

**Draft Technical Report
for
Tentative Cleanup and Abatement
Order No. ~~R9-2011-0001~~ R9-2012-0024**

APPENDIX FOR SECTION 27

**TIER I SCREENING LEVEL RISK
ASSESSMENT FOR HUMAN HEALTH**

~~September 15, 2010~~ March 14, 2012

**SUMMARY OF TIER I HUMAN HEALTH RISK ASSESSMENT RESULTS
(RECREATIONAL ANGLER)**

	Arsenic		Cadmium		Chromium		Copper		Mercury	
	(mg/kg wet)	(mg/kg dry)	(mg/kg wet)	(mg/kg dry)	(mg/kg wet)	(mg/kg dry)	(mg/kg wet)	(mg/kg dry)	(mg/kg wet)	(mg/kg dry)
NA06										
> 95% UPL Reference Pool	--	No	--	No	--	No	--	No	--	No
> HH Tissue Residue Guideline(s)	Yes	--	No	--	No	--	No	--	No	--
NA11										
> 95% UPL Reference Pool	--	No	--	No	--	No	--	No	--	No
> HH Tissue Residue Guideline(s)	Yes	--	No	--	No	--	No	--	No	--
NA12										
> 95% UPL Reference Pool	--	No	--	No	--	No	--	No	--	No
> HH Tissue Residue Guideline(s)	Yes	--	No	--	No	--	No	--	No	--
NA20										
> 95% UPL Reference Pool	--	No	--	No	--	No	--	No	--	No
> HH Tissue Residue Guideline(s)	Yes	--	No	--	No	--	No	--	No	--
SW04										
> 95% UPL Reference Pool	--	Yes	--	No	--	No	--	Yes	--	No
> HH Tissue Residue Guideline(s)	Yes	--	No	--	No	--	No	--	No	--
SW08										
> 95% UPL Reference Pool	--	No	--	No	--	No	--	Yes	--	No
> HH Tissue Residue Guideline(s)	Yes	--	No	--	No	--	No	--	No	--
SW13										
> 95% UPL Reference Pool	--	No	--	No	--	No	--	Yes	--	No
> HH Tissue Residue Guideline(s)	Yes	--	No	--	No	--	No	--	No	--
SW21										
> 95% UPL Reference Pool	--	No	--	No	--	No	--	No	--	No
> HH Tissue Residue Guideline(s)	Yes	--	No	--	No	--	No	--	No	--
SW28										
> 95% UPL Reference Pool	--	No	--	No	--	No	--	No	--	No
> HH Tissue Residue Guideline(s)	Yes	--	No	--	No	--	No	--	No	--

**SUMMARY OF TIER I HUMAN HEALTH RISK ASSESSMENT RESULTS
(RECREATIONAL ANGLER)**

	Nickel		Selenium		Silver		Zinc		TBT	
	(mg/kg wet)	(mg/kg dry)	(mg/kg wet)	(mg/kg dry)	(mg/kg wet)	(mg/kg dry)	(mg/kg wet)	(mg/kg dry)	(ug/kg wet)	(ug/kg dry)
NA06										
> 95% UPL Reference Pool	--	No	--	No	--	No	--	Yes	--	Yes
> HH Tissue Residue Guideline(s)	No	--	No	--	No	--	No	--	No	--
NA11										
> 95% UPL Reference Pool	--	No	--	No	--	No	--	Yes	--	Yes
> HH Tissue Residue Guideline(s)	No	--	No	--	No	--	No	--	No	--
NA12										
> 95% UPL Reference Pool	--	No	--	No	--	No	--	Yes	--	Yes
> HH Tissue Residue Guideline(s)	No	--	No	--	No	--	No	--	No	--
NA20										
> 95% UPL Reference Pool	--	No	--	No	--	No	--	Yes	--	Yes
> HH Tissue Residue Guideline(s)	No	--	No	--	No	--	No	--	No	--
SW04										
> 95% UPL Reference Pool	--	No	--	No	--	No	--	Yes	--	Yes
> HH Tissue Residue Guideline(s)	No	--	No	--	No	--	No	--	No	--
SW08										
> 95% UPL Reference Pool	--	No	--	No	--	No	--	Yes	--	Yes
> HH Tissue Residue Guideline(s)	No	--	No	--	No	--	No	--	No	--
SW13										
> 95% UPL Reference Pool	--	No	--	No	--	No	--	Yes	--	Yes
> HH Tissue Residue Guideline(s)	No	--	No	--	No	--	No	--	No	--
SW21										
> 95% UPL Reference Pool	--	No	--	No	--	No	--	Yes	--	Yes
> HH Tissue Residue Guideline(s)	No	--	No	--	No	--	No	--	No	--
SW28										
> 95% UPL Reference Pool	--	No	--	No	--	No	--	Yes	--	Yes
> HH Tissue Residue Guideline(s)	No	--	No	--	No	--	No	--	No	--

**SUMMARY OF TIER I HUMAN HEALTH RISK ASSESSMENT RESULTS
(RECREATIONAL ANGLER)**

	Benzo[a]pyrene (ug/kg wet) (ug/kg dry)		Total PCBs (ng/g wet) (ng/g dry)	
NA06				
> 95% UPL Reference Pool	--	Yes	--	Yes
> HH Tissue Residue Guideline(s)	Yes	--	Yes	--
NA11				
> 95% UPL Reference Pool	--	Yes	--	No
> HH Tissue Residue Guideline(s)	Yes	--	Yes	--
NA12				
> 95% UPL Reference Pool	--	No	--	No
> HH Tissue Residue Guideline(s)	Yes	--	Yes	--
NA20				
> 95% UPL Reference Pool	--	Yes	--	No
> HH Tissue Residue Guideline(s)	Yes	--	Yes	--
SW04				
> 95% UPL Reference Pool	--	Yes	--	Yes
> HH Tissue Residue Guideline(s)	Yes	--	Yes	--
SW08				
> 95% UPL Reference Pool	--	Yes	--	Yes
> HH Tissue Residue Guideline(s)	Yes	--	Yes	--
SW13				
> 95% UPL Reference Pool	--	Yes	--	Yes
> HH Tissue Residue Guideline(s)	Yes	--	Yes	--
SW21				
> 95% UPL Reference Pool	--	Yes	--	Yes
> HH Tissue Residue Guideline(s)	Yes	--	Yes	--
SW28				
> 95% UPL Reference Pool	--	Yes	--	Yes
> HH Tissue Residue Guideline(s)	Yes	--	Yes	--

**SUMMARY OF TIER I HUMAN HEALTH RISK ASSESSMENT RESULTS
(SUBSISTENCE ANGLER)**

	Arsenic		Cadmium		Chromium		Copper		Mercury	
	(mg/kg wet)	(mg/kg dry)	(mg/kg wet)	(mg/kg dry)	(mg/kg wet)	(mg/kg dry)	(mg/kg wet)	(mg/kg dry)	(mg/kg wet)	(mg/kg dry)
NA06										
> 95% UPL Reference Pool	--	No	--	No	--	No	--	No	--	No
> HH Tissue Residue Guideline(s)	Yes	--	No	--	No	--	No	--	No	--
NA11										
> 95% UPL Reference Pool	--	No	--	No	--	No	--	No	--	No
> HH Tissue Residue Guideline(s)	Yes	--	No	--	No	--	No	--	No	--
NA12										
> 95% UPL Reference Pool	--	No	--	No	--	No	--	No	--	No
> HH Tissue Residue Guideline(s)	Yes	--	No	--	No	--	No	--	No	--
NA20										
> 95% UPL Reference Pool	--	No	--	No	--	No	--	No	--	No
> HH Tissue Residue Guideline(s)	Yes	--	No	--	No	--	No	--	No	--
SW04										
> 95% UPL Reference Pool	--	Yes	--	No	--	No	--	Yes	--	No
> HH Tissue Residue Guideline(s)	Yes	--	No	--	No	--	No	--	No	--
SW08										
> 95% UPL Reference Pool	--	No	--	No	--	No	--	Yes	--	No
> HH Tissue Residue Guideline(s)	Yes	--	No	--	No	--	No	--	No	--
SW13										
> 95% UPL Reference Pool	--	No	--	No	--	No	--	Yes	--	No
> HH Tissue Residue Guideline(s)	Yes	--	No	--	No	--	No	--	No	--
SW21										
> 95% UPL Reference Pool	--	No	--	No	--	No	--	No	--	No
> HH Tissue Residue Guideline(s)	Yes	--	No	--	No	--	No	--	No	--
SW28										
> 95% UPL Reference Pool	--	No	--	No	--	No	--	No	--	No
> HH Tissue Residue Guideline(s)	Yes	--	No	--	No	--	No	--	No	--

**SUMMARY OF TIER I HUMAN HEALTH RISK ASSESSMENT RESULTS
(SUBSISTENCE ANGLER)**

	Nickel		Selenium		Silver		Zinc		TBT	
	(mg/kg wet)	(mg/kg dry)	(mg/kg wet)	(mg/kg dry)	(mg/kg wet)	(mg/kg dry)	(mg/kg wet)	(mg/kg dry)	(ug/kg wet)	(ug/kg dry)
NA06										
> 95% UPL Reference Pool	--	No	--	No	--	No	--	Yes	--	Yes
> HH Tissue Residue Guideline(s)	No	--	No	--	No	--	No	--	No	--
NA11										
> 95% UPL Reference Pool	--	No	--	No	--	No	--	Yes	--	Yes
> HH Tissue Residue Guideline(s)	No	--	No	--	No	--	No	--	No	--
NA12										
> 95% UPL Reference Pool	--	No	--	No	--	No	--	Yes	--	Yes
> HH Tissue Residue Guideline(s)	No	--	No	--	No	--	No	--	No	--
NA20										
> 95% UPL Reference Pool	--	No	--	No	--	No	--	Yes	--	Yes
> HH Tissue Residue Guideline(s)	No	--	No	--	No	--	No	--	No	--
SW04										
> 95% UPL Reference Pool	--	No	--	No	--	No	--	Yes	--	Yes
> HH Tissue Residue Guideline(s)	No	--	No	--	No	--	No	--	Yes	--
SW08										
> 95% UPL Reference Pool	--	No	--	No	--	No	--	Yes	--	Yes
> HH Tissue Residue Guideline(s)	No	--	No	--	No	--	No	--	Yes	--
SW13										
> 95% UPL Reference Pool	--	No	--	No	--	No	--	Yes	--	Yes
> HH Tissue Residue Guideline(s)	No	--	No	--	No	--	No	--	No	--
SW21										
> 95% UPL Reference Pool	--	No	--	No	--	No	--	Yes	--	Yes
> HH Tissue Residue Guideline(s)	No	--	No	--	No	--	No	--	No	--
SW28										
> 95% UPL Reference Pool	--	No	--	No	--	No	--	Yes	--	Yes
> HH Tissue Residue Guideline(s)	No	--	No	--	No	--	No	--	No	--

**SUMMARY OF TIER I HUMAN HEALTH RISK ASSESSMENT RESULTS
(SUBSISTENCE ANGLER)**

	Benzo[a]pyrene (ug/kg wet) (ug/kg dry)		Total PCBs (ng/g wet) (ng/g dry)	
NA06				
> 95% UPL Reference Pool	--	Yes	--	Yes
> HH Tissue Residue Guideline(s)	Yes	--	Yes	--
NA11				
> 95% UPL Reference Pool	--	Yes	--	No
> HH Tissue Residue Guideline(s)	Yes	--	Yes	--
NA12				
> 95% UPL Reference Pool	--	No	--	No
> HH Tissue Residue Guideline(s)	Yes	--	Yes	--
NA20				
> 95% UPL Reference Pool	--	Yes	--	No
> HH Tissue Residue Guideline(s)	Yes	--	Yes	--
SW04				
> 95% UPL Reference Pool	--	Yes	--	Yes
> HH Tissue Residue Guideline(s)	Yes	--	Yes	--
SW08				
> 95% UPL Reference Pool	--	Yes	--	Yes
> HH Tissue Residue Guideline(s)	Yes	--	Yes	--
SW13				
> 95% UPL Reference Pool	--	Yes	--	Yes
> HH Tissue Residue Guideline(s)	Yes	--	Yes	--
SW21				
> 95% UPL Reference Pool	--	Yes	--	Yes
> HH Tissue Residue Guideline(s)	Yes	--	Yes	--
SW28				
> 95% UPL Reference Pool	--	Yes	--	Yes
> HH Tissue Residue Guideline(s)	Yes	--	Yes	--

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**COMPARISON OF SHIPYARD BIOACCUMULATION STATIONS TO RISK-BASED TISSUE SCREENING LEVELS
(RECREATIONAL ANGLER)**

	Human Health Tissue Screening Level (ug/kg wet)	Shipyards Stations with <i>Macoma nasuta</i> Tissue Data (ug/kg wet)								
		NA06	NA11	NA12	NA20	SW04	SW08	SW13	SW21	SW28
Metals										
Arsenic, inorganic (RfD)	1,000	116.8	119.2	108	112.8	143.2	110.4	113.6	123.2	123.2
Arsenic, inorganic (CSF)	22.22	116.8	119.2	108	112.8	143.2	110.4	113.6	123.2	123.2
Cadmium	3,000	40	40	30	30	40	30	30	40	40
Chromium	10,000	320	270	250	310	480	360	310	390	240
Copper	123,333	2280	1900	1860	1740	4840	3300	3660	2420	2100
Mercury, total (except for Macoma tissue)	300	20	20	20	20	20	20	10	20	20
Nickel	66,667	390	340	330	430	440	340	380	360	390
Selenium	20,000	300	280	300	220	240	200	280	280	250
Silver	16,667	40	50	30	20	30	40	40	50	40
Zinc	1,000,000	19600	16600	16200	17200	28800	15800	19200	19400	19400
Organometallic Compounds										
Tributyltin	1,000	31.6	13.8	14.76	23.6	331	148	124.6	16.4	13
Polycyclic Aromatic Hydrocarbons										
Benzo[a]pyrene	2.78	27	23	20	38	174	166	105.8	138	136
Polychlorinated Biphenyls										
Total PCB Aroclors (CSF)	16.67	77.8	46.8	31.8	32	216	160	72.2	264	226
Total PCB Aroclors (RfD)	66.67	77.8	46.8	31.8	32	216	160	72.2	264	226

NOTE: Tissue concentrations bold faced and shaded are greater than the human health tissue screening levels.

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**COMPARISON OF SHIPYARD BIOACCUMULATION STATIONS TO RISK-BASED TISSUE SCREENING LEVELS
(SUBSISTENCE ANGLER)**

	Human Health Tissue Screening Level (ug/kg wet)	Shipyards Stations with <i>Macoma nasuta</i> Tissue Data (ug/kg wet)								
		NA06	NA11	NA12	NA20	SW04	SW08	SW13	SW21	SW28
Metals										
Arsenic, inorganic (RfD)	130	116.8	119.2	108	112.8	143.2	110.4	113.6	123.2	123.2
Arsenic, inorganic (CSF)	2.90	116.8	119.2	108	112.8	143.2	110.4	113.6	123.2	123.2
Cadmium	217	40	40	30	30	40	30	30	40	40
Chromium	1,304	320	270	250	310	480	360	310	390	240
Copper	16,087	2280	1900	1860	1740	4840	3300	3660	2420	2100
Mercury, total (except for Macoma tissue)	43	20	20	20	20	20	20	10	20	20
Nickel	8,696	390	340	330	430	440	340	380	360	390
Selenium	2,174	300	280	300	220	240	200	280	280	250
Silver	2,174	40	50	30	20	30	40	40	50	40
Zinc	130,435	19600	16600	16200	17200	28800	15800	19200	19400	19400
Organometallic Compounds										
Tributyltin	130	31.6	13.8	14.76	23.6	331	148	124.6	16.4	13
Polycyclic Aromatic Hydrocarbons										
Benzo[a]pyrene	0.36	27	23	20	38	174	166	105.8	138	136
Polychlorinated Biphenyls										
Total PCB Aroclors (CSF)	2.17	77.8	46.8	31.8	32	216	160	72.2	264	226
Total PCB Aroclors (RfD)	8.70	77.8	46.8	31.8	32	216	160	72.2	264	226

NOTE: Tissue concentrations bold faced and shaded are greater than the human health tissue screening levels.

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COMPARISON OF SITE/REFERENCE MACOMA TISSUE CONCENTRATIONS

	Total Solids (decimal wet)	Arsenic (mg/kg wet)	Control	Arsenic (mg/kg dry)	Cadmium (mg/kg wet)	Control	Cadmium (mg/kg dry)	Chromium (mg/kg wet)	Control	Chromium (mg/kg dry)	Copper (mg/kg wet)	Control
NA06	0.147	3	3	20.41	0.032	0.031	0.22	0.33	0.78	2.24	2.3	1.5
NA06	0.151	2.6	3.1	17.22	0.033	0.045	0.22	0.34	0.25	2.25	2.1	1.2
NA06	0.128	2.7	2.7	21.09	0.056	0.04	0.44	0.29	0.77	2.27	2.3	0.99
NA06	0.159	3	2.8	18.87	0.037	0.034	0.23	0.38	0.35	2.39	2.4	1.2
NA06	0.167	3.3	3.2	19.76	0.051	0.037	0.31	0.25	0.19	1.50	2.3	0.97
mean	0.1504	2.92	2.96	19.47	0.0418	0.0374	0.28	0.318	0.468	2.13	2.28	1.172
max	0.167	3.3	3.2	21.09	0.056	0.045	0.4375	0.38	0.78	2.39	2.4	1.5
> 95% UPL Reference Pool	--	--	--	No	--	--	No	--	--	No	--	--
NA11	0.155	3.2	3	20.65	0.036	0.031	0.23	0.26	0.78	1.68	1.6	1.5
NA11	0.148	2.6	3.1	17.57	0.028	0.045	0.19	0.23	0.25	1.55	1.8	1.2
NA11	0.131	2.8	2.7	21.37	0.025	0.04	0.19	0.18	0.77	1.37	1.6	0.99
NA11	0.155	3.7	2.8	23.87	0.052	0.034	0.34	0.34	0.35	2.19	2.6	1.2
NA11	0.147	2.6	3.2	17.69	0.054	0.037	0.37	0.36	0.19	2.45	1.9	0.97
mean	0.1472	2.98	2.96	20.23	0.039	0.0374	0.26	0.274	0.468	1.85	1.9	1.172
max	0.155	3.7	3.2	23.87	0.054	0.045	0.3673469	0.36	0.78	2.45	2.6	1.5
> 95% UPL Reference Pool	--	--	--	No	--	--	No	--	--	No	--	--
NA12	0.14	2.8	3	20.00	0.02	0.031	0.14	0.2	0.78	1.43	1.7	1.5
NA12	0.132	2.6	3.1	19.70	0.036	0.045	0.27	0.26	0.25	1.97	2	1.2
NA12	0.152	2.6	2.7	17.11	0.031	0.04	0.20	0.26	0.77	1.71	1.5	0.99
NA12	0.147	2.9	2.8	19.73	0.035	0.034	0.24	0.32	0.35	2.18	1.7	1.2
NA12	0.142	2.6	3.2	18.31	0.028	0.037	0.20	0.19	0.19	1.34	2.4	0.97
mean	0.1426	2.7	2.96	18.97	0.03	0.0374	0.21	0.246	0.468	1.72	1.86	1.172
max	0.152	2.9	3.2	20.00	0.036	0.045	0.2727273	0.32	0.78	2.18	2.4	1.5
> 95% UPL Reference Pool	--	--	--	No	--	--	No	--	--	No	--	--
NA20	0.162	3	3	18.52	0.029	0.031	0.18	0.25	0.78	1.54	1.7	1.5
NA20	0.136	2.2	3.1	16.18	0.023	0.045	0.17	0.27	0.25	1.99	1.6	1.2
NA20	0.158	3.2	2.7	20.25	0.035	0.04	0.22	0.37	0.77	2.34	2	0.99
NA20	0.158	3.2	2.8	20.25	0.035	0.034	0.22	0.37	0.35	2.34	2	1.2
NA20	0.147	2.5	3.2	17.01	0.029	0.037	0.20	0.3	0.19	2.04	1.4	0.97
mean	0.1522	2.82	2.96	18.44	0.0302	0.0374	0.20	0.312	0.468	2.05	1.74	1.172
max	0.162	3.2	3.2	20.25	0.035	0.045	0.221519	0.37	0.78	2.34	2	1.5
> 95% UPL Reference Pool	--	--	--	No	--	--	No	--	--	No	--	--
SW04	0.146	3.8	3	26.03	0.043	0.031	0.29	0.76	0.78	5.21	8.1	1.5
SW04	0.142	3.8	3.1	26.76	0.055	0.045	0.39	0.49	0.25	3.45	5	1.2
SW04	0.152	3.1	2.7	20.39	0.037	0.04	0.24	0.53	0.77	3.49	4	0.99
SW04	0.153	3.6	2.8	23.53	0.031	0.034	0.20	0.18	0.35	1.18	2.5	1.2
SW04	0.149	3.6	3.2	24.16	0.027	0.037	0.18	0.42	0.19	2.82	4.6	0.97
mean	0.1484	3.58	2.96	24.17	0.0386	0.0374	0.26	0.476	0.468	3.23	4.84	1.172
max	0.153	3.8	3.2	26.76	0.055	0.045	0.3873239	0.76	0.78	5.21	8.1	1.5

NOTE: Shaded values indicate undetected at detection limit. Therefore, 1/2 detection limit used in this table.

COMPARISON OF SITE/REFERENCE MACOMA TISSUE CONCENTRATIONS

	Total Solids (decimal wet)	Arsenic (mg/kg wet)	Control	Arsenic (mg/kg dry)	Cadmium (mg/kg wet)	Control	Cadmium (mg/kg dry)	Chromium (mg/kg wet)	Control	Chromium (mg/kg dry)	Copper (mg/kg wet)	Control
> 95% UPL Reference Pool		--	--	Yes	--	--	No	--	--	No	--	--
SW08	0.148	2.6	3	17.57	0.022	0.031	0.15	0.33	0.78	2.23	3.2	1.5
SW08	0.12	2.8	3.1	23.33	0.029	0.045	0.24	0.35	0.25	2.92	3.2	1.2
SW08	0.148	2.8	2.7	18.92	0.035	0.04	0.24	0.53	0.77	3.58	2.6	0.99
SW08	0.157	3	2.8	19.11	0.037	0.034	0.24	0.3	0.35	1.91	3.2	1.2
SW08	0.138	2.6	3.2	18.84	0.03	0.037	0.22	0.31	0.19	2.25	4.3	0.97
mean	0.1422	2.76	2.96	19.55	0.0306	0.0374	0.22	0.364	0.468	2.58	3.3	1.172
max	0.157	3	3.2	23.33	0.037	0.045	0.2416667	0.53	0.78	3.58	4.3	1.5
> 95% UPL Reference Pool		--	--	No	--	--	No	--	--	No	--	--
SW13	0.12	2.5	3	20.83	0.032	0.031	0.27	0.26	0.78	2.17	2.5	1.5
SW13	0.158	3.6	3.1	22.78	0.045	0.045	0.28	0.31	0.25	1.96	5.6	1.2
SW13	0.163	3.1	2.7	19.02	0.031	0.04	0.19	0.3	0.77	1.84	3.1	0.99
SW13	0.14	2.1	2.8	15.00	0.025	0.034	0.18	0.41	0.35	2.93	4.2	1.2
SW13	0.151	2.9	3.2	19.21	0.027	0.037	0.18	0.29	0.19	1.92	2.9	0.97
mean	0.1464	2.84	2.96	19.37	0.032	0.0374	0.22	0.314	0.468	2.16	3.66	1.172
max	0.163	3.6	3.2	22.78	0.045	0.045	0.2848101	0.41	0.78	2.93	5.6	1.5
> 95% UPL Reference Pool		--	--	No	--	--	No	--	--	No	--	--
SW21	0.157	3.1	3	19.75	0.033	0.031	0.21	0.32	0.78	2.04	2.4	1.5
SW21	0.146	3.1	3.1	21.23	0.037	0.045	0.25	0.32	0.25	2.19	2	1.2
SW21	0.164	3.7	2.7	22.56	0.053	0.04	0.32	0.35	0.77	2.13	2.4	0.99
SW21	0.148	2.9	2.8	19.59	0.042	0.034	0.28	0.34	0.35	2.30	2.2	1.2
SW21	0.128	2.6	3.2	20.31	0.038	0.037	0.30	0.6	0.19	4.69	3.1	0.97
mean	0.1486	3.08	2.96	20.69	0.0406	0.0374	0.27	0.386	0.468	2.67	2.42	1.172
max	0.164	3.7	3.2	22.56	0.053	0.045	0.3231707	0.6	0.78	4.69	3.1	1.5
> 95% UPL Reference Pool		--	--	No	--	--	No	--	--	No	--	--
SW28	0.157	2.8	3	17.83	0.036	0.031	0.23	0.2	0.78	1.27	1.8	1.5
SW28	0.143	2.7	3.1	18.88	0.028	0.045	0.20	0.18	0.25	1.26	1.6	1.2
SW28	0.155	3.3	2.7	21.29	0.036	0.04	0.23	0.25	0.77	1.61	2.2	0.99
SW28	0.163	3.5	2.8	21.47	0.053	0.034	0.33	0.3	0.35	1.84	2.7	1.2
SW28	0.155	3.1	3.2	20.00	0.034	0.037	0.22	0.27	0.19	1.74	2.2	0.97
mean	0.1546	3.08	2.96	19.90	0.0374	0.0374	0.24	0.24	0.468	1.55	2.1	1.172
max	0.163	3.5	3.2	21.47	0.053	0.045	0.3251534	0.3	0.78	1.84	2.7	1.5
> 95% UPL Reference Pool		--	--	No	--	--	No	--	--	No	--	--

NOTE: Shaded values indicate undetected at detection limit. Therefore, 1/2 detection limit used in this table.

COMPARISON OF SITE/REFERENCE MACOMA TISSUE CONCENTRATIONS

	Copper (mg/kg dry)	Lead (mg/kg wet)	Control	Lead (mg/kg dry)	Mercury (mg/kg wet)	Control	Mercury (mg/kg dry)	Nickel (mg/kg wet)	Control	Nickel (mg/kg dry)	Selenium (mg/kg wet)	Control
NA06	15.65	0.64	0.1	4.35	0.016	0.018	0.109	0.38	0.4	2.59	0.4	0.2
NA06	13.91	0.82	0.12	5.43	0.014	0.015	0.093	0.37	0.43	2.45	0.2	0.4
NA06	17.97	0.5	0.11	3.91	0.016	0.016	0.125	0.34	0.75	2.66	0.3	0.3
NA06	15.09	0.53	0.09	3.33	0.026	0.012	0.164	0.47	0.38	2.96	0.3	0.3
NA06	13.77	0.58	0.11	3.47	0.018	0.013	0.108	0.37	0.35	2.22	0.3	0.2
mean	15.28	0.614	0.106	4.10	0.018	0.0148	0.120	0.386	0.462	2.57	0.3	0.28
max	17.97	0.82	0.12	5.43	0.026	0.018	0.164	0.47	0.75	2.96	0.4	0.4
> 95% UPL Reference Pool	No	--	--	Yes	--	--	No	--	--	No	--	--
NA11	10.32	0.37	0.1	2.39	0.012	0.018	0.077	0.39	0.4	2.52	0.3	0.2
NA11	12.16	0.28	0.12	1.89	0.014	0.015	0.095	0.27	0.43	1.82	0.2	0.4
NA11	12.21	0.3	0.11	2.29	0.017	0.016	0.130	0.28	0.75	2.14	0.3	0.3
NA11	16.77	0.53	0.09	3.42	0.018	0.012	0.116	0.39	0.38	2.52	0.4	0.3
NA11	12.93	0.48	0.11	3.27	0.016	0.013	0.109	0.36	0.35	2.45	0.2	0.2
mean	12.88	0.392	0.106	2.65	0.0154	0.0148	0.105	0.338	0.462	2.29	0.28	0.28
max	16.77	0.53	0.12	3.42	0.018	0.018	0.130	0.39	0.75	2.52	0.4	0.4
> 95% UPL Reference Pool	No	--	--	No	--	--	No	--	--	No	--	--
NA12	12.14	0.3	0.1	2.14	0.02	0.018	0.143	0.32	0.4	2.29	0.4	0.2
NA12	15.15	0.31	0.12	2.35	0.015	0.015	0.114	0.36	0.43	2.73	0.3	0.4
NA12	9.87	0.3	0.11	1.97	0.013	0.016	0.086	0.3	0.75	1.97	0.2	0.3
NA12	11.56	0.37	0.09	2.52	0.014	0.012	0.095	0.37	0.38	2.52	0.4	0.3
NA12	16.90	0.38	0.11	2.68	0.014	0.013	0.099	0.29	0.35	2.04	0.2	0.2
mean	13.13	0.332	0.106	2.33	0.0152	0.0148	0.107	0.328	0.462	2.31	0.3	0.28
max	16.90	0.38	0.12	2.68	0.02	0.018	0.143	0.37	0.75	2.73	0.4	0.4
> 95% UPL Reference Pool	No	--	--	No	--	--	No	--	--	No	--	--
NA20	10.49	0.41	0.1	2.53	0.017	0.018	0.105	0.42	0.4	2.59	0.3	0.2
NA20	11.76	0.38	0.12	2.79	0.017	0.015	0.125	0.34	0.43	2.50	0.2	0.4
NA20	12.66	0.55	0.11	3.48	0.023	0.016	0.146	0.5	0.75	3.16	0.2	0.3
NA20	12.66	0.55	0.09	3.48	0.023	0.012	0.146	0.5	0.38	3.16	0.2	0.3
NA20	9.52	0.37	0.11	2.52	0.017	0.013	0.116	0.38	0.35	2.59	0.2	0.2
mean	11.42	0.452	0.106	2.96	0.0194	0.0148	0.127	0.428	0.462	2.80	0.22	0.28
max	12.66	0.55	0.12	3.48	0.023	0.018	0.146	0.5	0.75	3.16	0.3	0.4
> 95% UPL Reference Pool	No	--	--	No	--	--	No	--	--	No	--	--
SW04	55.48	1.9	0.1	13.01	0.023	0.018	0.158	0.48	0.4	3.29	0.3	0.2
SW04	35.21	1.7	0.12	11.97	0.021	0.015	0.148	0.63	0.43	4.44	0.2	0.4
SW04	26.32	1.3	0.11	8.55	0.022	0.016	0.145	0.35	0.75	2.30	0.2	0.3
SW04	16.34	0.7	0.09	4.58	0.016	0.012	0.105	0.37	0.38	2.42	0.2	0.3
SW04	30.87	1.1	0.11	7.38	0.019	0.013	0.128	0.38	0.35	2.55	0.3	0.2
mean	32.84	1.34	0.106	9.10	0.0202	0.0148	0.136	0.442	0.462	3.00	0.24	0.28
max	55.48	1.9	0.12	13.01	0.023	0.018	0.158	0.63	0.75	4.44	0.3	0.4

NOTE: Shaded values indicate undetected at detection limit. Therefore, 1/2 detection limit used in this table.

COMPARISON OF SITE/REFERENCE MACOMA TISSUE CONCENTRATIONS

	Copper (mg/kg dry)	Lead (mg/kg wet)	Control (mg/kg dry)	Lead (mg/kg dry)	Mercury (mg/kg wet)	Control (mg/kg dry)	Mercury (mg/kg dry)	Nickel (mg/kg wet)	Control (mg/kg dry)	Nickel (mg/kg dry)	Selenium (mg/kg wet)	Control (mg/kg dry)
> 95% UPL Reference Pool	Yes	--	--	Yes	--	--	No	--	--	No	--	--
SW08	21.62	0.8	0.1	5.41	0.026	0.018	0.176	0.29	0.4	1.96	0.2	0.2
SW08	26.67	1.4	0.12	11.67	0.015	0.015	0.125	0.29	0.43	2.42	0.1	0.4
SW08	17.57	0.6	0.11	4.05	0.018	0.016	0.122	0.43	0.75	2.91	0.3	0.3
SW08	20.38	0.66	0.09	4.20	0.017	0.012	0.108	0.37	0.38	2.36	0.2	0.3
SW08	31.16	0.75	0.11	5.43	0.017	0.013	0.123	0.3	0.35	2.17	0.2	0.2
mean	23.48	0.842	0.106	6.15	0.0186	0.0148	0.131	0.336	0.462	2.36	0.2	0.28
max	31.16	1.4	0.12	11.67	0.026	0.018	0.176	0.43	0.75	2.91	0.3	0.4
> 95% UPL Reference Pool	Yes	--	--	Yes	--	--	No	--	--	No	--	--
SW13	20.83	0.35	0.1	2.92	0.013	0.018	0.108	0.35	0.4	2.92	0.2	0.2
SW13	35.44	0.4	0.12	2.53	0.014	0.015	0.089	0.44	0.43	2.78	0.5	0.4
SW13	19.02	0.43	0.11	2.64	0.018	0.016	0.110	0.41	0.75	2.52	0.3	0.3
SW13	30.00	0.35	0.09	2.50	0.013	0.012	0.093	0.34	0.38	2.43	0.2	0.3
SW13	19.21	0.33	0.11	2.19	0.016	0.013	0.106	0.34	0.35	2.25	0.2	0.2
mean	24.90	0.372	0.106	2.55	0.0148	0.0148	0.101	0.376	0.462	2.58	0.28	0.28
max	35.44	0.43	0.12	2.92	0.018	0.018	0.110	0.44	0.75	2.92	0.5	0.4
> 95% UPL Reference Pool	Yes	--	--	No	--	--	No	--	--	No	--	--
SW21	15.29	0.46	0.1	2.93	0.016	0.018	0.102	0.36	0.4	2.29	0.2	0.2
SW21	13.70	0.53	0.12	3.63	0.017	0.015	0.116	0.31	0.43	2.12	0.2	0.4
SW21	14.63	0.69	0.11	4.21	0.017	0.016	0.104	0.41	0.75	2.50	0.3	0.3
SW21	14.86	0.58	0.09	3.92	0.017	0.012	0.115	0.36	0.38	2.43	0.3	0.3
SW21	24.22	0.9	0.11	7.03	0.012	0.013	0.094	0.37	0.35	2.89	0.4	0.2
mean	16.54	0.632	0.106	4.34	0.0158	0.0148	0.106	0.362	0.462	2.45	0.28	0.28
max	24.22	0.9	0.12	7.03	0.017	0.018	0.116	0.41	0.75	2.89	0.4	0.4
> 95% UPL Reference Pool	No	--	--	Yes	--	--	No	--	--	No	--	--
SW28	11.46	0.35	0.1	2.23	0.019	0.018	0.121	0.4	0.4	2.55	0.2	0.2
SW28	11.19	0.39	0.12	2.73	0.017	0.015	0.119	0.32	0.43	2.24	0.15	0.4
SW28	14.19	0.45	0.11	2.90	0.02	0.016	0.129	0.38	0.75	2.45	0.4	0.3
SW28	16.56	0.51	0.09	3.13	0.015	0.012	0.092	0.48	0.38	2.94	0.3	0.3
SW28	14.19	0.45	0.11	2.90	0.016	0.013	0.103	0.35	0.35	2.26	0.2	0.2
mean	13.52	0.43	0.106	2.78	0.0174	0.0148	0.113	0.386	0.462	2.49	0.25	0.28
max	16.56	0.51	0.12	3.13	0.02	0.018	0.129	0.48	0.75	2.94	0.4	0.4
> 95% UPL Reference Pool	No	--	--	No	--	--	No	--	--	No	--	--

NOTE: Shaded values indicate undetected at detection limit. Therefore, 1/2 detection limit used in this table.

COMPARISON OF SITE/REFERENCE MACOMA TISSUE CONCENTRATIONS

	Selenium (mg/kg dry)	Silver (mg/kg wet)	Control (mg/kg dry)	Silver (mg/kg dry)	Zinc (mg/kg wet)	Control (mg/kg dry)	Zinc (mg/kg dry)	TBT (ug/kg wet)	Control (ug/kg dry)	TBT (ug/kg dry)	Benzo[a]pyrene (ug/kg wet)	Control (ug/kg dry)
NA06	2.72	0.038	0.027	0.259	17	16	115.65	16	0.495	108.84	27	5
NA06	1.32	0.052	0.033	0.344	18	18	119.21	32	0.5	211.92	26	2.5
NA06	2.34	0.053	0.036	0.414	21	15	164.06	31	0.5	242.19	20	2.5
NA06	1.89	0.03	0.027	0.189	18	14	113.21	38	1.4	238.99	30	5
NA06	1.80	0.026	0.041	0.156	24	17	143.71	41	0.495	245.51	32	5
mean	2.01	0.0398	0.0328	0.272	19.6	16	131.17	31.6	0.678	209.49	27	4
max	2.72	0.053	0.041	0.414	24	18	164.06	41	1.4	245.51	32	5
> 95% UPL Reference Pool	No	--	--	No	--	--	Yes	--	--	Yes	--	--
NA11	1.94	0.051	0.027	0.329	15	16	96.77	15	0.495	96.77	23	5
NA11	1.35	0.041	0.033	0.277	16	18	108.11	11	0.5	74.32	26	2.5
NA11	2.29	0.042	0.036	0.321	14	15	106.87	12	0.5	91.60	19	2.5
NA11	2.58	0.072	0.027	0.465	20	14	129.03	19	1.4	122.58	27	5
NA11	1.36	0.037	0.041	0.252	18	17	122.45	12	0.495	81.63	20	5
mean	1.90	0.0486	0.0328	0.329	16.6	16	112.65	13.8	0.678	93.38	23	4
max	2.58	0.072	0.041	0.465	20	18	129.03	19	1.4	122.58	27	5
> 95% UPL Reference Pool	No	--	--	No	--	--	Yes	--	--	Yes	--	--
NA12	2.86	0.02	0.027	0.143	12	16	85.71	18	0.495	128.57	19	5
NA12	2.27	0.031	0.033	0.235	17	18	128.79	15	0.5	113.64	19	2.5
NA12	1.32	0.027	0.036	0.178	17	15	111.84	13	0.5	85.53	21	2.5
NA12	2.72	0.031	0.027	0.211	17	14	115.65	19	1.4	129.25	23	5
NA12	1.41	0.05	0.041	0.352	18	17	126.76	8.8	0.495	61.97	18	5
mean	2.12	0.0318	0.0328	0.224	16.2	16	113.75	14.76	0.678	103.79	20	4
max	2.86	0.05	0.041	0.352	18	18	128.79	19	1.4	129.25	23	5
> 95% UPL Reference Pool	No	--	--	No	--	--	Yes	--	--	Yes	--	--
NA20	1.85	0.022	0.027	0.136	19	16	117.28	22	0.495	135.80	46	5
NA20	1.47	0.019	0.033	0.140	15	18	110.29	26	0.5	191.18	23	2.5
NA20	1.27	0.022	0.036	0.139	18	15	113.92	27	0.5	170.89	35	2.5
NA20	1.27	0.022	0.027	0.139	18	14	113.92	27	1.4	170.89	43	5
NA20	1.36	0.022	0.041	0.150	16	17	108.84	16	0.495	108.84	43	5
mean	1.44	0.0214	0.0328	0.141	17.2	16	112.85	23.6	0.678	155.52	38	4
max	1.85	0.022	0.041	0.150	19	18	117.28	27	1.4	191.18	46	5
> 95% UPL Reference Pool	No	--	--	No	--	--	Yes	--	--	Yes	--	--
SW04	2.05	0.058	0.027	0.397	46	16	315.07	330	0.495	2260.27	170	5
SW04	1.41	0.029	0.033	0.204	31	18	218.31	740	0.5	5211.27	170	2.5
SW04	1.32	0.034	0.036	0.224	27	15	177.63	420	0.5	2763.16	150	2.5
SW04	1.31	0.028	0.027	0.183	19	14	124.18	150	1.4	980.39	180	5
SW04	2.01	0.024	0.041	0.161	21	17	140.94	15	0.495	100.67	200	5
mean	1.62	0.0346	0.0328	0.234	28.8	16	195.23	331	0.678	2263.15	174	4
max	2.05	0.058	0.041	0.397	46	18	315.07	740	1.4	5211.27	200	5

NOTE: Shaded values indicate undetected at detection limit. Therefore, 1/2 detection limit used in this table.

COMPARISON OF SITE/REFERENCE MACOMA TISSUE CONCENTRATIONS

	Selenium (mg/kg dry)	Silver (mg/kg wet)	Control	Silver (mg/kg dry)	Zinc (mg/kg wet)	Control	Zinc (mg/kg dry)	TBT (ug/kg wet)	Control	TBT (ug/kg dry)	Benzo[a]pyrene (ug/kg wet)	Control
> 95% UPL Reference Pool	No	--	--	No	--	--	Yes	--	--	Yes	--	--
SW08	1.35	0.016	0.027	0.108	15	16	101.35	120	0.495	810.81	170	5
SW08	0.83	0.034	0.033	0.283	14	18	116.67	210	0.5	1750.00	140	2.5
SW08	2.03	0.019	0.036	0.128	17	15	114.86	110	0.5	743.24	180	2.5
SW08	1.27	0.041	0.027	0.261	19	14	121.02	180	1.4	1146.50	190	5
SW08	1.45	0.067	0.041	0.486	14	17	101.45	120	0.495	869.57	150	5
mean	1.39	0.0354	0.0328	0.253	15.8	16	111.07	148	0.678	1064.02	166	4
max	2.03	0.067	0.041	0.486	19	18	121.02	210	1.4	1750.00	190	5
> 95% UPL Reference Pool	No	--	--	No	--	--	Yes	--	--	Yes	--	--
SW13	1.67	0.043	0.027	0.358	17	16	141.67	120	0.495	1000.00	79	5
SW13	3.16	0.077	0.033	0.487	24	18	151.90	140	0.5	886.08	120	2.5
SW13	1.84	0.028	0.036	0.172	25	15	153.37	150	0.5	920.25	100	2.5
SW13	1.43	0.027	0.027	0.193	16	14	114.29	93	1.4	664.29	100	5
SW13	1.32	0.038	0.041	0.252	14	17	92.72	120	0.495	794.70	130	5
mean	1.88	0.0426	0.0328	0.292	19.2	16	130.79	124.6	0.678	853.06	105.8	4
max	3.16	0.077	0.041	0.487	25	18	153.37	150	1.4	1000.00	130	5
> 95% UPL Reference Pool	No	--	--	No	--	--	Yes	--	--	Yes	--	--
SW21	1.27	0.053	0.027	0.338	18	16	114.65	13	0.495	82.80	180	5
SW21	1.37	0.039	0.033	0.267	18	18	123.29	14	0.5	95.89	150	2.5
SW21	1.83	0.061	0.036	0.372	24	15	146.34	16	0.5	97.56	120	2.5
SW21	2.03	0.05	0.027	0.338	18	14	121.62	15	1.4	101.35	130	5
SW21	3.13	0.054	0.041	0.422	19	17	148.44	24	0.495	187.50	110	5
mean	1.93	0.0514	0.0328	0.347	19.4	16	130.87	16.4	0.678	113.02	138	4
max	3.13	0.061	0.041	0.422	24	18	148.44	24	1.4	187.50	180	5
> 95% UPL Reference Pool	No	--	--	No	--	--	Yes	--	--	Yes	--	--
SW28	1.27	0.028	0.027	0.178	18	16	114.65	15	0.495	95.54	140	5
SW28	1.05	0.02	0.033	0.140	15	18	104.90	10	0.5	69.93	130	2.5
SW28	2.58	0.038	0.036	0.245	22	15	141.94	16	0.5	103.23	130	2.5
SW28	1.84	0.052	0.027	0.319	25	14	153.37	11	1.4	67.48	140	5
SW28	1.29	0.039	0.041	0.252	17	17	109.68	13	0.495	83.87	140	5
mean	1.61	0.0354	0.0328	0.227	19.4	16	124.91	13	0.678	84.01	136	4
max	2.58	0.052	0.041	0.319	25	18	153.37	16	1.4	103.23	140	5
> 95% UPL Reference Pool	No	--	--	No	--	--	Yes	--	--	Yes	--	--

NOTE: Shaded values indicate undetected at detection limit. Therefore, 1/2 detection limit used in this table.

COMPARISON OF SITE/REFERENCE MACOMA TISSUE CONCENTRATIONS

	Benzo[a]pyrene (ug/kg dry)	Total PCB Congeners (ng/g wet)	Control	Total PCB Congeners (ng/g dry)
NA06	183.67	55	0.47	374.15
NA06	172.19	40.1	0.44	265.56
NA06	156.25	20.1	0.54	157.03
NA06	188.68	69.2	46	435.22
NA06	191.62	57.9	0.33	346.71
mean	178.48	48.46	9.556	315.73
max	191.62	69.2	46	435.22
> 95% UPL Reference Pool	Yes	--	--	Yes
NA11	148.39	26.9	0.47	173.55
NA11	175.68	23.8	0.44	160.81
NA11	145.04	21.6	0.54	164.89
NA11	174.19	28.1	46	181.29
NA11	136.05	26.5	0.33	180.27
mean	155.87	25.38	9.556	172.16
max	175.68	28.1	46	181.29
> 95% UPL Reference Pool	Yes	--	--	No
NA12	135.71	16.1	0.47	115.00
NA12	143.94	15.2	0.44	115.15
NA12	138.16	17.3	0.54	113.82
NA12	156.46	23.4	46	159.18
NA12	126.76	17.1	0.33	120.42
mean	140.21	17.82	9.556	124.71
max	156.46	23.4	46	159.18
> 95% UPL Reference Pool	No	--	--	No
NA20	283.95	24.5	0.47	151.23
NA20	169.12	16.9	0.44	124.26
NA20	221.52	13.2	0.54	83.54
NA20	272.15	13.2	46	83.54
NA20	292.52	21.6	0.33	146.94
mean	247.85	17.88	9.556	117.91
max	292.52	24.5	46	151.23
> 95% UPL Reference Pool	Yes	--	--	No
SW04	1164.38	195	0.47	1335.62
SW04	1197.18	161	0.44	1133.80
SW04	986.84	15	0.54	98.68
SW04	1176.47	136	46	888.89
SW04	1342.28	196	0.33	1315.44
mean	1173.43	140.6	9.556	954.49
max	1342.28	196	46	1335.62

NOTE: Shaded values indicate undetected at detection limit. Therefore, 1/2 detection limit used in this table.

COMPARISON OF SITE/REFERENCE MACOMA TISSUE CONCENTRATIONS

	Benzo[a]pyrene (ug/kg dry)	Total PCB Congeners (ng/g wet)	Control	Total PCB Congeners (ng/g dry)
> 95% UPL Reference Pool	Yes	--	--	Yes
SW08	1148.65	103	0.47	695.95
SW08	1166.67	98.2	0.44	818.33
SW08	1216.22	86.2	0.54	582.43
SW08	1210.19	135	46	859.87
SW08	1086.96	90.1	0.33	652.90
mean	1165.74	102.5	9.556	721.90
max	1216.22	135	46	859.87
> 95% UPL Reference Pool	Yes	--	--	Yes
SW13	658.33	22.9	0.47	190.83
SW13	759.49	27.9	0.44	176.58
SW13	613.50	43.2	0.54	265.03
SW13	714.29	181	46	1292.86
SW13	860.93	35.3	0.33	233.77
mean	721.31	62.06	9.556	431.82
max	860.93	181	46	1292.86
> 95% UPL Reference Pool	Yes	--	--	Yes
SW21	1146.50	143	0.47	910.83
SW21	1027.40	175	0.44	1198.63
SW21	731.71	170	0.54	1036.59
SW21	878.38	167	46	1128.38
SW21	859.38	106	0.33	828.13
mean	928.67	152.2	9.556	1020.51
max	1146.50	175	46	1198.63
> 95% UPL Reference Pool	Yes	--	--	Yes
SW28	891.72	127	0.47	808.92
SW28	909.09	120	0.44	839.16
SW28	838.71	136	0.54	877.42
SW28	858.90	104	46	638.04
SW28	903.23	121	0.33	780.65
mean	880.33	121.6	9.556	788.84
max	909.09	136	46	877.42
> 95% UPL Reference Pool	Yes	--	--	Yes

NOTE: Shaded values indicate undetected at detection limit. Therefore, 1/2 detection limit used in this table.