b	5	100.0					
		c	5	100.0					
		d	5	100.0					
NAB-BAY9-SDB6-DUR	100	a	4	80.0	90.0	11.5	90.0	0.091	No
		b	4	80.0					
		c	5	100.0					
		d	5	100.0					
NAB-BAY18-SDB6-DUR	100	a	5	100.0	100.0	0.0	100.0	0.196	No
		b	5	100.0					
		c	5	100.0					
		d	6	100.0					