SEES-TR-96-01
Study No. 7N04
November 1996

St. Lazaria Island
Alaska Maritime NWR

Military Contaminants Investigations

Submitted to:

Alaska Maritime National Wildlife Refuge
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November 1996

Abstract

St. Lazaria Island, part of the Alaska Maritime National Wildlife Refuge, has over 540,000 burrow nesting Leach's and fork-tailed storm-petrels (*Oceanodroma leucorhoa* and *O. furcata,* respectively), and over 20,000 other seabirds including murres (*Uria*), puffins (*Fratercula*), and other alcids. This island, located approximately fifteen miles west of Sitka, Alaska, was used by the military during WW II as a radar communications station. It is a popular destination for tour boats and fishing vessels, and is susceptible to oil spills from small boat traffic. This combination prompted the U.S. Fish and Wildlife Service to measure metal, organochlorine, and petroleum hydrocarbon concentrations, (including aliphatics and polynuclear aromatic hydrocarbons) in soils and biota. Soil samples, an addled storm-petrel egg (species unknown), and blue mussels (*Mytilus trossulus*), were collected 25-26 July 1992 on St. Lazaria Island, Alaska. Metal concentrations in soil and mussel samples were low. Hydrocarbon residues in soil and mussel samples were indicative of both biogenic and petrogenic sources and were primarily weathered oil complexes. Organochlorines were not detected in soils or mussels and were found at trace concentrations in the petrel egg. PCBs were present only in the petrel egg.

Key words: St. Lazaria Island, contaminants in storm-petrel egg, soils, blue mussel; metals, hydrocarbons

Catalog 7040013

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Acknowledgements

I thank Ron L. Britton of the U.S. Fish and Wildlife Service (USFWS), Alaska Regional Office for assisting with sample collection. Bill Hughes of the USFWS Sitka Field Office, and Burgess Bauder of the M/V Cygnus provided logistical support. Deborah Groves patiently assisted with map preparation. Reviewers that improved the manuscript were Nevin D. Holmberg, Keith Mueller, and Everett Robinson-Wilson.

Introduction

St. Lazaria is a 23 ha two humped island approximately fifteen miles west of Sitka, Alaska, and is part of the Alaska Maritime National Wildlife Refuge. Over 560,000 breeding seabirds, primarily Leach's and fork-tailed storm-petrels (*Oceanodroma leucorhoa, O. furcata*) occur on the island (Nelson et al. 1987). Other species include common murre (*Uria aalge*), thick-billed murre (*U. lomvia*), tufted puffin (*Fratercula cirrhata*), ancient murrelet *(Synthlibor amphus antiquus*), rhinoceros auklet (*Cerorhinca monocerata*), and pigeon guillimot (*Cepphus columba*). In addition, eight passerine species nest on the island. Statistics on nesting species are found in Nelson et al. 1987.

St. Lazaria was part of the military complex in Southeast Alaska during WWII, and remnants of old buildings still remain. It primarily served as an aircraft warning station with radar equipment and limited housing.

Because of it's spectacular seabird colonies and dramatic appearance, it is a popular area for wildlife viewing by organized commercial tour boat operations from Sitka. During the 1993 summer tourist season, over 100 person visits/day were made by commercial tour boats (City and Borough of Sitka, pers. comm. 1993). Offshore sport fishing is also very popular. St. Lazaria is passed by cruise ships that enter Sitka Sound, and other commercial vessels travel through offshore waters. This combination of boat traffic makes the island vunerable to oil spills.

Prior to this effort there had not been any contaminant investigations on St. Lazaria. Because of the importance of the island to seabirds, its popularity with tour boats, vunerability to oil spills, and history of military use, our principal objective was to collect contaminant data (i.e., organochlorines, polynuclear aromatic hydrocarbons, aliphatics, and metals) from the area to determine if there had been any effects from human activities on the island. These data should be useful baseline against which to compare any future perturbations and are valuable to determine if military occupation of the island resulted in contamination.

Study Objectives

1. Do a preliminary survey of the island for any potential contaminant sources and obtain contaminants data for metals and organics from soils on St. Lazaria Island.

2. Determine if any soil contamination detected is at concentrations that could cause adverse effects to burrow-nesting seabirds.

3. Obtain metals and organics data for blue mussels.

4. Obtain contaminants data on the addled petrel egg that was opportunely found.

Study Area and Methods

St. Lazaria is a rugged volcanic island 1000 m long by 100-400 m wide with a maximum elevation of

60 m. The middle one-third of the island and the island perimeter are bare rock that are frequently wave-washed during high tides and storms. The summits and rugged cliffs at either end of the island are vegetated with old-growth Sitka spruce (*Picea sitchensis*), lush grasses, and dense brush thickets of salmonberry (*Rubus spectabilis*), wild currant (*Ribes* sp.), and elderberry (*Sambucus racemosa*). Nelson et al. 1987, furthur described the island's vegetation. In the shrub dominated habitat there is little herbaceous understory vegetation and the exposed ground is riddled with petrel burrows. Puffin burrows are located on grassy cliff areas, and murres nest on exposed rock ledges of cliffs and in a sea cave on the island's northwest side.

Sample Collection

The island was surveyed for areas of human disturbance. Soil samples were collected in triplicate at ten locations on the island, four locations on the eastern hump of the island and six locations on the western hump (Fig. 1). These sites were located in grass and brush habitat, forest habitat, and at the antenna base area. Field notes were taken at each collection location in a waterproof notebook. Soil samples were collected to a depth of approximately 20 cm. Samples were collected using a stainless steel trowel rinsed with distilled water between samples. Each sample was a composite of three subsamples collected within a one to two meter radius. Soil subsamples were added to the sample jar and mixed with the trowel. If present, surface litter was removed prior to sampling. Composite samples were put into two pre-cleaned, 4 oz. glass jars with teflon-lined lids from ESS. A third sample was put in a whirl-pac type bag for archival purposes. Samples were kept on ice in a cooler and frozen within 48 hours of collection.

Blue mussels (*Mytilus trossulus*) were collected at low tide from the mid-section of the island and put into four whirl-pac bags. One bag was kept as an archive sample. All mussels were small, (four cm or less in length). Mussel tissue was removed from the shell at the analytical laboratory. The storm-petrel egg was embryonated, rotten, and cracked at it's mid-point. It was placed in a pre-cleaned jar. All tissue samples were kept on ice and frozen within 48 hours of collection.

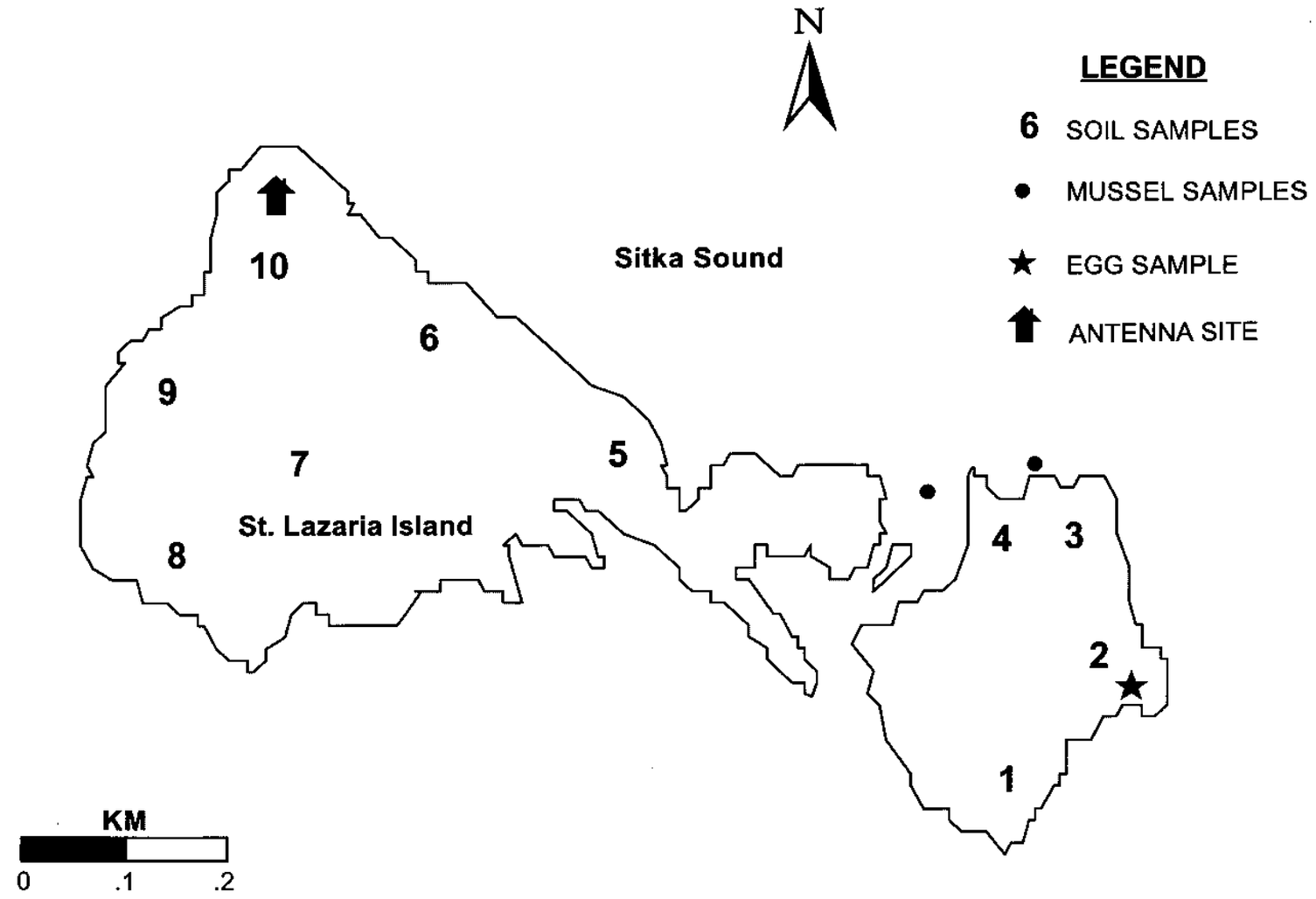
Laboratory Analyses

All samples (USFWS catalog 7040013) were sent by Federal Express overnight service to the Texas A&M Geochemical and Environmental Research Group at College Station, Texas. Samples were analyzed for a metals suite, organochlorines, and petroleum hydrocarbons.

Samples for metals analyses were weighed and homogenized. An aliquot of each sample was weighed, freeze-dried, and rehomogenized. Percent moisture was calculated for each sample and total organic carbon (TOC) was determined by the Coulometric method for soil samples. The Trace Metal Total Sediment Bomb Digest procedure was followed. This results in a total digestion with all trace elements present in the sediment or soil sample being solubilized. Analytical methods for metals included: atomic emission spectrophotometry for chromium, copper, iron, manganese, nickel, and zinc; cold vapor atomic absorption spectrometry (AAS) for mercury; and graphite furnance AAS for arsenic, selenium, cadmium, and lead. The remaining elements were determined by atomic emission using an argon plasma.

Tissue samples were extracted for organics following the NOAA Status and Trends Method (MacLeod et al.,1985) with minor revisions. Soil samples were freeze-dried, extracted, and homogenized. A 10-gram aliqot was weighed and surrogate standards and methylene chloride were added. The samples were extracted for 12 hours. Extracts were treated with copper to remove sulfur and were purified by

Fig.1 St.Lazaria Island, Alaska Maritime National Wildlife Refuge - soil and blue mussel sampling locations for inorganic and hydrocarbon analyses, July 1992.



silica/alumina column chromatography to isolate the aliphatic and aromatic/pesticide/PCB fractions. Quantitative organochlorine analyses were conducted through capillary gas chromatography (CGC) with a flame ionization detector for aliphatic hydrocarbons, CGC with electron capture detector for pesticides and PCB's, and a mass spectrometer detector in the SIM mode for aromatic hydrocarbons (Wade et al., 1988).

Percent moisture and wet and dry weight results were determined. All data are reported in parts per million (ppm) on a dry weight (DW) or wet weight (WW) basis. Residue analyses, detection limits and Quality Assurance/Quality Control (QAQC) data for metals, and QAQC data for organics are included in Appendix A.

Quality Assurance / Quality Control

Methods for sediment and biota collection followed standard protocol as described in the U. S. Fish and Wildlife Service Contaminants Handbook (1985) with minor revisions. The Quality Assurance (QA) program for residue data was conducted at the Patuxent Analytical Control Facility (PACF). Standard Reference Materials (SRM's) for metals, duplicates, spike recoveries, and procedural blanks were used to determine acceptability of laboratory data. There were six procedural blanks for metals and five for organics, two duplicates for metals and three for organics, and two spikes for metals and three spikes (two soil, one mussel tissue) per organic analyte. Limits of detection (LOD) in soil samples (5 ppm) were high for manganese, nickel, and lead, preferable limit of detection for these metals is 1.0 ppm or less.

Two times the detection limit is a standard used to interpret data reliability. Values less than twice the detection limits cannot be considered a reliable qualitative indicator of presence or absence of the analyte.

Results

The survey of the island located the remains of old building timbers and cement bags near the WWII antenna base area. These remains were found at the northern tip of the island (Fig.1) in the tallest Sitka spruce trees. Because of dense shrub understory vegetation approximately five to ten meters tall, other abandoned materials may have been overlooked. No evidence of equipment such as transformers or other electrical supplies, potential sources of polychlorinated biphenyls (PCBs) was evident. No discolored soils or obvious dumps were found. In grassy areas on cliff tops no signs of human structures or other site disturbance was found.

All soil samples collected were red-brown in color (Munsell Color Chart 2.5YR 4 / 8), appeared to be composed primarily of decayed organic material, and contained extensive fine root material and spruce needles. Total organic carbon of soil samples ranged from 43 to 54 percent. Mean moisture content was 80 percent for soils and 81 percent for blue mussels. Moisture content of the petrel egg was 66 percent.

Table 1. Metal concentrations (ppm, dry weight) in petrel egg, blue mussel, and soil samples, July 1992, St. Lazaria Island, Alaska Maritime National Wildlife Refuge.

	St. Lazaria Island AMNWR - July '92 Soil and Biota Samples METALS ANALYSES (ppm, dry weight)													
Catalog 7040013	% Moisture	Total Organic Carbon	Al	As	Cd	Cr	Cu	Fe	Hg	Mn	Ni	Pb	Se	Zn
[redacted]														
92SLe01	66.02		13.48	0.59	<.1	9.27	5.09	283.07	1.068	3.73	<2.64	0.51	5.67	56.39
[redacted]														
92SLm01	80.78		303.25	8.12	3.77	<4.02	6.2	202	<.1	5.59	<2.64	0.81	2.92	121.43
92SLm02	80.87		13	8.01	4.34	<4.02	5.77	92.3	<.1	6.42	<2.64	0.67	2.92	112.37
92SLm03	82.55		73.63	8.68	4.83	<4.02	6.1	142.04	0.1	5.69	2.77	0.89	2.82	97.56
GeoMean	81.395949		66.211	8.26487	4.29134	-	6.0205	138.353	-	5.8887	-	0.7846	2.8863	110.006
Std Dev	0.9969453		153.1	0.3593	0.5305	-	0.225	54.9293	-	0.4531	-	0.1114	0.0577	12.0499
[redacted]														
92SLs01a	84.12	47.97	<10	0.69	<.2	2.87	7.54	180	0.209	<5	<5	<5	1.39	13.8
92SLs01b	83.76	45.72	116	1.07	<.2	1.6	10.89	141	0.284	<5	<5	<5	1.01	7.6
92SLs02a	78.07	46.17	211	1.87	<.2	2.1	14.93	241	0.291	<5	<5	<5	1.89	5.9
92SLs02b	78.24	49.16	301	1.75	0.23	1.09	15.32	198	0.273	<5	<5	<5	2.57	10.1
92SLs03a	79.02	47.6	325	1.11	0.3	<1	14.85	237	0.248	6.2	<5	<5	2.43	9
92SLs03b	78.88	47.22	391	1.12	0.31	<1	11.81	328	0.251	6.3	<5	<5	1.06	5.2
92SLs04a	77.42	46.23	890	1.21	0.59	<1	8.42	866	0.277	21	<5	<5	2.17	8.4
92SLs04b	77.09	46.35	761	1.31	0.56	<1	9.2	790	0.276	11.5	<5	<5	2.02	<5
92SLs05a	79.72	45.38	1447	1.05	0.21	<1	11.96	1892	0.39	10.7	<5	<5	1.36	<5
92SLs05b	79.26	43.33	1140	0.99	<.2	<1	19.31	1622	0.408	9.7	<5	<5	2.82	10
92SLs06a	84.04	48.61	483	0.78	0.43	<1	10.62	153	0.283	5.5	<5	<5	1.41	<5
92SLs06b	83.32	53.64	796	0.56	0.41	<1	5.74	658	0.236	9.1	<5	<5	1.57	6.8
92SLs07a	78.32	53.79	301	1.37	0.62	1.08	13.84	90	0.29	<5	<5	<5	2.86	6.5
92SLs07b	77.82	48.4	294	1.49	0.59	1.31	14.48	144	0.401	8.2	<5	<5	3.36	10.2
92SLs08a	79.75	47.6	228	1	<.2	<1	8.13	65	0.254	<5	<5	<5	<1	5.5
92SLs08b	79.26	50.1	143	1.36	<.2	<1	9.81	272	0.24	5.1	<5	<5	1.54	6.7
92SLs09a	80.43	49.4	133	1.86	<.2	2.15	13.61	120	0.413	6.2	<5	<5	3.57	<5
92SLs09b	80.42	50.3	146	1.13	0.23	3.8	12.64	35	0.382	<5	<5	<5	1.22	<5
92SLs10a	78.03	49.2	165	1.1	0.87	2.57	11.95	70	0.372	12.5	<5	<5	2.47	22.9
92SLs10b	77.24	47.5	263	1.08	3.09	2.61	18.51	247	0.802	14.2	<5	<5	1.83	55.9
GeoMean	79.679165	48.1203	281.52	1.14494	0.27454	0.3126	11.667	237.683	0.31264	2.55234	-	-	1.7739	3.84937
Std Dev	2.3125777	2.553566	382.07	0.35174	0.66019	1.22	3.5403	515.935	0.12888	5.82408	-	-	0.8186	12.2596
	(Less than values calculated at one-half for geometric mean)													

Analytical Results

Metals

QA screening at PACF determined that the analytical results for all metals were acceptable. Concentrations of aluminum, arsenic, cadmium, copper, iron, mercury, manganese, nickel, lead, selenium, and zinc are reported in ppm DW (Table 1) for each soil and biota sample. All metal concentrations detected in soils were low; nickel and lead concentrations were below the detection limit of 5 ppm. Samples with concentrations below detection limits were calulated in the geometric mean at one-half of the detection limit. Mean concentrations (ppm, DW) for metals were; aluminum - 281.52, arsenic - 1.14, cadmium - 0.27, chromium - 0.31, copper - 11.67, iron - 237.20, mercury - 0.31, manganese - 2.55, selenium - 1.77, and zinc - 3.85.

Mussel tissue metal concentrations (Table 1) were within normal ranges when compared to residue data from mussels collected throughout Southeast Alaska. Mercury concentrations were at or below the detection limit of 0.1 ppm, and chromium was not detected in mussel samples. Nickel was detected just above the LOD (2.64 ppm) in one mussel sample.

Petrel egg metal concentrations for arsenic, copper, mercury, and lead were similar to those reported in eggs of seabirds and other avian species that feed in salt water (Faber and Hickey 1973, Peden et al. 1973, Ogden et al. 1974, Lande 1977). The selenium concentration was greater than concentrations reported in freshwater avian species (Olendorf and Hothem 1994), but similar to concentrations reported in white-winged scoter eggs (Henny et al. 1995). Chromium at 9.27 ppm DW was much higher than concentrations reported in other avian species' eggs (Schroeder et al 1962, Toepfer et al 1973, Blus et al. 1977, Lande 1977). Cadmium (LOD at 0.1 ppm) and nickel (LOD at 2.64 ppm) were not detected.

Organics

Organic analyses included organochlorines, aliphatic hydrocarbons, and polynuclear aromatic hydrocarbons (Table 2). The only organochlorines detected in any soil samples were p, p'-DDE and total PCBs. There were eight organochlorines detected in trace quantities in one mussel sample, and p, p'-DDE was detected in a second mussel sample (Table 3). The petrel egg contained trace amounts of the following compounds; cis-nonachlor, delta BHC, dieldrin, endrin, gamma chlordane, HCB, mirex, oxychlordane, total PCBs, trans-nonachlor, o, p'-DDD; o, p'-DDE; p, p'-DDD; p, p'-DDE; and p, p'-DDT. Concentrations of all organochlorines detected were greater than or equal to, twice their respective detection limits.

Aliphatics, associated with both petrogenic and biogenic hydrocarbons, were detected in every sample (Table 4). Pristane is a biogenic hydrocarbon that occurs in biota and sediments as a degredation product of chlorophyll. Phytane signifies the presence of oil. A pristane to phytane ratio of greater than 20:1 indicates that any hydrocarbons are from a biogenic source; a ratio of less than 20:1 indicates that hydrocarbons are probably from a petrogenic source. Only one blue mussel sample had the latter ratio indicating exposure to petrogenic oil. The Carbon Preference Index (CPI) developed by Farrington and Tripp (1977) was calculated to distinguish oiled from non-oiled samples using n-alkene carbon numbers of high molecular weight.

Table 2. Analytes for baseline contaminants study, July 1992, St. Lazaria Island, Alaska Maritime National Wildlife Refuge.

INORGANICS	POLYNUCLEAR AROMATIC HYDROCARBONS	ORGANCHLORINES	ALIPHATICS
aluminum (Al)	1,2,5,6 dibenzathracene	aldrin	n-decane C10
arsenic (As)	1,2 benzathracene	alpha BHC	n-docosane C22
cadmium (Cd)	1,6,7 trimethylnaphthalene	alpha chlordane	n-dodecane C12
chromium (Cr)	acenaphthylene	beta BHC	n-dotriacontane C32
copper (Cu)	acenaphthene	cis-nonachlor	n-eicosane C20
iron (Fe)	anthracene	delta BHC	n-heneicosane C21
lead (Pb)	benzo(a)pyrene	dieldrin	n-hentriacontane C31
manganese (Mn)	benzo(b)fluoranthene	endrin	n-heptacosane C27
mercury(Hg)	benzo(e)pyrene	gamma B	n-heptadecane C17
nickel (Ni)	benzo(g,h,i)perylene	gamma chlordane	n-hexacosane C26
selenium (Se)	benzo(k)fluoranthene	HCB	n-hexadecane C16
zinc (Zn)	biphenyl	heptachlor	n-nonoacosane C29
	C1-chrysene	mirex	n-nonadecane C19
	C1-dibenzothiophene	o,p'-DDD	n-octacosane C28
	C1-fluoranthenes & pyrenes	o,p'-DDE	n-octadecane C18
	C1-fluorenes	o,p'-DDT	n-pentacosane C25
	C1-napthalenes	oxychlordane	n-pentadecane C15
	C1- phenathrenes & anthracenes	p,p'-DDD	n-tetracosane C24
	C2-chrysene	p,p'-DDE	n-tetradecane C14
	C-2 dibenzothiophene	p,p'-DDT	n-tetratriacontane C34
	C2-fluoranthenes & pyrenes	total PCBs	n-triacontane C30
	C2-napthalenes	toxaphene	n-tricosane C23
	C2-phenanthrenes & anthracenes	transnonachlor	n-tridecane C13
	C3-chrysene		n-tritriacontane C33
	C3-dibenzothiophene		n-undecane C11
	C3-fluorenes		phytane
	C3-napthalenes		pristane
	C3-phenanthrenes & anthracenes		
	C4-chrysene		
	C4-napthalenes		
	C4-phenanthrenes & anthracenes		
	chrysene		
	dibenzothiophene		
	fluoranthene		
	fluorene		
	indeno(1,2,3-c,d)pyrene		
	naphthalene		
	perylene		
	phenanthrene		
	pyrene		
	unresolved complex mixture		

Table 3. Organochlorine analyses (ppm, wet weight) in petrel egg, blue mussel, and soil samples, July 1992, St. Lazaria Island, Alaska Maritime National Wildlife Refuge.

	St. Lazaria Is. AMNWR - July '92 Soil and Biota Samples Organics Analyses										ORGANOCHLORINES		
						(ppm, wet weight)							
sample #	% Lipid	% Moisture	Aldrin	alpha BHC	alpha chlordane	beta BHC	cis-nonachlor	delta BHC	dieldrin	endrin	gamma BHC	gamma chlordane	HCB
92SLe01	8.17	51.59	<.01727	<.0172	0.04	<.017271	0.07	0.03	0.04	0.03	<.01727	0.04	0.1
92SLm01	1.14	82.38	<.00478	<.0047	<.004782	<.004782	<.0047824	<.0047824	<.00478	<.0047	<.00478	<.0047824	<.00478
92SLm02	1.29	81.39	<.00494	<.0049	<.004943	<.004943	0.01	<.0049431	0.01	<.0049	<.00494	0.01	<.00494
92SLm03	1.07	82.94	<.00474	<.0047	<.004741	<.004741	<.0047415	<.0047415	<.00474	<.0047	<.00474	<.0047415	<.00474
mean	1.167	82.2367											
geomean	1.1631	82.2342											
std dev	0.1124	0.78488											
92SLs01a		83.95	<.00045	<.0004	<.000450	<.000450	<.0004504	<.0004504	<.00045	<.0004	<.00045	<.0004504	<.00045
92SLs01b		82.88	<.00039	<.0003	<.000399	<.000399	<.0003990	<.0003990	<.00039	<.0003	<.00039	<.0003990	<.00039
92SLs02a		77.21	<.00050	<.0005	<.000504	<.000504	<.0005042	<.0005042	<.00050	<.0005	<.00050	<.0005042	<.00050
92SLs02b		78.7	<.00177	<.0017	<.001776	<.001776	<.0017762	<.0017762	<.00177	<.0017	<.00177	<.0017762	<.00177
92SLs03a		79.82	<.00083	<.0008	<.000837	<.000837	<.0008375	<.0008375	<.00083	<.0008	<.00083	<.0008375	<.00083
92SLs03b		78.07	<.00052	<.0005	<.000529	<.000529	<.0005296	<.0005296	<.00052	<.0005	<.00052	<.0005296	<.00052
92SLs04a		78.04	<.00067	<.0006	<.000679	<.000679	<.0006798	<.0006798	<.00067	<.0006	<.00067	<.0006798	<.00067
92SLs04b		78.21	<.00043	<.0004	<.000438	<.000438	<.0004384	<.0004384	<.00043	<.0004	<.00043	<.0004384	<.00043
92SLs05a		80	<.00068	<.0006	<.000689	<.000689	<.0006896	<.0006896	<.00068	<.0006	<.00068	<.0006896	<.00068
92SLs05b		81.1	<.00075	<.0007	<.000759	<.000759	<.0007593	<.0007593	<.00075	<.0007	<.00075	<.0007593	<.00075
92SLs06a		81.86	<.00054	<.0005	<.000547	<.000547	<.0005479	<.0005479	<.00054	<.0005	<.00054	<.0005479	<.00054
92SLs06b		81.9	<.00048	<.0004	<.000480	<.000480	<.0004800	<.0004800	<.00048	<.0004	<.00048	<.0004800	<.00048
92SLs07a		78.21	<.00058	<.0005	<.000582	<.000582	<.0005827	<.0005827	<.00058	<.0005	<.00058	<.0005827	<.00058
92SLs07b		77.48	<.00206	<.0020	<.002066	<.002066	<.0020661	<.0020661	<.00206	<.0020	<.00206	<.0020661	<.00206
92SLs08a		77.67	<.00069	<.0006	<.000693	<.000693	<.0006934	<.0006934	<.00069	<.0006	<.00069	<.0006934	<.00069
92SLs08b		80.2	<.00046	<.0004	<.000463	<.000463	<.0004638	<.0004638	<.00046	<.0004	<.00046	<.0004638	<.00046
92SLs09a		81.98	<.00045	<.0004	<.000458	<.000458	<.0004585	<.0004585	<.00045	<.0004	<.00045	<.0004585	<.00045
92SLs09b		81.46	<.00039	<.0003	<.000399	<.000399	<.0003995	<.0003995	<.00039	<.0003	<.00039	<.0003995	<.00039
92SLs10a		77.14	<.00061	<.0006	<.000616	<.000616	<.0006161	<.0006161	<.00061	<.0006	<.00061	<.0006161	<.00061
92SLs10b		75.42	<.00053	<.0005	<.000539	<.000539	<.0005390	<.0005390	<.00053	<.0005	<.00053	<.0005390	<.00053
mean		79.565											
geomean		79.534											
count		20											
std dev		2.28151											

Table 3. Organochlorine analyses (ppm, wet weight) in petrel egg, blue mussel, and soil samples, July 1992, St. Lazaria Island, Alaska Maritime National Wildlife Refuge.

	St. Lazaria Is. AMNWR - July '92 Soil and Biota Samples Organics Analyses										ORGANOCHLORINES		
			(ppm, wet weight)										
sample #	Heptachlor	heptachlor epoxide	mirex	o,p'-DDD	o,p'-DDE	o,p'-DDT	oxychlor dane	p,p'-DDD	p,p'-DDE	p,p'-DDT	PCB-TOTAL	toxaphene	trans-nonachlor
92SLe01	<.01727116	0.03	0.11	0.03	0.07	<.017271	0.21	0.18	0.92	0.02	2.16	<.0172711	0.16
92SLm01	<.0047824	<.0047824	<.00478	<.004782	<.004782	<.004782	<.00478	<.004782	0.01	<.0047824	<.02391	<.0047824	<.0047824
92SLm02	<.00494315	<.0049431	0.01	<.004943	<.004943	0.01	<.00494	<.004943	0.02	<.0049431	0.1	<.0049431	0.01
92SLm03	<.00474158	<.0047415	<.00474	<.004741	<.004741	<.004741	<.00474	<.004741	<.004741	<.0047415	<.02370	<.0047415	<.0047415
mean													
geomean													
std dev*													
92SLs01a	<.00045045	<.0004504	<.00045	<.000450	<.000450	<.000450	<.00045	<.000450	<.000450	<.0004504	<.00225	<.0004504	<.0004504
92SLs01b	<.00039904	<.0003990	<.00039	<.000399	<.000399	<.000399	<.00039	<.000399	0.01	<.0003990	<.00199	<.0003990	<.0003990
92SLs02a	<.00050429	<.0005042	<.00050	<.000504	<.000504	<.000504	<.00050	<.000504	<.000504	<.0005042	<.00252	<.0005042	<.0005042
92SLs02b	<.0017762	<.0017762	<.00177	<.001776	<.001776	<.001776	<.00177	<.001776	<.001776	<.0017762	<.00888	<.0017762	<.0017762
92SLs03a	<.00083752	<.0008375	<.00083	<.000837	<.000837	<.000837	<.00083	<.000837	<.000837	<.0008375	<.00418	<.0008375	<.0008375
92SLs03b	<.00052966	<.0005296	<.00052	<.000529	<.000529	<.000529	<.00052	<.000529	<.000529	<.0005296	<.00264	<.0005296	<.0005296
92SLs04a	<.00067981	<.0006798	<.00067	<.000679	<.000679	<.000679	<.00067	<.000679	0.01	<.0006798	<.00339	<.0006798	<.0006798
92SLs04b	<.0004384	<.0004384	<.00043	<.000438	<.000438	<.000438	<.00043	<.000438	0.01	<.0004384	<.00219	<.0004384	<.0004384
92SLs05a	<.00068966	<.0006896	<.00068	<.000689	<.000689	<.000689	<.00068	<.000689	0.01	<.0006896	<.00344	<.0006896	<.0006896
92SLs05b	<.0007593	<.0007593	<.00075	<.000759	<.000759	<.000759	<.00075	<.000759	0.01	<.0007593	<.00379	<.0007593	<.0007593
92SLs06a	<.00054795	<.0005479	<.00054	<.000547	<.000547	<.000547	<.00054	<.000547	<.000547	<.0005479	<.00273	<.0005479	<.0005479
92SLs06b	<.00048008	<.0004800	<.00048	<.000480	<.000480	<.000480	<.00048	<.000480	0.01	<.0004800	<.00240	<.0004800	<.0004800
92SLs07a	<.00058275	<.0005827	<.00058	<.000582	<.000582	<.000582	<.00058	<.000582	<.000582	<.0005827	0.01	<.0005827	<.0005827
92SLs07b	<.00206612	<.0020661	<.00206	<.002066	<.002066	<.002066	<.00206	<.002066	<.002066	<.0020661	0.04	<.0020661	<.0020661
92SLs08a	<.00069348	<.0006934	<.00069	<.000693	<.000693	<.000693	<.00069	<.000693	<.000693	<.0006934	<.00346	<.0006934	<.0006934
92SLs08b	<.00046382	<.0004638	<.00046	<.000463	<.000463	<.000463	<.00046	<.000463	<.000463	<.0004638	<.00231	<.0004638	<.0004638
92SLs09a	<.00045851	<.0004585	<.00045	<.000458	<.000458	<.000458	<.00045	<.000458	<.000458	<.0004585	0.01	<.0004585	<.0004585
92SLs09b	<.00039952	<.0003995	<.00039	<.000399	<.000399	<.000399	<.00039	<.000399	<.000399	<.0003995	0.04	<.0003995	<.0003995
92SLs10a	<.00061614	<.0006161	<.00061	<.000616	<.000616	<.000616	<.00061	<.000616	<.000616	<.0006161	<.00308	<.0006161	<.0006161
92SLs10b	<.00053908	<.0005390	<.00053	<.000539	<.000539	<.000539	<.00053	<.000539	0.01	<.0005390	0.01	<.0005390	<.0005390
mean													
geomean													
count													
std dev													

Table 4. Aliphatic analyses (ppm, wet weight) in petrel egg, blue mussel, and soil samples, July 1992, St. Lazaria Island, Alaska Maritime National Wildlife Refuge.

St. Lazaria Is. AMNWR - July '92 Soil and Biota Samples Organics Analyses								ALIPHATICS					
catalog 7040013	% Moisture	n-decane	n-docosane	n-dodecane	n-dotria contane	n-eicosane	n-henei cosane	n-hentria contane	n-hepta cosane	n-hepta decane	n-hexa cosane	n-hexa decane	n-nona cosane
[illegible]													
92SLe01	51.59	0.088	0.393	0.039	0.232	0.13	13.257	0.056	0.312	0.115	1.839	0.052	15.577
[illegible]													
92SLm01	82.38	0.333	1.32	0.112	0.08	0.168	0.349	0.02	0.393	0.097	3.49	0.157	10.305
92SLm02	81.39	0.088	1.307	0.025	0.041	0.177	0.362	0.086	0.08	0.093	1.1	0.066	1.063
92SLm03	82.94	0.074	0.536	0.034	0.072	0.061	0.379	0.05	0.116	0.067	1.091	0.057	1.389
mean	82.2367	0.165	1.054333	0.057	0.064333	0.13533	0.3633333	0.052	0.19633	0.08567	1.893667	0.093333	4.25233333
geomean	82.2342	0.1294353	0.974252	0.045661	0.061811	0.12196	0.3631263	0.04414	0.15393	0.08455	1.611935	0.083902	2.4779612
std dev	0.78488	0.145661	0.448937	0.0478435	0.020599	0.06453	0.0150444	0.033045	0.17127	0.01629	1.382473	0.05532	5.24429684
[illegible]													
92SLs01a	83.95	0.009	0.01	0.004	3.138	0.004	0.026	1.589	0.717	0.005	0.041	0.004	2.39
92SLs01b	82.88	0.008	0.01	0.003	2.891	0.004	0.027	1.675	0.799	0.007	0.043	0.005	2.58
92SLs02a	77.21	0.013	0.021	0.005	2.109	0.006	0.088	1.901	0.563	0.004	0.04	0.004	2.259
92SLs02b	78.7	0.024	0.015	0.006	1.714	0.007	0.073	1.647	0.528	0.005	0.045	0.006	2.05
92SLs03a	79.82	0.013	0.023	0.004	1.053	0.012	0.123	1.282	0.6	0.008	0.053	0.005	2.113
92SLs03b	78.07	0.016	0.025	0.127	1.071	0.014	0.133	1.361	0.651	0.008	0.056	0.006	2.58
92SLs04a	78.04	0.01	0.023	0.003	2.582	0.008	0.106	2.375	0.893	0.015	0.061	0.005	3.274
92SLs04b	78.21	0.01	0.023	0.005	2.582	0.008	0.106	2.518	0.95	0.014	0.065	0.004	3.503
92SLs05a	80	0.013	0.037	0.005	10.348	0.013	0.219	3.774	1.492	0.008	0.116	0.006	5.665
92SLs05b	81.1	0.012	0.028	0.005	14.187	0.01	0.157	3.148	1.225	0.008	0.084	0.006	5.338
92SLs06a	81.86	0.009	0.018	0.003	0.976	0.008	0.045	0.677	0.346	0.007	0.036	0.004	0.966
92SLs06b	81.9	0.015	0.018	0.426	3.678	0.009	0.084	1.467	0.405	0.007	0.03	0.004	2.131
92SLs07a	78.21	0.009	0.026	0.003	3.18	0.015	0.145	1.444	0.45	0.008	0.034	0.004	3.034
92SLs07b	77.48	0.022	0.02	0.007	0.991	0.007	0.051	0.839	0.424	0.008	0.043	0.006	1.218
92SLs08a	77.67	0.014	0.018	0.005	4.59	0.046	0.085	1.428	0.412	0.006	0.029	0.005	2.185
92SLs08b	80.2	0.011	0.024	0.004	2.216	0.009	0.137	1.339	0.393	0.005	0.028	0.003	2.323
92SLs09a	81.98	0.009	0.013	0.003	12.56	0.006	0.06	1.142	0.205	0.005	0.02	0.003	0.685
92SLs09b	81.46	0.009	0.011	0.003	10.519	0.004	0.047	1.021	0.19	0.005	0.015	0.002	0.597
92SLs10a	77.14	0.009	0.011	0.005	3.383	0.007	0.038	0.438	0.101	0.008	0.011	0.004	0.356
92SLs10b	75.42	0.011	0.015	0.006	3.173	0.016	0.051	0.596	0.163	0.025	0.015	0.006	0.669
count	20	20	20	20	20	20	20	20	20	20	20	20	20
mean	79.565	0.0123	0.01945	0.0316	4.34705	0.01065	0.09005	1.58305	0.57535	0.0083	0.04325	0.0046	2.2958
geomean	79.5340	0.0117	0.0183	0.0063	3.0801	0.0088	0.0768	1.3899	0.4708	0.0075	0.0370	0.0044	1.8424
std dev	2.2815	0.0043	0.0070	0.0968	4.0592	0.0091	0.0507	0.8364	0.3586	0.0048	0.0251	0.0012	1.4270

Table 4. Aliphatic analyses (ppm, wet weight) in petrel egg, blue mussel, and soil samples, July 1992, St. Lazaria Island, Alaska Maritime National Wildlife Refuge.

		St. Lazaria Is. AMNWR - July '92 Soil and Biota Samples Organics Analyses								ALIPHATICS		
catalog 7040013	n-nona decane	n-octa cosane	n-octa decane	n-penta cosane	n-penta decane	n-tetra cosane	n-tetra decane	n-tetratria contane	n-tria contane	n-tricosane	n-tridecane	n-tritria contane
[illegible]												
92SLe01	0.311	0.163	0.02	0.289	0.217	0.151	0.055	0.031	0.104	1.628	<.01149425	0.034
[illegible]												
92SLm01	0.59	0.058	0.042	0.051	0.478	0.05	0.058	0.052	0.709	0.428	0.038	0.051
92SLm02	0.178	0.044	0.015	0.021	0.251	0.694	0.044	0.014	0.05	0.265	0.012	0.024
92SLm03	0.318	0.031	0.017	0.015	0.209	0.033	0.027	0.061	0.025	0.184	0.013	0.04
mean	0.362	0.0443333	0.024667	0.029	0.3126667	0.259	0.043	0.042333333	0.2613333	0.2923333	0.021	0.0383333
geomean	0.322033	0.0429287	0.022043	0.025232	0.2926954	0.1046199	0.040997	0.035412268	0.0960547	0.2753188	0.01809823	0.0365831
std dev	0.209495	0.0135031	0.015044	0.019287	0.1447147	0.3768169	0.015524	0.02494661	0.3878922	0.1242752	0.01473092	0.0135769
[illegible]												
92SLs01a	0.006	0.106	0.003	0.132	0.013	0.016	0.007	0.009	0.136	0.048	0.003	0.45
92SLs01b	0.007	0.114	0.003	0.142	0.014	0.017	0.007	0.009	0.144	0.051	0.003	0.43
92SLs02a	0.007	0.103	0.003	0.165	0.001	0.022	0.006	0.02	0.134	0.091	0.003	0.961
92SLs02b	0.008	0.098	0.003	0.149	0.003	0.018	0.011	0.016	0.113	0.076	<.0017762	0.845
92SLs03a	0.011	0.089	0.003	0.232	0.015	0.026	0.008	0.036	0.102	0.089	0.003	1.689
92SLs03b	0.012	0.113	0.004	0.252	0.016	0.03	0.011	0.042	0.123	0.101	0.004	1.834
92SLs04a	0.012	0.161	0.004	0.245	0.014	0.029	0.006	0.027	0.159	0.103	0.003	1.524
92SLs04b	0.012	0.16	0.003	0.258	0.012	0.027	0.009	0.026	0.167	0.104	0.003	1.516
92SLs05a	0.019	0.256	0.005	0.399	0.014	0.052	0.007	0.058	0.263	0.147	0.005	3.201
92SLs05b	0.015	0.203	0.004	0.298	0.016	0.038	0.006	0.035	0.227	0.119	0.004	2.12
92SLs06a	0.009	0.067	0.003	0.135	0.012	0.021	0.006	0.006	0.066	0.093	0.003	0.297
92SLs06b	0.008	0.089	0.003	0.116	0.01	0.017	0.006	0.025	0.124	0.08	0.003	1.153
92SLs07a	0.016	0.097	0.004	0.171	0.011	0.019	0.006	0.045	0.137	0.119	0.001	1.819
92SLs07b	0.011	0.079	0.004	0.156	0.077	0.023	0.009	0.005	0.077	0.096	<.00206612	0.335
92SLs08a	0.009	0.087	0.003	0.113	0.01	0.017	0.009	0.025	0.134	0.081	0.003	1.178
92SLs08b	0.012	0.086	0.003	0.146	0.01	0.017	0.005	0.041	0.114	0.135	0.002	1.687
92SLs09a	0.007	0.046	0.002	0.087	0.007	0.011	0.005	0.016	0.107	0.053	0.002	0.897
92SLs09b	0.006	0.04	0.002	0.072	0.005	0.01	0.004	0.013	0.086	0.048	0.002	0.738
92SLs10a	0.009	0.025	0.003	0.065	0.009	0.008	0.007	0.01	0.042	0.067	0.002	0.326
92SLs10b	0.017	0.038	0.005	0.07	0.008	0.011	0.01	0.01	0.056	0.091	0.003	0.419
count	20	20	20	20	20	20	20	20	20	20	18	20
mean	0.01065	0.10285	0.00335	0.17015	0.01385	0.02145	0.00725	0.0237	0.12555	0.0896	0.00288889	1.17095
geomean	0.0101	0.0890	0.0033	0.1513	0.0101	0.0194	0.0070	0.0191	0.1152	0.0853	0.0027	0.9394
std dev	0.0038	0.0565	0.0008	0.0862	0.0154	0.0104	0.0020	0.0150	0.0529	0.0279	0.0009	0.7569

Table 4. Aliphatic analyses (ppm, wet weight) in petrel egg, blue mussel, and soil samples, July 1992, St. Lazaria Island, Alaska Maritime National Wildlife Refuge.

St. Lazaria Is. AMNWR - July '92 Soil and Biota Samples Organics Analyses							
catalog 7040013	n-undecane	phytane	pristane				
[redacted]							
92SLe01	0.017	<.01149425	22.783				
[redacted]							
92SLm01	0.469	0.118	0.147				
92SLm02	0.045	<.00625	0.108				
92SLm03	0.016	<.00625	0.098				
mean	0.176666667	0.118	0.11766667				
geomean	0.069636208	0.118	0.11587482				
std dev	0.253582991		0.0258908				
[redacted]							
92SLs01a	0.007	0.001	0.042				
92SLs01b	0.005	0.001	0.078				
92SLs02a	0.01	0.001	0.096				
92SLs02b	0.005	0.002	0.087				
92SLs03a	0.009	0.001	0.072				
92SLs03b	0.01	0.001	0.081				
92SLs04a	0.006	0.001	0.044				
92SLs04b	0.008	0.001	0.052				
92SLs05a	0.005	0.002	0.067				
92SLs05b	0.009	0.002	0.11				
92SLs06a	0.006	0.001	0.028				
92SLs06b	0.012	0.001	0.109				
92SLs07a	0.004	0.001	0.187				
92SLs07b	0.018	<.00206612	0.036				
92SLs08a	0.008	0.002	0.109				
92SLs08b	0.008	0.001	0.113				
92SLs09a	0.005	0.001	0.183				
92SLs09b	0.005	<.00034447	0.124				
92SLs10a	0.008	0.002	0.089				
92SLs10b	0.008	0.001	0.164				
count	20	18	20				
mean	0.0078	0.00127778	0.09355				
geomean	0.0073	0.0012	0.0827				
std dev	0.0032	0.0005	0.0458				

Table 5. Polynuclear Aromatic Hydrocarbon analyses (ppm,wet weight) in petrel egg, blue mussel, and soil samples, July 1992, St. Lazaria Island, Alaska Maritime National Wildlife Refuge.

	St. Lazaria Is. AMNWR - July '92 Soil and Biota Samples Organics Analyses								Polynuclear Aromatic Hydrocarbons			
catalog 7040013	% Moisture	1,2,5,6-dibenz anthracene	1,2-benzan thracene	1,6,7-Trimethyl-naphthalene	acenaph thalene	acenaph thene	anthracene	benzo(a) pyrene	benzo(b) fluoranthene	benzo(e) pyrene	benzo (g,h,i) perylene	benzo(k) fluoran thene
[redacted]												
92SLe01	51.59	<.01149425	<.011494	0.01559	<.01149	0.0128	<.0114942	<.011494	<.01149425	<.011494	<.0114942	<.011494
[redacted]												
92SLm01	82.38	<.01960784	<.019607	<.01960784	<.01960	<.01960	<.0196078	<.019607	<.01960784	<.019607	<.0196078	<.019607
92SLm02	81.39	<.00625	<.00625	0.00699	<.00625	<.00625	<.00625	<.00625	<.00625	<.00625	<.00625	<.00625
92SLm03	82.94	<.00625	<.00625	0.00664	<.00625	<.00625	<.00625	<.00625	<.00625	<.00625	<.00625	<.00625
mean	82.2367											
geomean	82.2342											
stnd dev	1.09602											
[redacted]												
92SLs01a	83.95	0.00118	<.000450	0.00423	<.00045	0.0005	<.0004504	<.000450	0.00093	0.00078	0.00062	0.00093
92SLs01b	82.88	0.00114	<.000399	0.00438	<.00039	0.0005	<.0003990	<.000399	0.0008	0.00044	0.00059	0.0008
92SLs02a	77.21	0.00108	<.000504	0.00405	<.00050	0.0006	<.0005042	<.000504	0.00053	0.00059	0.00067	0.00053
92SLs02b	78.7	0.0031	<.001776	0.0065	0.0025	0.0023	<.0017762	<.001776	<.0017762	<.001776	<.0017762	<.001776
92SLs03a	79.82	<.00083752	<.000837	0.00243	<.00083	0.0011	<.0008375	<.000837	0.00085	0.00093	<.0008375	<.000837
92SLs03b	78.07	0.00072	<.000529	0.00274	0.00056	0.0007	<.0005296	<.000529	0.00075	0.0007	0.00252	0.00075
92SLs04a	78.04	0.00139	0.00091	0.00448	<.00067	0.0009	0.00084	<.000679	0.00099	0.00076	<.0006798	0.00099
92SLs04b	78.21	0.0008	<.000438	0.00396	<.00043	0.0015	<.0004384	<.000438	0.00052	<.000438	<.0004384	0.00052
92SLs05a	80	0.00124	<.000689	0.00379	<.00068	0.0014	<.0006896	0.00178	0.00108	0.00077	<.0006896	0.00108
92SLs05b	81.1	0.00096	<.000759	0.00652	0.00093	0.0009	0.00088	<.000759	0.00133	0.00112	0.00079	0.00133
92SLs06a	81.86	0.00117	<.000547	0.00523	<.00054	0.0011	0.00064	<.000547	0.00086	0.00078	0.00055	0.00086
92SLs06b	81.9	0.00069	<.000480	0.00346	0.00058	0.0008	<.0004800	<.000480	0.00056	0.00065	<.0004800	0.00056
92SLs07a	78.21	<.00058275	<.000582	0.00117	<.00058	<.00058	<.0005827	<.000582	<.00058275	<.000582	<.0005827	<.000582
92SLs07b	77.48	<.00206612	<.002066	<.00206612	<.00206	<.00206	<.0020661	<.002066	<.00206612	<.002066	<.0020661	<.002066
92SLs08a	77.67	<.00069348	<.000693	0.00172	<.00069	<.00069	<.0006934	<.000693	<.00069348	<.000693	<.0006934	<.000693
92SLs08b	80.2	<.00046382	<.000463	0.00094	<.00046	<.00046	<.0004638	<.000463	<.00046382	<.000463	<.0004638	<.000463
92SLs09a	81.98	<.00045851	<.000458	0.00068	<.00045	<.00045	<.0004585	<.000458	<.00045851	<.000458	<.0004585	<.000458
92SLs09b	81.46	0.00058	0.00207	0.00055	<.00034	<.00034	<.0003444	0.0016	0.00181	0.00151	0.0013	0.00181
92SLs10a	77.14	<.00061614	<.000616	0.00096	<.00061	<.00061	<.0006161	<.000616	<.00061614	<.000616	<.0006161	<.000616
92SLs10b	75.42	<.00053908	<.000539	0.0011	<.00053	<.00053	<.0005390	<.000539	<.00053908	<.000539	<.0005390	<.000539
mean	79.565											
geomean	79.534											
count	20											
stnd dev	2.28151											

Table 5. Polynuclear Aromatic Hydrocarbon analyses (ppm,wet weight) in petrel egg, blue mussel, and soil samples, July 1992, St. Lazaria Island, Alaska Maritime National Wildlife Refuge.

	St. Lazaria Is. AMNWR - July '92 Soil and Biota Samples Organics Analyses								Polynuclear Aromatic Hydrocarbons			
catalog 7040013	biphenyl	C1-chrysenes	C1-dibenzo thiophenes	C1-Fluoran thenes & Pyrenes	C1-fluorenes	C1-naphtha lenes	C1-Phenan threnes & Anthracenes	C2-chrysenes	C2-dibenzo thiophenes	C2-fluorenes	C2-naphthal enes	C2-Phenan threnes & Anthra cenes
[illegible]												
92SLe01	0.02325	<.0114942	<.0114942	<.01149	<.011494	0.016	<.01149425	<.01149425	<.01149425	<.011494	<.01149	<.011494
[illegible]												
92SLm01	<.019607	<.0196078	<.0196078	<.01960	<.019607	<.01960	<.01960784	<.01960784	<.01960784	<.019607	<.01960	<.019607
92SLm02	<.00625	<.00625	<.00625	<.00625	<.00625	0.0098	<.00625	<.00625	<.00625	<.00625	<.00625	<.00625
92SLm03	<.00625	<.00625	<.00625	<.00625	<.00625	0.0118	<.00625	<.00625	<.00625	<.00625	<.00625	<.00625
mean												
geomean												
stnd dev												
[illegible]												
92SLs01a	0.00271	<.0004504	0.0026	<.00045	<.000450	0.0145	0.00518	<.00045045	0.00614	<.000450	0.015	0.01268
92SLs01b	0.00175	<.0003990	0.00309	<.00039	0.00382	0.0096	0.00447	<.00039904	0.00566	0.01334	0.01315	0.00929
92SLs02a	0.00177	<.0005042	0.00222	0.00321	0.00297	0.0092	0.00497	<.00050429	0.00477	0.0064	0.0137	0.00938
92SLs02b	0.0061	<.0017762	0.00668	<.00177	<.001776	0.0285	0.01152	<.0017762	0.01275	<.001776	0.03534	0.02926
92SLs03a	0.00231	<.0008375	0.00401	<.00083	0.00424	0.0115	0.00494	<.00083752	0.00804	0.01278	0.01924	0.01473
92SLs03b	0.00204	<.0005296	0.00278	0.00236	0.00458	0.0105	0.00462	<.00052966	0.00622	0.00903	0.01225	0.00958
92SLs04a	0.00303	<.0006798	0.00344	0.0056	0.00659	0.0147	0.00733	<.00067981	0.00699	0.01876	0.0174	0.01512
92SLs04b	0.00464	<.0004384	0.00282	<.00043	0.00391	0.0268	0.00321	<.0004384	0.00469	0.01535	0.01479	0.00745
92SLs05a	0.0031	<.0006896	0.00473	<.00068	0.00584	0.0111	0.00814	<.00068966	0.00868	0.01352	0.01539	0.01788
92SLs05b	0.00326	<.0007593	0.0035	<.00075	0.00557	0.0109	0.00736	<.0007593	0.00901	0.01151	0.02325	0.01453
92SLs06a	0.00177	<.0005479	0.0032	<.00054	0.00396	0.0099	0.00585	<.00054795	0.00666	0.01572	0.01404	0.01339
92SLs06b	0.00141	<.0004800	0.00382	0.00413	0.00433	0.0084	0.00558	<.00048008	0.00814	0.00776	0.01537	0.01175
92SLs07a	<.000582	<.0005827	<.0005827	<.00058	0.00101	0.0017	0.00145	<.00058275	0.00142	0.00143	0.00324	0.00228
92SLs07b	<.002066	<.0020661	<.0020661	<.00206	<.002066	0.0075	0.00259	<.00206612	0.0028	<.002066	0.00703	0.00687
92SLs08a	<.000693	<.0006934	0.00085	0.00077	0.00106	0.0031	0.00166	<.00069348	0.00193	0.00241	0.00411	0.00328
92SLs08b	<.000463	<.0004638	0.00054	<.00046	0.00068	0.0016	0.0012	<.00046382	0.00142	0.00155	0.00227	0.00159
92SLs09a	<.000458	<.0004585	0.00073	<.00045	0.00076	0.0016	0.00107	<.00045851	0.00143	0.00294	0.00323	0.00184
92SLs09b	<.000344	0.00095	0.00062	0.0013	0.00064	0.0018	0.00079	0.00089	0.0009	0.00242	0.00221	0.00162
92SLs10a	<.000616	<.0006161	0.00118	<.00061	0.00117	0.0023	0.00126	<.00061614	0.00169	0.00414	0.0039	0.00229
92SLs10b	<.000539	<.0005390	0.00062	<.00053	0.00095	0.0016	0.00108	<.00053908	0.00143	0.00288	0.00236	0.00211
mean						0.0093	0.00421		0.00504		0.01186	0.00548
geomean						0.0063	0.00319		0.00384		0.00871	0.0066
count						20	20		20		20	20
stnd dev						0.0077	0.00292		0.00334		0.00855	0.00713

Table 5. Polynuclear Aromatic Hydrocarbon analyses (ppm,wet weight) in petrel egg, blue mussel, and soil samples, July 1992, St. Lazaria Island, Alaska Maritime National Wildlife Refuge.

	St. Lazaria Is. AMNWR - July '92 Soil and Biota Samples Organics Analyses								Polynuclear Aromatic Hydrocarbons			
catalog 7040013	C3-chrysenes	C3 - dibenzo thiophenes	C3-fluorenes	C3-naphthalenes	C3-Phenanthrenes & Anthracenes	C4-chrysenes	C4-naphthalenes	C4-Phenanthrenes & Anthracenes	chrysene	dibenzothiophene	fluoranthene	fluorene
[illegible]												
92SLe01	<.0114942	<.0114942	<.0114942	<.0114942	<.0114942	<.011494	<.0114942	<.0114942	<.0114942	<.0114942	<.0114942	0.02094
[illegible]												
92SLm01	<.0196078	<.0196078	<.0196078	<.0196078	<.0196078	<.019607	<.0196078	<.0196078	<.0196078	<.0196078	<.0196078	<.019607
92SLm02	<.00625	<.00625	<.00625	<.00625	<.00625	<.00625	<.00625	<.00625	<.00625	<.00625	<.00625	<.00625
92SLm03	<.00625	<.00625	<.00625	<.00625	<.00625	<.00625	<.00625	<.00625	<.00625	<.00625	<.00625	<.00625
mean												
geomean												
stnd dev												
[illegible]												
92SLs01a	<.0004504	0.00481	<.0004504	0.0222	0.00896	<.000450	0.02317	<.0004504	0.0025	0.00098	0.00128	0.00129
92SLs01b	<.0003990	0.00541	0.01368	0.01933	0.0091	<.000399	0.01802	<.0003990	0.00149	0.00099	0.001	0.00131
92SLs02a	<.0005042	0.00472	0.01117	0.02019	0.00783	<.000504	0.02499	<.0005042	0.00156	0.00059	0.00088	0.0006
92SLs02b	<.0017762	0.0144	<.0017762	0.04212	0.02233	<.001776	0.05603	<.0017762	<.0017762	0.00273	0.00196	0.00193
92SLs03a	<.0008375	<.0008375	0.01675	0.03214	0.01145	<.000837	0.03377	<.0008375	0.00193	0.00117	0.00123	0.00145
92SLs03b	<.0005296	0.00572	0.0123	0.01952	0.00656	<.000529	0.01855	<.0005296	0.00178	0.00089	0.0012	0.00108
92SLs04a	<.0006798	0.00522	0.01238	0.02438	0.00868	<.000679	0.03018	<.0006798	0.00126	0.00098	0.00211	0.00204
92SLs04b	<.0004384	0.00419	0.01126	0.01732	0.00639	<.000438	0.02324	<.0004384	0.00134	0.00078	0.00099	0.00125
92SLs05a	<.0006896	0.00964	0.01667	0.02815	0.01612	<.000689	0.02951	<.0006896	0.00195	0.00156	0.0017	0.00179
92SLs05b	<.0007593	0.00947	0.01823	0.03372	0.02207	<.000759	0.03934	0.02215	0.00249	0.00119	0.00135	0.001
92SLs06a	<.0005479	0.00794	<.0005479	0.02552	0.01586	<.000547	0.03747	<.0005479	0.00171	0.00094	0.00118	0.00199
92SLs06b	<.0004800	0.00772	0.01643	0.02452	0.00959	<.000480	0.0228	<.0004800	0.00192	0.00087	0.00096	0.00123
92SLs07a	<.0005827	0.00148	0.00236	0.00479	0.00175	<.000582	0.00426	<.0005827	<.0005827	<.0005827	<.0005827	<.000582
92SLs07b	<.0020661	<.0020661	<.0020661	0.01372	0.00741	<.002066	<.0020661	<.0020661	<.0020661	<.0020661	<.0020661	<.002066
92SLs08a	<.0006934	0.00155	0.00246	0.00628	0.00161	<.000693	0.00632	<.0006934	<.0006934	<.0006934	<.0006934	<.000693
92SLs08b	<.0004638	0.00116	0.00179	0.00409	0.00174	<.000463	0.00388	<.0004638	<.0004638	<.0004638	<.0004638	<.000463
92SLs09a	<.0004585	0.00121	0.00223	0.00483	0.00129	<.000458	0.00477	0.00128	<.0004585	<.0004585	<.0004585	<.000458
92SLs09b	<.0003444	0.001	<.0003444	0.00374	0.00234	<.000344	0.00311	<.0003444	0.00216	<.0003444	0.00082	<.000344
92SLs10a	<.0006161	0.00173	<.0006161	0.005	0.00415	<.000616	0.00591	<.0006161	<.0006161	<.0006161	<.0006161	<.000616
92SLs10b	<.0005390	0.00111	<.0005390	0.00425	0.00232	<.000539	0.00458	<.0005390	<.0005390	<.0005390	<.0005390	<.000539
mean				0.01779	0.00838							
geomean				0.01344	0.00598							
count				20	20							
stnd dev				0.0116	0.00646							

Table 5. Polynuclear Aromatic Hydrocarbon analyses (ppm,wet weight) in petrel egg, blue mussel, and soil samples, July 1992, St. Lazaria Island, Alaska Maritime National Wildlife Refuge.

	St. Lazaria Is. AMNWR - July '92 Soil and Biota Samples Organics Analyses								Polynuclear Aromatic Hydrocarbons			
catalog 7040013	indeno (1,2,3-cd) pyrene	naphthalene	perylene	phenanthrene	pyrene	unresolved complex mixture						
92SLe01	<.011494	0.02946	<.0114942	<.0114942	0.01169	<.01149425						
92SLm01	<.019607	<.019607	<.0196078	<.0196078	<.0196078	<.01960784						
92SLm02	<.00625	0.01389	<.00625	<.00625	<.00625	20.4						
92SLm03	<.00625	0.00837	<.00625	<.00625	<.00625	2.2						
mean												
geomean												
stnd dev												
92SLs01a	0.00064	0.01369	0.00055	0.00282	0.00145	0.6						
92SLs01b	0.00048	0.00772	0.00047	0.00225	0.00147	0.5						
92SLs02a	<.000504	0.00911	<.0005042	0.00244	0.00162	0.4						
92SLs02b	<.001776	0.02347	<.0017762	0.00452	0.0022	0.6						
92SLs03a	<.000837	0.01106	<.0008375	0.00279	0.00165	0.5						
92SLs03b	<.000529	0.01086	<.0005296	0.00294	0.00162	0.7						
92SLs04a	<.000679	0.01112	<.0006798	0.00565	0.00257	0.5						
92SLs04b	<.000438	0.02873	<.0004384	0.00283	0.0012	0.7						
92SLs05a	<.000689	0.01201	<.0006896	0.00524	0.00302	0.6						
92SLs05b	0.00106	0.01166	<.0007593	0.00436	0.00241	0.5						
92SLs06a	<.000547	0.00884	<.0005479	0.00269	0.00162	0.6						
92SLs06b	<.000480	0.00818	<.0004800	0.00261	0.00175	0.6						
92SLs07a	<.000582	0.0015	<.0005827	0.00061	<.0005827	24.8						
92SLs07b	<.002066	0.00771	<.0020661	<.0020661	<.0020661	3.9						
92SLs08a	<.000693	0.00239	<.0006934	0.00088	<.0006934	3.1						
92SLs08b	<.000463	0.00131	<.0004638	0.00053	<.0004638	3.3						
92SLs09a	<.000458	0.00105	<.0004585	0.00057	<.0004585	2.4						
92SLs09b	0.0008	0.00137	0.00042	0.00049	0.00104	0.6						
92SLs10a	<.000616	0.00216	<.0006161	0.00062	<.0006161	2						
92SLs10b	<.000539	0.00169	<.0005390	<.0005390	<.0005390	1.4						
mean		0.00878				2.415						
geomean		0.00577				1.06903						
count		20				20						
stnd dev		0.00737				5.38089						

$$CPI = \frac{2\,(nC_{27} + nC_{29})}{nC_{26} + 2nC_{28} + nC_{30}}$$

A CPI of 1.0 is for petroleum, 3 to 6 is terrigenous plant waxes, and 5 to 7 for unoiled sediment. Values above 7 are also unoiled samples. All samples had CPI values greater than 1.0, indicating no petroleum hydrocarbons were present.

Another group of organic compounds associated with petroleum exposure are polycyclic aromatic hydrocarbons (PAHs). It is useful to look at both the aliphatic and PAH oil indicators to determine oil exposure. PAHs were detected in all soil samples in trace amounts (Table 5). The unresolved complex mixture is a group of hydrocarbons that have broken down and are no longer identifiable. Unresolved complex mixture detection indicates that the sample medium contained weathered petrogenic oil. The unresolved complex mixture was detected in only one soil sample (site 7) at a concentration that indicated oil exposure. Two mussel samples also had oil exposure based on detection of this mixture (Fig. 2). The egg sample had seven PAHs detected. Only biphenyl and naphthalene concentrations were greater than two times the detection limit. Both biphenyl and naphthalene are components of petroleum products.

Discussion

Metal residues in soil samples are within normal background ranges (Eisler 1984, 1985b, 1985b,1986a, 1987b, 1988a, 1988b, 1993). There is no concern that burrow-nesting seabirds are being exposed to harmful concentrations of any metals in St. Lazaria soils. There was little variability in metal concentrations among the three blue mussel samples. All metals were detected at nonharmful concentrations, however, the zinc concentration in one sample was higher than zinc residues reported in blue mussels from other Southeast Alaska locations (Rudis 1996).

There are few seabird egg contaminants data for comparison with the petrel egg. Total chromium was the only metal concentration that was elevated in comparison to data from other avian species' eggs. The significance of tissue chromium residues is unclear (Eisler 1986a). Little is known about the relation between total chromium and biological effects (Eisler 1986a). Chromium is most commonly found in the environment in the trivalent (+3) and hexavalent (+6) oxidation states. Acute and chronic effects are caused mainly by the Cr^{+6} compounds (Langar and Norseth 1979).

PAHs are products of combustion of fossil fuels, forest and prairie fires, volcanic activities, some industrial processes, and releases of petroleum. PAHs are ubiquitous because they are by-products of natural and anthropogenic processess and activities (Eisler 1987a). The low concentrations detected in soil samples are indicative of background conditions. One soil sample had 24.8 ppm WW of the unresolved hydrocarbon mixture, most likely due to an old oil fuel spill.

Bivalve molluscs tend to accumulate PAHs from water and retain them longer than other aquatic organisms (Neff 1985). This pattern of accumulation makes blue mussels an excellent species to use for a determination of PAHs in the intertidal environment of St. Lazaria Island. Naphthalenes and the unresolved complex mixture were the only PAHs detected in mussel tissue. Naphthalene was the least toxic PAH to several marine organisms used in bioassay tests (Neff 1985), and is one of the most readily

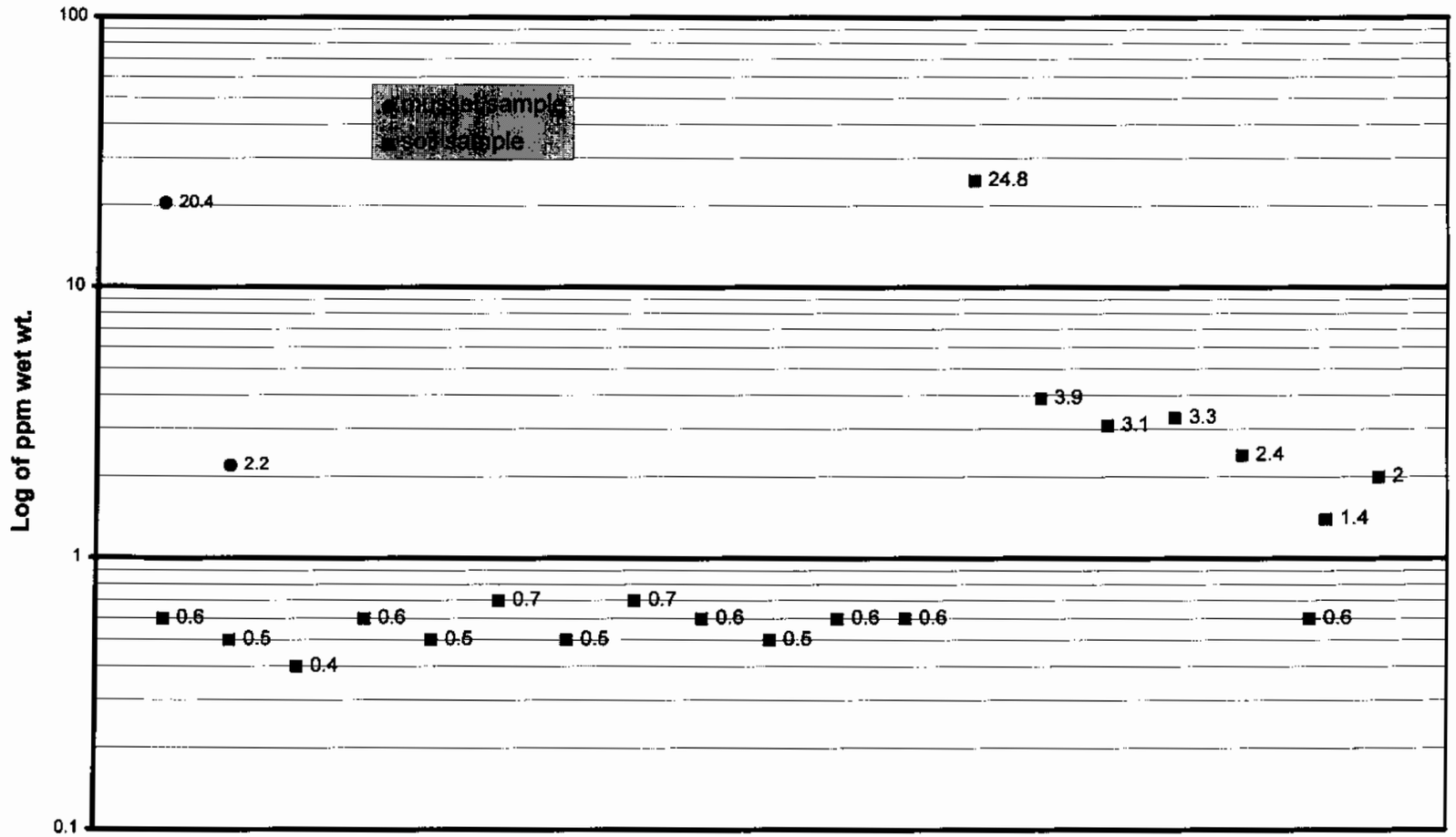


Figure 2. Unresolved complex hydrocarbon mixture (ppm - wet weight), St. Lazaria, Island, Alaska, 1992.

biodegraded PAHs.

Contaminants have long-range transport from their source via air mass movement (Barrie et al. 1995, Pacyna 1995). Organochlorines have been detected throughout the Canadian and Russian arctic thousands of miles from application areas (Barrie et al. 1995). Long-range transport might account for the trace concentrations of pesticides and PCBs detected in St. Lazaria soil and blue mussel samples.

The female sheds a significant portion of her body burden of PCBs into her eggs (Lemmetyinen and Rantamaki 1980). The more extensive list of organochlorines detected in the petrel egg were transferred from the female. Fork-tailed storm-petrels winter in the central Pacific from southern California to Japan, and Leach's storm-petrels winter in the equatorial Pacific (Harrison 1983), where they can be exposed to numerous contaminants not present on their nesting areas. All organochlorine residues reported were at very low or trace concentrations. Total PCBs (2.16 ppm WW) were comparable to concentrations reported in kittiwake (*Rissatridoctyla*) eggs (2.1 ppm WW) from Norway and arctic tern (*Sterna paradisoea*) eggs (2.9 ppm WW) from Finland (Eisler 1986b).

In summary, no organic or inorganic contaminants were detected at concentrations that indicate a contaminant source on the island. Contaminants detected in mussels indicate exposure to small amounts of weathered oil. Organochlorines were present in the petrel egg and were probably a result of adult exposure on the wintering grounds. The significance of the chromium concentration detected in the petrel egg is unclear.

These residue data can be considered baseline for St. Lazaria Island. If an oil spill occurred, the blue mussel data from this study could be used to show pre-spill conditions. It would be useful to sample additional petrel eggs and adults to look at chromium and organochlorine residues and record a more complete picture of these contaminants in resident seabirds.

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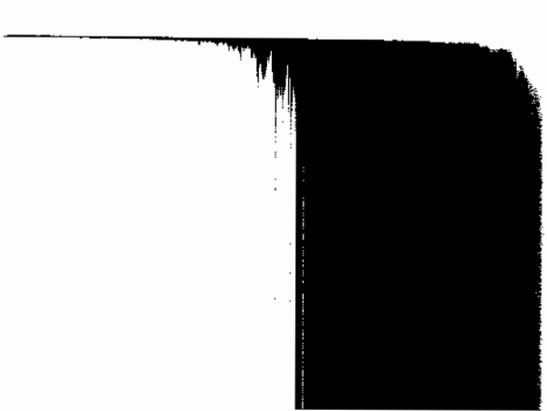
Appendix A

Analytical Results - dry and wet weights, detection limits, laboratory QA data



ST. LAZARIA METALS

ECDMS ANALYTICAL REPORT (6)

13-Apr-94

Catalog: 7040013 Regional Study Id: 7ND4 Purchase Order: 85830-2-4797

User Id: R7JFO Submitter: Deborah Rudis - Juneau, AK

Lab Name: Geochemical & Environmental Research Group, Texas A&M (GERG)

Report Includes the Following Sections:

- Weight, % Moisture, % Lipid, Total Suspended Solids
- Soil / Sediment Parameters
- Contaminant Concentrations
- Procedural Blanks
- Duplicates
- Reference Materials
- Spike Recoveries
- Comments (Result Modifers and QA/QC Comments)
- Analytical Methods

St. Lazaria AK Maritime NWR collection June '92

metals analyses

(organics not included)

ESE data - Cu, Fe, Hg, Se (= to 1 sample) lighter than Anch urban study

Zn =

Mn =

r 7413met.out (yellow label disc)

WEIGHT, % MOISTURE, % LIPID, TOTAL SUSPENDED SOLIDS

Sample Number	Sample Matrix	Sample Weight (g)	Percent Moisture	Percent Lipid	Total Suspended Solids (%)
92SLe01	Avian Egg		66.02		
92SLm01	Invertebrate		80.78		
92SLm02	Invertebrate		80.87		
92SLm03	Invertebrate		82.55		
92SLs01a	Soils		84.12		
92SLs01b	Soils		83.76		
92SLs02a	Soils		78.07		
92SLs02b	Soils		78.24		
92SLs03a	Soils		79.02		
92SLs03b	Soils		78.88		
92SLs04a	Soils		77.42		
92SLs04b	Soils		77.09		
92SLs05a	Soils		79.72		
92SLs05b	Soils		79.26		
92SLs06a	Soils		84.04		
92SLs06b	Soils		83.32		
92SLs07a	Soils		78.32		
92SLs07b	Soils		77.82		
92SLs08a	Soils		79.75		
92SLs08b	Soils		79.26		
92SLs09a	Soils		80.43		
92SLs09b	Soils		80.42		
92SLs10a	Soils		78.03		
92SLs10b	Soils		77.24		

SOIL / SEDIMENT PARAMETERS

Sample Number	Percent TVS	Percent TOC	Particle Size %Sand	%Silt	%Clay
92SLs01a		47.97			
92SLs01b		45.72			
92SLs02a		46.17			
92SLs02b		49.16			
92SLs03a		47.6			
92SLs03b		47.22			
92SLs04a		46.23			
92SLs04b		46.35			
92SLs05a		45.38			
92SLs05b		L 43.33			
92SLs06a		48.61			
92SLs06b		53.64			
92SLs07a		H 53.79			
92SLs07b		48.4			
92SLs08a		47.6			
92SLs08b		50.1			
92SLs09a		49.4			
92SLs09b		50.3			
92SLs10a		49.2			
92SLs10b		47.5			

CONTAMINANT CONCENTRATIONS

Detection Limit Analyte (ppm Wet Wt.)	Sample Number	Sample Matrix	Result (ppm Dry Wt.)	Detection Limit (ppm Dry Wt.)	Result (ppm Wet Wt.)
Al					
3.77178	92SLe01	Avian Egg	13.48	11.1	4.580504
2.13342	92SLm01	Invertebrate	303.25	11.1	58.28465
2.12343	92SLm02	Invertebrate	13	11.1	2.4869
1.93695	92SLm03	Invertebrate	73.63	11.1	12.848435
1.588	92SLs01a	Soils	< 10	10	< 1.588
1.624	92SLs01b	Soils	116	10	18.8384
2.193	92SLs02a	Soils	211	10	46.2723
2.176	92SLs02b	Soils	301	10	65.4976
2.098	92SLs03a	Soils	325	10	68.185
2.112	92SLs03b	Soils	391	10	82.5792
2.258	92SLs04a	Soils	890	10	200.962
2.291	92SLs04b	Soils	761	10	174.3451
2.028	92SLs05a	Soils	1447	10	293.4516
2.074	92SLs05b	Soils	1140	10	236.436
1.596	92SLs06a	Soils	483	10	77.0868
1.668	92SLs06b	Soils	796	10	132.7728
2.168	92SLs07a	Soils	301	10	65.2568
2.218	92SLs07b	Soils	294	10	65.2092
2.025	92SLs08a	Soils	228	10	46.17
2.074	92SLs08b	Soils	143	10	29.6582
1.957	92SLs09a	Soils	133	10	26.0281
1.958	92SLs09b	Soils	146	10	28.5868
2.197	92SLs10a	Soils	165	10	36.2505
2.276	92SLs10b	Soils	263	10	59.8588
[redacted]					
.1699	92SLe01	Avian Egg	.59	.5	.200482
.0961	92SLm01	Invertebrate	8.12	.5	1.560664
.09565	92SLm02	Invertebrate	8.01	.5	1.532313
.08725	92SLm03	Invertebrate	8.68	.5	1.51466
.0794	92SLs01a	Soils	.69	.5	.109572
.0812	92SLs01b	Soils	1.07	.5	.173768
.10965	92SLs02a	Soils	1.87	.5	.410091
.1088	92SLs02b	Soils	1.75	.5	.3808
.1049	92SLs03a	Soils	1.11	.5	.232878

CONTAMINANT CONCENTRATIONS (Cont.)

Analyte	Sample Number	Sample Matrix	Result (ppm Dry Wt.)	Detection Limit (ppm Dry Wt.)	Result (ppm Wet Wt.)	Detection Limit (ppm Wet Wt.)
As	92SLs03b	Soils	1.12	.5	.236544	.1056
	92SLs04a	Soils	1.21	.5	.273218	.1129
	92SLs04b	Soils	1.31	.5	.300121	.11455
	92SLs05a	Soils	1.05	.5	.21294	.1014
	92SLs05b	Soils	.99	.5	.205326	.1037
	92SLs06a	Soils	.78	.5	.124488	.0798
	92SLs06b	Soils	.56	.5	.093408	.0834
	92SLs07a	Soils	1.37	.5	.297016	.1084
	92SLs07b	Soils	1.49	.5	.330482	.1109
	92SLs08a	Soils	1	.5	.2025	.10125
	92SLs08b	Soils	1.36	.5	.282064	.1037
	92SLs09a	Soils	1.86	.5	.364002	.09785
	92SLs09b	Soils	1.13	.5	.221254	.0979
	92SLs10a	Soils	1.1	.5	.24167	.10985
	92SLs10b	Soils	1.08	.5	.245808	.1138
Cd	92SLe01	Avian Egg	< .1	.1	< .03398	.03398
	92SLm01	Invertebrate	3.77	.1	.724594	.01922
	92SLm02	Invertebrate	4.34	.1	.830242	.01913
	92SLm03	Invertebrate	4.83	.1	.842835	.01745
low	92SLs01a	Soils	< .2	.2	< .03176	.03176
	92SLs01b	Soils	< .2	.2	< .03248	.03248
	92SLs02a	Soils	< .2	.2	< .04386	.04386
	92SLs02b	Soils	.23	.2	.050048	.04352
	92SLs03a	Soils	.3	.2	.06294	.04196
	92SLs03b	Soils	.31	.2	.065472	.04224
	92SLs04a	Soils	.59	.2	.133222	.04516
	92SLs04b	Soils	.56	.2	.128296	.04582
	92SLs05a	Soils	.21	.2	.042588	.04056
	92SLs05b	Soils	< .2	.2	< .04148	.04148
	92SLs06a	Soils	.43	.2	.068628	.03192
	92SLs06b	Soils	.41	.2	.068388	.03336
	92SLs07a	Soils	.62	.2	.134416	.04336
	92SLs07b	Soils	.59	.2	.130862	.04436
	92SLs08a	Soils	< .2	.2	< .0405	.0405
Cd	92SLs08b	Soils	< .2	.2	< .04148	.04148
	92SLs09a	Soils	< .2	.2	< .03914	.03914
	92SLs09b	Soils	.23	.2	.045034	.03916
	92SLs10a	Soils	.87	.2	.191139	.04394
	92SLs10b	Soils	3.09	.2	.703284	.04552
Cr	92SLe01	Avian Egg	9.27	4.02	3.149946	1.365996
	92SLm01	Invertebrate	< 4.02	4.02	< .772644	.772644
	92SLm02	Invertebrate	< 4.02	4.02	< .769026	.769026
	92SLm03	Invertebrate	< 4.02	4.02	< .70149	.70149
	92SLs01a	Soils	2.87	1	.455756	.1588
	92SLs01b	Soils	1.6	1	.25984	.1624
	92SLs02a	Soils	2.1	1	.46053	.2193
	92SLs02b	Soils	1.09	1	.237184	.2176
	92SLs03a	Soils	< 1	1	< .2098	.2098
	92SLs03b	Soils	< 1	1	< .2112	.2112
	92SLs04a	Soils	< 1	1	< .2258	.2258
	92SLs04b	Soils	< 1	1	< .2291	.2291
	92SLs05a	Soils	< 1	1	< .2028	.2028
	92SLs05b	Soils	< 1	1	< .2074	.2074
	92SLs06a	Soils	< 1	1	< .1596	.1596
	92SLs06b	Soils	< 1	1	< .1668	.1668
	92SLs07a	Soils	1.08	1	.234144	.2168
	92SLs07b	Soils	1.31	1	.290558	.2218
	92SLs08a	Soils	< 1	1	< .2025	.2025
	92SLs08b	Soils	< 1	1	< .2074	.2074
	92SLs09a	Soils	2.15	1	.420755	.1957
	92SLs09b	Soils	3.8	1	.74404	.1958
	92SLs10a	Soils	2.57	1	.564629	.2197
	92SLs10b	Soils	2.61	1	.594036	.2276
Cu	92SLe01	Avian Egg	5.09	.78	1.729582	.265044
	92SLm01	Invertebrate	6.2	.78	1.19164	.149916
	92SLm02	Invertebrate	5.77	.78	1.103801	.149214
	92SLm03	Invertebrate	6.1	.78	1.06445	.13611

CONTAMINANT CONCENTRATIONS (Cont.)

Analyte	Sample Number	Sample Matrix	Result (ppm Dry Wt.)	Detection Limit (ppm Dry Wt.)	Result (ppm Wet Wt.)	Detection Limit (ppm Wet Wt.)
Cu	92SLs01a	Soils	7.54	1	1.197352	.1588
	92SLs01b	Soils	10.89	1	1.768536	.1624
	92SLs02a	Soils	14.93	1	3.274149	.2193
	92SLs02b	Soils	15.32	1	3.333632	.2176
	92SLs03a	Soils	14.85	1	3.11553	.2098
	92SLs03b	Soils	11.81	1	2.494272	.2112
	92SLs04a	Soils	8.42	1	1.901236	.2258
	92SLs04b	Soils	9.2	1	2.10772	.2291
	92SLs05a	Soils	11.96	1	2.425488	.2028
	92SLs05b	Soils	19.31	1	4.004894	.2074
	92SLs06a	Soils	10.62	1	1.694952	.1596
	92SLs06b	Soils	5.74	1	.957432	.1668
	92SLs07a	Soils	13.84	1	3.000512	.2168
	92SLs07b	Soils	14.48	1	3.211664	.2218
	92SLs08a	Soils	8.13	1	1.646325	.2025
	92SLs08b	Soils	9.81	1	2.034594	.2074
	92SLs09a	Soils	13.61	1	2.663477	.1957
	92SLs09b	Soils	12.64	1	2.474912	.1958
	92SLs10a	Soils	11.95	1	2.625415	.2197
	92SLs10b	Soils	18.51	1	4.212876	.2276
Fe	92SLe01	Avian Egg	283.07	1.38	96.187186	.468924
	92SLm01	Invertebrate	202	1.38	38.8244	.265236
	92SLm02	Invertebrate	92.3	1.38	17.65699	.263994
	92SLm03	Invertebrate	142.04	1.38	24.78598	.24081
	92SLs01a	Soils	180	10	28.584	1.588
	92SLs01b	Soils	141	10	22.8984	1.624
	92SLs02a	Soils	241	10	52.8513	2.193
	92SLs02b	Soils	198	10	43.0848	2.176
	92SLs03a	Soils	237	10	49.7226	2.098
	92SLs03b	Soils	328	10	69.2736	2.112
	92SLs04a	Soils	866	10	195.5428	2.258
	92SLs04b	Soils	790	10	180.989	2.291
	92SLs05a	Soils	1892	10	383.6976	2.028
	92SLs05b	Soils	1622	10	336.4028	2.074
Fe	92SLs06a	Soils	153	10	24.4188	1.596
	92SLs06b	Soils	658	10	109.7544	1.668
	92SLs07a	Soils	90	10	19.512	2.168
	92SLs07b	Soils	144	10	31.9392	2.218
	92SLs08a	Soils	65	10	13.1625	2.025
	92SLs08b	Soils	272	10	56.4128	2.074
	92SLs09a	Soils	120	10	23.484	1.957
	92SLs09b	Soils	35	10	6.853	1.958
	92SLs10a	Soils	70	10	15.379	2.197
	92SLs10b	Soils	247	10	56.2172	2.276
Hg	92SLe01	Avian Egg	1.068	.1	.362906	.03398
	92SLm01	Invertebrate	< .1	.1	< .01922	.01922
	92SLm02	Invertebrate	< .1	.1	< .01913	.01913
	92SLm03	Invertebrate	.1	.1	.01745	.01745
	92SLs01a	Soils	.209	.1	.033189	.01588
	92SLs01b	Soils	.284	.1	.046122	.01624
	92SLs02a	Soils	.291	.1	.063816	.02193
	92SLs02b	Soils	.273	.1	.059405	.02176
	92SLs03a	Soils	.248	.1	.05203	.02098
	92SLs03b	Soils	.251	.1	.053011	.02112
	92SLs04a	Soils	.277	.1	.062547	.02258
	92SLs04b	Soils	.276	.1	.063232	.02291
	92SLs05a	Soils	.39	.1	.079092	.02028
	92SLs05b	Soils	.408	.1	.084619	.02074
	92SLs06a	Soils	.283	.1	.045167	.01596
	92SLs06b	Soils	.236	.1	.039365	.01668
	92SLs07a	Soils	.29	.1	.062872	.02168
	92SLs07b	Soils	.401	.1	.088942	.02218
	92SLs08a	Soils	.254	.1	.051435	.02025
	92SLs08b	Soils	.24	.1	.049776	.02074
	92SLs09a	Soils	.413	.1	.080824	.01957
	92SLs09b	Soils	.382	.1	.074796	.01958
	92SLs10a	Soils	.372	.1	.081728	.02197
	92SLs10b	Soils	.802	.1	.182535	.02276

CONTAMINANT CONCENTRATIONS (Cont.)

Analyte	Sample Number	Sample Matrix	Result (ppm Dry Wt.)	Detection Limit (ppm Dry Wt.)	Result (ppm Wet Wt.)	Detection Limit (ppm Wet Wt.)
Mn	92SLe01	Avian Egg	3.73	.3	1.267454	.10194
	92SLm01	Invertebrate	5.59	.3	1.074398	.05766
	92SLm02	Invertebrate	6.42	.3	1.228146	.05739
	92SLm03	Invertebrate	5.69	.3	.992905	.05235
	92SLs01a	Soils	< 5	5	< .794	.794
	92SLs01b	Soils	< 5	5	< .812	.812
	92SLs02a	Soils	< 5	5	< 1.0965	1.0965
	92SLs02b	Soils	< 5	5	< 1.088	1.088
	92SLs03a	Soils	6.2	5	1.30076	1.049
	92SLs03b	Soils	6.3	5	1.33056	1.056
	92SLs04a	Soils	21	5	4.7418	1.129
	92SLs04b	Soils	11.5	5	2.63465	1.1455
	92SLs05a	Soils	10.7	5	2.16996	1.014
	92SLs05b	Soils	9.7	5	2.01178	1.037
	92SLs06a	Soils	5.5	5	.8778	.798
	92SLs06b	Soils	9.1	5	1.51788	.834
	92SLs07a	Soils	< 5	5	< 1.084	1.084
	92SLs07b	Soils	8.2	5	1.81876	1.109
	92SLs08a	Soils	< 5	5	< 1.0125	1.0125
	92SLs08b	Soils	5.1	5	1.05774	1.037
	92SLs09a	Soils	6.2	5	1.21334	.9785
	92SLs09b	Soils	< 5	5	< .979	.979
	92SLs10a	Soils	12.5	5	2.74625	1.0985
	92SLs10b	Soils	14.2	5	3.23192	1.138
Ni	92SLe01	Avian Egg	< 2.64	2.64	< .897072	.897072
	92SLm01	Invertebrate	< 2.64	2.64	< .507408	.507408
	92SLm02	Invertebrate	< 2.64	2.64	< .505032	.505032
	92SLm03	Invertebrate	2.77	2.64	.483365	.46068
	92SLs01a	Soils	< 5	5	< .794	.794
	92SLs01b	Soils	< 5	5	< .812	.812
	92SLs02a	Soils	< 5	5	< 1.0965	1.0965
	92SLs02b	Soils	< 5	5	< 1.088	1.088
	92SLs03a	Soils	< 5	5	< 1.049	1.049
Ni	92SLs03b	Soils	< 5	5	< 1.056	1.056
	92SLs04a	Soils	< 5	5	< 1.129	1.129
	92SLs04b	Soils	< 5	5	< 1.1455	1.1455
	92SLs05a	Soils	< 5	5	< 1.014	1.014
	92SLs05b	Soils	< 5	5	< 1.037	1.037
	92SLs06a	Soils	< 5	5	< .798	.798
	92SLs06b	Soils	< 5	5	< .834	.834
	92SLs07a	Soils	< 5	5	< 1.084	1.084
	92SLs07b	Soils	< 5	5	< 1.109	1.109
	92SLs08a	Soils	< 5	5	< 1.0125	1.0125
	92SLs08b	Soils	< 5	5	< 1.037	1.037
	92SLs09a	Soils	< 5	5	< .9785	.9785
	92SLs09b	Soils	< 5	5	< .979	.979
	92SLs10a	Soils	< 5	5	< 1.0985	1.0985
	92SLs10b	Soils	< 5	5	< 1.138	1.138
Pb	92SLe01	Avian Egg	.51	.5	.173298	.1699
	92SLm01	Invertebrate	.81	.5	.155682	.0961
	92SLm02	Invertebrate	.67	.5	.128171	.09565
	92SLm03	Invertebrate	.89	.5	.155305	.08725
Low ND	92SLs01a	Soils	< 5	5	< .794	.794
	92SLs01b	Soils	< 5	5	< .812	.812
	92SLs02a	Soils	< 5	5	< 1.0965	1.0965
	92SLs02b	Soils	< 5	5	< 1.088	1.088
	92SLs03a	Soils	< 5	5	< 1.049	1.049
	92SLs03b	Soils	< 5	5	< 1.056	1.056
	92SLs04a	Soils	< 5	5	< 1.129	1.129
	92SLs04b	Soils	< 5	5	< 1.1455	1.1455
	92SLs05a	Soils	< 5	5	< 1.014	1.014
	92SLs05b	Soils	< 5	5	< 1.037	1.037
	92SLs06a	Soils	< 5	5	< .798	.798
	92SLs06b	Soils	< 5	5	< .834	.834
	92SLs07a	Soils	< 5	5	< 1.084	1.084
	92SLs07b	Soils	< 5	5	< 1.109	1.109
	92SLs08a	Soils	< 5	5	< 1.0125	1.0125

CONTAMINANT CONCENTRATIONS (Cont.)

Analyte	Sample Number	Sample Matrix	Result (ppm Dry Wt.)	Detection Limit (ppm Dry Wt.)	Result (ppm Wet Wt.)	Detection Limit (ppm Wet Wt.)
Pb	92SLs08b	Soils	< 5	5	< 1.037	1.037
	92SLs09a	Soils	< 5	5	< .9785	.9785
	92SLs09b	Soils	< 5	5	< .979	.979
	92SLs10a	Soils	< 5	5	< 1.0985	1.0985
	92SLs10b	Soils	< 5	5	< 1.138	1.138
Se	92SLe01	Avian Egg	5.67	.5	1.926666	.1699
	92SLm01	Invertebrate	2.92	.5	.561224	.0961
	92SLm02	Invertebrate	2.92	.5	.558596	.09565
	92SLm03	Invertebrate	2.82	.5	.49209	.08725
	92SLs01a	Soils	1.39	1	.220732	.1588
	92SLs01b	Soils	1.01	1	.164024	.1624
	92SLs02a	Soils	1.89	1	.414477	.2193
	92SLs02b	Soils	2.57	1	.559232	.2176
	92SLs03a	Soils	2.43	1	.509814	.2098
	92SLs03b	Soils	1.06	1	.223872	.2112
	92SLs04a	Soils	2.17	1	.489986	.2258
	92SLs04b	Soils	2.02	1	.462782	.2291
	92SLs05a	Soils	1.36	1	.275808	.2028
	92SLs05b	Soils	2.82	1	.584868	.2074
	92SLs06a	Soils	1.41	1	.225036	.1596
	92SLs06b	Soils	1.57	1	.261876	.1668
	92SLs07a	Soils	2.86	1	.620048	.2168
	92SLs07b	Soils	3.36	1	.745248	.2218
	92SLs08a	Soils	< 1	1	< .2025	.2025
	92SLs08b	Soils	1.54	1	.319396	.2074
	92SLs09a	Soils	3.57	1	.698649	.1957
	92SLs09b	Soils	1.22	1	.238876	.1958
	92SLs10a	Soils	2.47	1	.542659	.2197
	92SLs10b	Soils	1.83	1	.416508	.2276
Zn	92SLe01	Avian Egg	56.39	1.2	19.161322	.40776
	92SLm01	Invertebrate	121.43	1.2	23.338846	.23064
	92SLm02	Invertebrate	112.37	1.2	21.496381	.22956
	92SLm03	Invertebrate	97.56	1.2	17.02422	.2094

Analyte	Sample Number	Sample Matrix	Result (ppm Dry Wt.)	Detection Limit (ppm Dry Wt.)	Result (ppm Wet Wt.)	Detection Limit (ppm Wet Wt.)
Zn	92SLs01a	Soils	13.8	5	2.19144	.794
	92SLs01b	Soils	7.6	5	1.23424	.812
	92SLs02a	Soils	5.9	5	1.29387	1.0965
	92SLs02b	Soils	10.1	5	2.19776	1.088
	92SLs03a	Soils	9	5	1.8882	1.049
	92SLs03b	Soils	5.2	5	1.09824	1.056
	92SLs04a	Soils	8.4	5	1.89672	1.129
	92SLs04b	Soils	< 5	5	< 1.1455	1.1455
	92SLs05a	Soils	< 5	5	< 1.014	1.014
	92SLs05b	Soils	10	5	2.074	1.037
	92SLs06a	Soils	< 5	5	< .798	.798
	92SLs06b	Soils	6.8	5	1.13424	.834
	92SLs07a	Soils	6.5	5	1.4092	1.084
	92SLs07b	Soils	10.2	5	2.26236	1.109
	92SLs08a	Soils	5.5	5	1.11375	1.0125
	92SLs08b	Soils	6.7	5	1.38958	1.037
	92SLs09a	Soils	< 5	5	< .9785	.9785
	92SLs09b	Soils	< 5	5	< .979	.979
	92SLs10a	Soils	22.9	5	5.03113	1.0985
	92SLs10b	Soils	55.9	5	12.72284	1.138

PROCEDURAL BLANKS

Analyte	Lab Sample Number	Result Total UG
% Moisture	BLANK-A	
	BLANK-B	
	BLANK-C	
	BLANK-D	
	BLANK-E	
	BLANK-F	
Al	BLANK-A	< 10
	BLANK-A	< 11.1
	BLANK-B	< 10
	BLANK-B	< 11.1
	BLANK-C	< 10
	BLANK-C	< 11.1
As	BLANK-A	< .5
	BLANK-B	< .5
	BLANK-C	< .5
	BLANK-D	< .5
	BLANK-E	< .5
	BLANK-F	< .5
Cd	BLANK-A	< .2
	BLANK-B	< .2
	BLANK-C	< .2
	BLANK-D	< .1
	BLANK-E	< .1
	BLANK-F	< .1
Cr	BLANK-A	1.54
	BLANK-A	< 4.02
	BLANK-B	1.88
	BLANK-B	< 4.02
	BLANK-C	< 1
	BLANK-C	< 4.02
Cu	BLANK-A	1.88
	BLANK-A	< .78
	BLANK-B	1.19
	BLANK-B	< .78
	BLANK-C	< 1
	BLANK-C	< .78
Fe	BLANK-A	< 10
	BLANK-A	< 1.38
	BLANK-B	< 10
	BLANK-B	2.5
	BLANK-C	< 10
	BLANK-C	< 1.38
Hg	BLANK-A	< .1
	BLANK-B	< .1
	BLANK-C	< .1
	BLANK-D	< .1
	BLANK-E	< .1
	BLANK-F	< .1
Mn	BLANK-A	< 5
	BLANK-A	< .3
	BLANK-B	< 5
	BLANK-B	< .3
	BLANK-C	< 5
	BLANK-C	< .3
Ni	BLANK-A	< 5
	BLANK-A	< 2.64
	BLANK-B	< 5
	BLANK-B	< 2.64
	BLANK-C	< 5
	BLANK-C	< 2.64

PROCEDURAL BLANKS (Cont.)

Analyte	Lab Sample Number	Result Total UG
Pb	BLANK-A	< 5
	BLANK-B	< 5
	BLANK-C	< 5
	BLANK-D	.94
	BLANK-E	< .5
	BLANK-F	< .5
Se	BLANK-A	< 1
	BLANK-B	< 1
	BLANK-C	< 1
	BLANK-D	< .5
	BLANK-E	< .5
	BLANK-F	< .5
Zn	BLANK-A	7.4
	BLANK-A	< 1.2
	BLANK-B	7.3
	BLANK-B	1.38
	BLANK-C	< 5
	BLANK-C	< 1.2

DUPLICATES

Analyte	Sample Number	Sample Matrix	Initial Result (ppm / %)	Duplicate Result (ppm / %)	Average	Relative % Difference
% Moisture	92SLs02b	Soils	78.24 %	77.81 %	78.025	0.55
	92SLs07b	Soils	77.82 %	78.05 %	77.935	0.3
Al	92SLs02b	Soils	301 Dry	311 Dry	306	3.27
	92SLs07b	Soils	294 Dry	321 Dry	307.5	8.78
As	92SLs02b	Soils	1.75 Dry	1.74 Dry	1.745	0.57
	92SLs07b	Soils	1.49 Dry	1.53 Dry	1.51	2.65
Cd	92SLs02b	Soils	.23 Dry	.23 Dry	0.23	0
	92SLs07b	Soils	.59 Dry	.6 Dry	0.595	1.68
Cr	92SLs02b	Soils	1.09 Dry	2.37 Dry	1.73	73.99
	92SLs07b	Soils	1.31 Dry	< 1 Dry	0.905	89.5
Cu	92SLs02b	Soils	15.32 Dry	12.73 Dry	14.025	18.47
	92SLs07b	Soils	14.48 Dry	18 Dry	16.24	21.67
Fe	92SLs02b	Soils	198 Dry	250 Dry	224	23.21
	92SLs07b	Soils	144 Dry	174 Dry	159	18.87
Hg	92SLs02b	Soils	.273 Dry	.312 Dry	0.2925	13.33
	92SLs07b	Soils	.401 Dry	.324 Dry	0.3625	21.24
Mn	92SLs02b	Soils	< 5 Dry	6 Dry	4.25	82.35
	92SLs07b	Soils	8.2 Dry	< 5 Dry	5.35	106.54
Ni	92SLs02b	Soils	< 5 Dry	< 5 Dry	2.5	0
	92SLs07b	Soils	< 5 Dry	< 5 Dry	2.5	0
Pb	92SLs02b	Soils	< 5 Dry	< 5 Dry	2.5	0
	92SLs07b	Soils	< 5 Dry	< 5 Dry	2.5	0
Se	92SLs02b	Soils	2.57 Dry	3.37 Dry	2.97	26.94
Se	92SLs07b	Soils	3.36 Dry	2.34 Dry	2.85	35.79
Tot. Organic Carbon						
	92SLs02b	Soils	49.16 %	47.18 %	48.17	4.11
	92SLs07b	Soils	48.4 %	47.5 %	47.95	1.88
Zn	92SLs02b	Soils	10.1 Dry	15.7 Dry	12.9	43.41
	92SLs07b	Soils	10.2 Dry	5.9 Dry	8.05	53.42

REFERENCE MATERIALS

Analyte	Lab Sample Number	S.R.M. ID	S.R.M. Name	* Certified Reference Value (ppm / %)	95% Confidence Interval	Result (ppm / %)	Percent Recovery
Al	NBSOYS-A	NIST 1566a	Oyster Tissue	202.5 Dry	12.5	123.75 Dry	61.11
	BCSS-C	NRCC BCSS-1				22580.4 Dry	
	BCSS-D	NRCC BCSS-1				20520.6 Dry	
	DORM-A	NRCC DORM-1				< 11.1 Dry	
	DORM-B	NRCC DORM-1				< 11.1 Dry	
As	NBSOYS-A	NIST 1566a	Oyster Tissue	14 Dry	1.2	14.03 Dry	100.21
	BCSS-C	NRCC BCSS-1	Sediment	11.1 Dry	1.4	10.3885 Dry	93.59
	BCSS-D	NRCC BCSS-1	Sediment	11.1 Dry	1.4	10.0466 Dry	90.51
	DORM-A	NRCC DORM-1	Dogfish Muscle	17.7 Dry	2.1	15.7 Dry	88.7
	DORM-B	NRCC DORM-1	Dogfish Muscle	17.7 Dry	2.1	13.7 Dry	77.4
Cd	NBSOYS-A	NIST 1566a	Oyster Tissue	4.15 Dry	.38	3.89 Dry	93.73
	BCSS-C	NRCC BCSS-1	Sediment	.25 Dry	.4	.23391 Dry	93.56
	BCSS-D	NRCC BCSS-1	Sediment	.25 Dry	.4	.2193 Dry	87.72
	DORM-A	NRCC DORM-1	Dogfish Muscle	.086 Dry	.012	< .1 Dry	116.28
	DORM-B	NRCC DORM-1	Dogfish Muscle	.086 Dry	.012	< .1 Dry	116.28
Cr	NBSOYS-A	NIST 1566a	Oyster Tissue	1.43 Dry	.46	< 4.02 Dry	281.12
	BCSS-C	NRCC BCSS-1	Sediment	123 Dry	14	63.9074 Dry	51.96
	BCSS-D	NRCC BCSS-1	Sediment	123 Dry	14	60.198 Dry	48.94
	DORM-A	NRCC DORM-1	Dogfish Muscle	3.6 Dry	.4	< 4.02 Dry	111.67
	DORM-B	NRCC DORM-1	Dogfish Muscle	3.6 Dry	.4	< 4.02 Dry	111.67
Cu	NBSOYS-A	NIST 1566a	Oyster Tissue	66.3 Dry	4.3	62.72 Dry	94.6
	BCSS-C	NRCC BCSS-1	Sediment	18.5 Dry	2.7	17.03 Dry	92.05
	BCSS-D	NRCC BCSS-1	Sediment	18.5 Dry	2.7	16.04 Dry	86.7
	DORM-A	NRCC DORM-1	Dogfish Muscle	5.22 Dry	.33	4.55 Dry	87.16
	DORM-B	NRCC DORM-1	Dogfish Muscle	5.22 Dry	.33	4.24 Dry	81.23
Fe	NBSOYS-A	NIST 1566a	Oyster Tissue	539 Dry	15	515.06 Dry	95.56

* Only certified analytes list a confidence interval - all others are considered reference values.

REFERENCE MATERIALS (Cont.)

Analyte	Lab Sample Number	S.R.M. ID	S.R.M. Name	* Certified Reference Value (ppm / %)	95% Confidence Interval	Result (ppm / %)	Percent Recovery
Fe	BCSS-C	NRCC BCSS-1				32432 Dry	
	BCSS-D	NRCC BCSS-1				30252 Dry	
95.39	DORM-A	NRCC DORM-1	Dogfish Muscle	63.6 Dry	5.3	60.67 Dry	
108.92	DORM-B	NRCC DORM-1	Dogfish Muscle	63.6 Dry	5.3	69.27 Dry	
Hg	NBSOYS-A	NIST 1566a	Oyster Tissue	.0642 Dry	.0067	< .1 Dry	
155.76	BEST-A	NRCC BEST-1	Sediment	.092 Dry	.009	< .1 Dry	
108.7	BEST-B	NRCC BEST-1	Sediment	.092 Dry	.009	< .1 Dry	
108.7	BEST-C	NRCC BEST-1	Sediment	.092 Dry	.009	< .1 Dry	
108.7	DORM-A	NRCC DORM-1	Dogfish Muscle	.798 Dry	.074	.819 Dry	
102.63	DORM-B	NRCC DORM-1	Dogfish Muscle	.798 Dry	.074	.753 Dry	
94.36							
Mn	NBSOYS-A	NIST 1566a	Oyster Tissue	12.3 Dry	1.5	11.53 Dry	
93.74	BCSS-C	NRCC BCSS-1	Sediment	229 Dry	15	238.812 Dry	
104.28	BCSS-D	NRCC BCSS-1	Sediment	229 Dry	15	235.536 Dry	
102.85	DORM-A	NRCC DORM-1	Dogfish Muscle	1.32 Dry	.26	1.15 Dry	
87.12	DORM-B	NRCC DORM-1	Dogfish Muscle	1.32 Dry	.26	1.07 Dry	
81.06							
Ni	NBSOYS-A	NIST 1566a	Oyster Tissue	2.25 Dry	.44	< 2.64 Dry	
117.33	BCSS-C	NRCC BCSS-1	Sediment	55.3 Dry	3.6	56.09 Dry	
101.43	BCSS-D	NRCC BCSS-1	Sediment	55.3 Dry	3.6	56.11 Dry	
101.46	DORM-A	NRCC DORM-1	Dogfish Muscle	1.2 Dry	.3	< 2.64 Dry	
220	DORM-B	NRCC DORM-1	Dogfish Muscle	1.2 Dry	.3	< 2.64 Dry	
220							
Pb	NBSOYS-A	NIST 1566a	Oyster Tissue	.371 Dry	.014	< .5 Dry	
134.77	BCSS-C	NRCC BCSS-1	Sediment	22.7 Dry	3.4	20.43 Dry	
90	BCSS-D	NRCC BCSS-1	Sediment	22.7 Dry	3.4	19.28 Dry	
84.93	DORM-A	NRCC DORM-1	Dogfish Muscle	.4 Dry	.12	.51 Dry	
127.5	DORM-B	NRCC DORM-1	Dogfish Muscle	.4 Dry	.12	< .5 Dry	
125							
Se	NBSOYS-A	NIST 1566a	Oyster Tissue	2.21 Dry	.24	2.28 Dry	
103.17	BCSS-C	NRCC BCSS-1	Sediment	.43 Dry	.06	< 1 Dry	
232.56							

* Only certified analytes list a confidence interval - all others are considered reference values.

REFERENCE MATERIALS (Cont.)

Analyte	Lab Sample Number	S.R.M. ID	S.R.M. Name	* Certified Reference Value (ppm / %)	95% Confidence Interval	Result (ppm / %)	Percent Recovery
Se	BCSS-D	NRCC BCSS-1	Sediment	.43 Dry	.06	< 1 Dry	
232.56							
	DORM-A	NRCC DORM-1	Dogfish Muscle	1.62 Dry	.12	1.86 Dry	
114.81							
	DORM-B	NRCC DORM-1	Dogfish Muscle	1.62 Dry	.12	1.41 Dry	
87.04							
Zn	NBSOYS-A	NIST 1566a	Oyster Tissue	830 Dry	57	880.76 Dry	
106.12							
	BCSS-C	NRCC BCSS-1	Sediment	119 Dry	12	108.2 Dry	
90.92							
	BCSS-D	NRCC BCSS-1	Sediment	119 Dry	12	110.5 Dry	
92.86							
	DORM-A	NRCC DORM-1	Dogfish Muscle	21.3 Dry	1	19.75 Dry	
92.72							
	DORM-B	NRCC DORM-1	Dogfish Muscle	21.3 Dry	1	19.18 Dry	
90.05							

* Only certified analytes list a confidence interval - all others are considered reference values.

SPIKE RECOVERIES

Analyte	Sample Number	Sample Matrix	Spike Level (ppm / %)	Amount Recovered (ppm / %)	* Spike / Background	Percent Recovery
As	92SLs08b	Soils	20.81 Dry	21.12 Dry	15.3	101.49
	92SLs10a	Soils	14.13 Dry	14.26 Dry	12.85	100.92
Cd	92SLs08b	Soils	8.66 Dry	7.49 Dry	43.3	86.49
	92SLs10a	Soils	4.45 Dry	3.21 Dry	5.11	72.13
Cr	92SLs08b	Soils	76.33 Dry	64.26 Dry	76.33	84.19
	92SLs10a	Soils	51.81 Dry	55.62 Dry	20.16	107.35
Cu	92SLs08b	Soils	83.24 Dry	78.47 Dry	8.49	94.27
	92SLs10a	Soils	56.5 Dry	61.92 Dry	4.73	109.59
Fe	92SLs08b	Soils	19976.88 Dry	15388 Dry	73.44	77.03
	92SLs10a	Soils	13792.74 Dry	11980 Dry	197.04	86.86
Hg	92SLs08b	Soils	.52 Dry	0.569 Dry	2.17	109.42
	92SLs10a	Soils	.52 Dry	0.539 Dry	1.4	103.65
Mn	92SLs08b	Soils	1040.45 Dry	803.8 Dry	204.01	77.26
	92SLs10a	Soils	706.29 Dry	703 Dry	56.5	99.53
Ni	92SLs08b	Soils	312.14 Dry	264.33 Dry	62.43	84.68
	92SLs10a	Soils	211.89 Dry	194.58 Dry	42.38	91.83
Pb	92SLs08b	Soils	18.34 Dry	15.62 Dry	3.67	85.17
	92SLs10a	Soils	14.13 Dry	13.27 Dry	2.83	93.91
Se	92SLs08b	Soils	83.24 Dry	68.74 Dry	54.05	82.58
	92SLs10a	Soils	56.5 Dry	52.56 Dry	22.87	93.03
Zn	92SLs08b	Soils	416.18 Dry	420 Dry	62.12	100.92
	92SLs10a	Soils	282.52 Dry	314.5 Dry	12.34	111.32

* For a spike to be a valid measure of method accuracy, this ratio must be higher than 1.0.

St. Lazaria Island Samples

Organics

QAQC

PROCEDURAL BLANKS

Analyte	Lab Sample Number	Result Total UG
1,2,5,6-dibenzanthracene	Q4469P	0
1,2,5,6-dibenzanthracene	Q4767P	0
1,2,5,6-dibenzanthracene	Q4769P	0
1,2,5,6-dibenzanthracene	Q4778P	0
1,2,5,6-dibenzanthracene	Q4779P	0
1,2-benzanthracene	Q4469P	0
	Q4767P	0
	Q4769P	0
	Q4778P	0
	Q4779P	0
1,6,7-Trimethyl-naphthalene	Q4469P	0
1,6,7-Trimethyl-naphthalene	Q4767P	0
1,6,7-Trimethyl-naphthalene	Q4769P	< .0001
1,6,7-Trimethyl-naphthalene	Q4778P	< .0001
1,6,7-Trimethyl-naphthalene	Q4779P	0
Aldrin	Q4469P	< .001
	Q4767P	< .001
	Q4769P	0
	Q4778P	0
	Q4779P	< .001
C1-Fluoranthenes & Pyrenes	Q4469P	0
C1-Fluoranthenes & Pyrenes	Q4767P	0
C1-Fluoranthenes & Pyrenes	Q4769P	0
C1-Fluoranthenes & Pyrenes	Q4778P	0
C1-Fluoranthenes & Pyrenes	Q4779P	0
C1-Phenanthrenes & Anthracenes	Q4469P	0
C1-Phenanthrenes & Anthracenes	Q4767P	0
C1-Phenanthrenes & Anthracenes	Q4769P	0
C1-Phenanthrenes & Anthracenes	Q4778P	0
C1-Phenanthrenes & Anthracenes	Q4779P	0
C1-chrysenes	Q4469P	0
	Q4767P	0
	Q4769P	0
	Q4778P	0
	Q4779P	0
C1-dibenzothiophenes	Q4469P	0
C1-dibenzothiophenes	Q4767P	0
C1-dibenzothiophenes	Q4769P	0
C1-dibenzothiophenes	Q4778P	0
C1-dibenzothiophenes	Q4779P	0
C1-fluorenes	Q4469P	0
	Q4767P	0
	Q4769P	0

St. Lazaria Island Samples

Organics

QAQC

PROCEDURAL BLANKS (Cont.)

Analyte	Lab Sample Number	Result Total UG
C1-fluorenes	Q4778P	0
	Q4779P	0
C1-naphthalenes	Q4469P	.0001
	Q4767P	< .0001
	Q4769P	.0001
	Q4778P	.0001
	Q4779P	.0001
C2-Phenanthrenes & Anthracenes	Q4469P	0
C2-Phenanthrenes & Anthracenes	Q4767P	0
C2-Phenanthrenes & Anthracenes	Q4769P	0
C2-Phenanthrenes & Anthracenes	Q4778P	0
C2-Phenanthrenes & Anthracenes	Q4779P	0
C2-chrysenes	Q4469P	0
	Q4767P	0
	Q4769P	0
	Q4778P	0
	Q4779P	0
C2-dibenzothiophenes	Q4469P	0
C2-dibenzothiophenes	Q4767P	0
C2-dibenzothiophenes	Q4769P	0
C2-dibenzothiophenes	Q4778P	0
C2-dibenzothiophenes	Q4779P	0
C2-fluorenes	Q4469P	0
C2-fluorenes	Q4767P	0
	Q4769P	0
	Q4778P	0
	Q4779P	0
C2-naphthalenes	Q4469P	0
	Q4767P	0
	Q4769P	0
	Q4778P	0
	Q4779P	0
C3-Phenanthrenes & Anthracenes	Q4469P	0
C3-Phenanthrenes & Anthracenes	Q4767P	0
C3-Phenanthrenes & Anthracenes	Q4769P	0
C3-Phenanthrenes & Anthracenes	Q4778P	0
C3-Phenanthrenes & Anthracenes	Q4779P	0
C3-chrysenes	Q4469P	0
	Q4767P	0
	Q4769P	0
	Q4778P	0
	Q4779P	0
C3-dibenzothiophenes	Q4469P	0
C3-dibenzothiophenes	Q4767P	0
C3-dibenzothiophenes	Q4769P	0
C3-dibenzothiophenes	Q4778P	0
C3-dibenzothiophenes	Q4779P	0

PROCEDURAL BLANKS (Cont.)

Analyte	Lab Sample Number	Result Total UG
C3-fluorenes	Q4469P	0
	Q4767P	0
	Q4769P	0
	Q4778P	0
	Q4779P	0
C3-naphthalenes	Q4469P	0
	Q4767P	0
	Q4769P	0
	Q4778P	0
	Q4779P	0
C4-Phenanthrenes & Anthracenes	Q4469P	0
C4-Phenanthrenes & Anthracenes	Q4767P	0
C4-Phenanthrenes & Anthracenes	Q4769P	0
C4-Phenanthrenes & Anthracenes	Q4778P	0
C4-Phenanthrenes & Anthracenes	Q4779P	0
C4-chrysenes	Q4469P	0
	Q4767P	0
	Q4769P	0
	Q4778P	0
	Q4779P	0
C4-naphthalenes	Q4469P	0
	Q4767P	0
	Q4769P	0
	Q4778P	0
	Q4779P	0
HCB	Q4469P	0
HCB	Q4767P	0
	Q4769P	0
	Q4778P	0
	Q4779P	0
Heptachlor	Q4469P	0
	Q4767P	0
	Q4769P	0
	Q4778P	0
	Q4779P	0
PCB-TOTAL	Q4469P	0
	Q4767P	0
	Q4769P	0
	Q4778P	0
	Q4779P	0
acenaphthalene	Q4469P	0
	Q4767P	0
	Q4769P	0
	Q4778P	0
	Q4779P	0
acenaphthene	Q4469P	0
	Q4767P	0
	Q4769P	0
	Q4778P	0
	Q4779P	0
alpha BHC	Q4469P	0
	Q4767P	0
	Q4769P	0
	Q4778P	0
	Q4779P	0
alpha chlordane	Q4469P	0

PROCEDURAL BLANKS (Cont.)

Analyte	Lab Sample Number	Result Total UG
alpha chlordane	Q4767P	0
	Q4769P	0
	Q4778P	0
	Q4779P	0
anthracene	Q4469P	0
	Q4767P	0
	Q4769P	0
	Q4778P	0
	Q4779P	0
benzo(a)pyrene	Q4469P	0
	Q4767P	0
	Q4769P	0
	Q4778P	0
	Q4779P	0
benzo(b)fluoranthene	Q4469P	0
benzo(b)fluoranthene	Q4767P	0
benzo(b)fluoranthene	Q4769P	0
benzo(b)fluoranthene	Q4778P	0
benzo(b)fluoranthene	Q4779P	0
benzo(e)pyrene	Q4469P	0
	Q4767P	0
	Q4769P	0
	Q4778P	0
	Q4779P	0
benzo(g,h,i)perylene	Q4469P	0
benzo(g,h,i)perylene	Q4767P	0
benzo(g,h,i)perylene	Q4769P	0
benzo(g,h,i)perylene	Q4778P	0
benzo(g,h,i)perylene	Q4779P	0
benzo(k)fluoranthene	Q4469P	0
benzo(k)fluoranthene	Q4767P	0
benzo(k)fluoranthene	Q4769P	0
benzo(k)fluoranthene	Q4778P	0
benzo(k)fluoranthene	Q4779P	0
beta BHC	Q4469P	0
	Q4767P	0
	Q4769P	0
	Q4778P	0
	Q4779P	0
biphenyl	Q4469P	0
	Q4767P	0
	Q4769P	< .0001
	Q4778P	0
	Q4779P	0
chrysene	Q4469P	0
	Q4767P	0
	Q4769P	0
	Q4778P	0
	Q4779P	0
cis-nonachlor	Q4469P	0

PROCEDURAL BLANKS (Cont.)

Analyte	Lab Sample Number	Result Total UG
cis-nonachlor	Q4767P	0
	Q4769P	0
	Q4778P	0
	Q4779P	0
delta BHC	Q4469P	0
	Q4767P	0
	Q4769P	0
	Q4778P	0
	Q4779P	0
dibenzothiophene	Q4469P	0
	Q4767P	0
	Q4769P	0
	Q4778P	0
	Q4779P	0
dieldrin	Q4469P	0
	Q4767P	0
	Q4769P	0
	Q4778P	0
	Q4779P	0
endrin	Q4469P	0
	Q4767P	0
	Q4769P	0
	Q4778P	0
	Q4779P	0
fluoranthene	Q4469P	0
	Q4767P	0
	Q4769P	0
	Q4778P	0
	Q4779P	0
fluorene	Q4469P	0
fluorene	Q4767P	0
	Q4769P	0
	Q4778P	< .0001
	Q4779P	0
gamma BHC	Q4469P	0
	Q4767P	0
	Q4769P	0
	Q4778P	0
	Q4779P	0
gamma chlordane	Q4469P	0
	Q4767P	0
	Q4769P	0
	Q4778P	0
	Q4779P	0
heptachlor epoxide	Q4469P	0
	Q4767P	0
	Q4769P	0
	Q4778P	0
	Q4779P	0
indeno(1,2,3-cd)pyrene	Q4469P	0
indeno(1,2,3-cd)pyrene	Q4767P	0
indeno(1,2,3-cd)pyrene	Q4769P	0
indeno(1,2,3-cd)pyrene	Q4778P	0
indeno(1,2,3-cd)pyrene	Q4779P	0
mirex	Q4469P	0
	Q4767P	0
	Q4769P	0

PROCEDURAL BLANKS (Cont.)

Analyte	Lab Sample Number	Result Total UG
mirex	Q4778P	0
	Q4779P	0
n-decane	Q4469P	.0001
	Q4767P	0
	Q4769P	0
	Q4778P	.0001
	Q4779P	.0002
n-docosane	Q4469P	.0001
	Q4767P	.0001
	Q4769P	.0001
	Q4778P	.0001
	Q4779P	.0001
n-dodecane	Q4469P	0
	Q4767P	0
	Q4769P	.0001
	Q4778P	.0002
	Q4779P	0
n-dotriacontane	Q4469P	.0001
	Q4767P	0
	Q4769P	.0001
	Q4778P	0
	Q4779P	0
n-eicosane	Q4469P	.0003
	Q4767P	0
	Q4769P	.0001
	Q4778P	.0001
	Q4779P	0
n-heneicosane	Q4469P	.0005
	Q4767P	0
	Q4769P	.0001
n-heneicosane	Q4778P	.0001
	Q4779P	0
n-hentriacontane	Q4469P	.0003
	Q4767P	.0006
	Q4769P	.0002
	Q4778P	.0001
	Q4779P	.0003
n-heptacosane	Q4469P	.0001
	Q4767P	.0001
	Q4769P	.0001
	Q4778P	.0001
	Q4779P	.0001
n-heptadecane	Q4469P	0
	Q4767P	0
	Q4769P	.0001
	Q4778P	0
	Q4779P	0
n-hexacosane	Q4469P	0
	Q4767P	0
	Q4769P	.0001
	Q4778P	0
	Q4779P	.0001
n-hexadecane	Q4469P	0
	Q4767P	0
	Q4769P	.0001
	Q4778P	.0001
	Q4779P	0
n-nonacosane	Q4469P	0
	Q4767P	.0001
	Q4769P	.0002

PROCEDURAL BLANKS (Cont.)

Analyte	Lab Sample Number	Result Total UG
n-nonacosane	Q4778P	.0002
	Q4779P	.0001
n-nonadecane	Q4469P	0
	Q4767P	.0001
	Q4769P	.0002
	Q4778P	.0001
	Q4779P	.0001
n-octacosane	Q4469P	.0002
	Q4767P	0
	Q4769P	.0002
	Q4778P	0
	Q4779P	0
n-octadecane	Q4469P	.0001
	Q4767P	0
	Q4769P	.0001
	Q4778P	0
	Q4779P	0
n-pentacosane	Q4469P	.0001
	Q4767P	.0001
	Q4769P	.0001
	Q4778P	.0001
	Q4779P	.0001
n-pentadecane	Q4469P	0
	Q4767P	0
	Q4769P	.0001
	Q4778P	0
	Q4779P	0
n-tetracosane	Q4469P	.0002
	Q4767P	.0003
	Q4769P	.0003
n-tetracosane	Q4778P	.0002
	Q4779P	.0001
n-tetradecane	Q4469P	.0001
	Q4767P	0
	Q4769P	0
	Q4778P	0
	Q4779P	0
n-tetratriacontane	Q4469P	0
	Q4767P	.0003
	Q4769P	0
	Q4778P	.0002
	Q4779P	.0002
n-triacontane	Q4469P	.0002
	Q4767P	.0006
	Q4769P	.0002
	Q4778P	.0002
	Q4779P	.0001
n-tricosane	Q4469P	.0003
	Q4767P	.0004
	Q4769P	.0001
	Q4778P	.0001
	Q4779P	.0001
n-tridecane	Q4469P	0
	Q4767P	0
	Q4769P	0
	Q4778P	0
	Q4779P	0
n-tritriacontane	Q4469P	0
	Q4767P	0
	Q4769P	0

PROCEDURAL BLANKS (Cont.)

Analyte	Lab Sample Number	Result Total UG
n-tritriacontane	Q4778P	0
	Q4779P	0
n-undecane	Q4469P	0
	Q4767P	0
	Q4769P	.0003
	Q4778P	.0001
	Q4779P	0
naphthalene	Q4469P	0
	Q4767P	< .0001
	Q4769P	< .0001
	Q4778P	< .0001
	Q4779P	< .0001
o,p'-DDD	Q4469P	0
	Q4767P	0
	Q4769P	0
	Q4778P	0
	Q4779P	0
o,p'-DDE	Q4469P	0
	Q4767P	0
	Q4769P	0
	Q4778P	0
	Q4779P	0
o,p'-DDT	Q4469P	0
	Q4767P	0
	Q4769P	0
	Q4778P	0
	Q4779P	0
oxychlordane	Q4469P	0
	Q4767P	0
	Q4769P	0
oxychlordane	Q4778P	0
	Q4779P	0
p,p'-DDD	Q4469P	0
	Q4767P	0
	Q4769P	0
	Q4778P	0
	Q4779P	0
p,p'-DDE	Q4469P	0
	Q4767P	0
	Q4769P	0
	Q4778P	0
	Q4779P	0
p,p'-DDT	Q4469P	0
	Q4767P	0
	Q4769P	0
	Q4778P	0
	Q4779P	0
perylene	Q4469P	0
	Q4767P	< .0001
	Q4769P	0
	Q4778P	0
	Q4779P	< .0001
phenanthrene	Q4469P	0
	Q4767P	0
	Q4769P	.0001
	Q4778P	< .0001
	Q4779P	0
phytane	Q4469P	.0001
	Q4767P	0
	Q4769P	0

PROCEDURAL BLANKS (Cont.)

Analyte	Lab Sample Number	Result Total UG
phytane	Q4778P	0
	Q4779P	0
pristane	Q4469P	0
	Q4767P	0
	Q4769P	.0008
	Q4778P	.0008
	Q4779P	0
pyrene	Q4469P	0
	Q4767P	0
	Q4769P	0
	Q4778P	0
	Q4779P	0
toxaphene	Q4469P	0
	Q4767P	0
	Q4769P	0
	Q4778P	0
	Q4779P	0
trans-nonachlor	Q4469P	0
	Q4767P	0
	Q4769P	0
	Q4778P	0
	Q4779P	0
unresolved complex mixture	Q4469P	0
unresolved complex mixture	Q4767P	0
unresolved complex mixture	Q4769P	0
unresolved complex mixture	Q4778P	0
unresolved complex mixture	Q4779P	0

DUPLICATES

Analyte	Sample Number	Sample Matrix	Initial Result (ppm / %)		Duplicate Result (ppm / %)		Average	Relative % Difference
% Moisture	92SLm03	Invertebrate	82.94	%	82.4	%	82.67	0.65
	92SLs02b	Soils	78.7	%	78.7	%	78.7	0
	92SLs07b	Soils	77.48	%	77.48	%	77.48	0
1,2,5,6-dibenzanthracene								
	92SLm03	Invertebrate	< .00625	Wet	< .00471698	Wet	0.002742	27.96
	92SLs02b	Soils	.01455399	Dry	< .00861438	Dry	0.009431	108.65
	92SLs07b	Soils	< .00917458	Dry	< .00961147	Dry	0.004697	4.65
1,2-benzanthracene								
	92SLm03	Invertebrate	< .00625	Wet	< .00471698	Wet	0.002742	27.96
	92SLs02b	Soils	< .00833896	Dry	< .00861438	Dry	0.004238	3.25
	92SLs07b	Soils	< .00917458	Dry	< .00961147	Dry	0.004697	4.65
1,6,7-Trimethyl-naphthalene								
	92SLm03	Invertebrate	.00664	Wet	.00628	Wet	0.00646	5.57
	92SLs02b	Soils	.03051643	Dry	.03553991	Dry	0.033028	15.21
	92SLs07b	Soils	< .00917458	Dry	< .00961147	Dry	0.004697	4.65
Aldrin	92SLm03	Invertebrate	< .047416	Wet	< .047281	Wet	0.023674	0.29
	92SLs02b	Soils	< .08339	Dry	< .0724507	Dry	0.03896	14.04
	92SLs07b	Soils	< .091746	Dry	< .0961146	Dry	0.046965	4.65
C1-Fluoranthenes & Pyrenes								
	92SLm03	Invertebrate	< .00625	Wet	< .00471698	Wet	0.002742	27.96
	92SLs02b	Soils	< .00833896	Dry	< .00861438	Dry	0.004238	3.25
	92SLs07b	Soils	< .00917458	Dry	< .00961147	Dry	0.004697	4.65
C1-Phenanthrenes & Anthracenes								
	92SLm03	Invertebrate	< .00625	Wet	< .00471698	Wet	0.002742	27.96
	92SLs02b	Soils	.05408451	Dry	.042723	Dry	0.048404	23.47
	92SLs07b	Soils	.01150089	Dry	< .00961147	Dry	0.008153	82.12
C1-chrysenes	92SLm03	Invertebrate	< .00625	Wet	< .00471698	Wet	0.002742	27.96
C1-chrysenes	92SLs02b	Soils	< .00833896	Dry	< .00861438	Dry	0.004238	3.25
	92SLs07b	Soils	< .00917458	Dry	< .00961147	Dry	0.004697	4.65
C1-dibenzothiophenes								
	92SLm03	Invertebrate	< .00625	Wet	< .00471698	Wet	0.002742	27.96
	92SLs02b	Soils	.0313615	Dry	.02211268	Dry	0.026737	34.59
	92SLs07b	Soils	< .00917458	Dry	< .00961147	Dry	0.004697	4.65
C1-fluorenes	92SLm03	Invertebrate	< .00625	Wet	< .00471698	Wet	0.002742	27.96
	92SLs02b	Soils	< .00833896	Dry	.02586854	Dry	0.015019	144.48
	92SLs07b	Soils	< .00917458	Dry	< .00961147	Dry	0.004697	4.65
C1-naphthalenes	92SLm03	Invertebrate	.01177	Wet	.00931	Wet	0.01054	23.34
	92SLs02b	Soils	.13384977	Dry	.08126761	Dry	0.107559	48.89
	92SLs07b	Soils	.03325933	Dry	.03015098	Dry	0.031705	9.8
C2-Phenanthrenes & Anthracenes								
	92SLm03	Invertebrate	< .00625	Wet	< .00471698	Wet	0.002742	27.96
	92SLs02b	Soils	.13737089	Dry	.1286385	Dry	0.133005	6.57
	92SLs07b	Soils	.03050622	Dry	< .00961147	Dry	0.017656	145.56
C2-chrysenes	92SLm03	Invertebrate	< .00625	Wet	< .00471698	Wet	0.002742	27.96
	92SLs02b	Soils	< .00833896	Dry	< .00861438	Dry	0.004238	3.25
	92SLs07b	Soils	< .00917458	Dry	< .00961147	Dry	0.004697	4.65
C2-dibenzothiophenes								
	92SLm03	Invertebrate	< .00625	Wet	< .00471698	Wet	0.002742	27.96
	92SLs02b	Soils	.05985915	Dry	.05699531	Dry	0.058427	4.9
	92SLs07b	Soils	.01243339	Dry	< .00961147	Dry	0.00862	88.49
C2-fluorenes	92SLm03	Invertebrate	< .00625	Wet	< .00471698	Wet	0.002742	27.96
	92SLs02b	Soils	< .00833896	Dry	< .00861438	Dry	0.004238	3.25
	92SLs07b	Soils	< .00917458	Dry	< .00961147	Dry	0.004697	4.65
C2-naphthalenes	92SLm03	Invertebrate	< .00625	Wet	< .00471698	Wet	0.002742	27.96

DUPLICATES (Cont.)

Analyte	Sample Number	Sample Matrix	Initial Result (ppm / %)	Duplicate Result (ppm / %)	Average	Relative % Difference
C2-naphthalenes	92SLs02b	Soils	.16591549 Dry	.1241784 Dry	0.145047	28.77
	92SLs07b	Soils	.0312167 Dry	.0410746 Dry	0.036146	27.27
C3-Phenanthrenes & Anthracenes						
	92SLm03	Invertebrate	< .00625 Wet	< .00471698 Wet	0.002742	27.96
	92SLs02b	Soils	.10483568 Dry	.09309859 Dry	0.098967	11.86
	92SLs07b	Soils	.03290409 Dry	< .00961147 Dry	0.018855	149.02
C3-chrysenes	92SLm03	Invertebrate	< .00625 Wet	< .00471698 Wet	0.002742	27.96
	92SLs02b	Soils	< .00833896 Dry	< .00861438 Dry	0.004238	5.25
	92SLs07b	Soils	< .00917458 Dry	< .00961147 Dry	0.004697	4.65
C3-dibenzothiophenes						
	92SLm03	Invertebrate	< .00625 Wet	< .00471698 Wet	0.002742	27.96
	92SLs02b	Soils	.06760563 Dry	.05544601 Dry	0.061526	19.76
	92SLs07b	Soils	< .00917458 Dry	< .00961147 Dry	0.004697	4.65
C3-fluorenes	92SLm03	Invertebrate	< .00625 Wet	< .00471698 Wet	0.002742	27.96
	92SLs02b	Soils	< .00833896 Dry	< .00861438 Dry	0.004238	5.25
	92SLs07b	Soils	< .00917458 Dry	< .00961147 Dry	0.004697	4.65
C3-naphthalenes	92SLm03	Invertebrate	< .00625 Wet	< .00471698 Wet	0.002742	27.96
	92SLs02b	Soils	.19774648 Dry	.2186385 Dry	0.208192	10.03
	92SLs07b	Soils	.06092362 Dry	.05630551 Dry	0.058615	7.88
C4-Phenanthrenes & Anthracenes						
	92SLm03	Invertebrate	< .00625 Wet	< .00471698 Wet	0.002742	27.96
	92SLs02b	Soils	< .00833896 Dry	< .00861438 Dry	0.004238	5.25
	92SLs07b	Soils	< .00917458 Dry	< .00961147 Dry	0.004697	4.65
C4-chrysenes	92SLm03	Invertebrate	< .00625 Wet	< .00471698 Wet	0.002742	27.96
	92SLs02b	Soils	< .00833896 Dry	< .00861438 Dry	0.004238	5.25
	92SLs07b	Soils	< .00917458 Dry	< .00961147 Dry	0.004697	4.65
C4-naphthalenes	92SLm03	Invertebrate	< .00625 Wet	< .00471698 Wet	0.002742	27.96
C4-naphthalenes	92SLs02b	Soils	.26305164 Dry	.25535211 Dry	0.259202	2.97
	92SLs07b	Soils	< .00917458 Dry	< .00961147 Dry	0.004697	4.65
HCB	92SLm03	Invertebrate	< .047416 Wet	< .047281 Wet	0.023674	0.29
	92SLs02b	Soils	< .08339 Dry	< .0724507 Dry	0.03896	14.04
	92SLs07b	Soils	< .091746 Dry	< .0961146 Dry	0.046965	4.65
Heptachlor	92SLm03	Invertebrate	< .047416 Wet	< .047281 Wet	0.023674	0.29
	92SLs02b	Soils	< .08339 Dry	< .0724507 Dry	0.03896	14.04
	92SLs07b	Soils	< .091746 Dry	< .0961146 Dry	0.046965	4.65
PCB-TOTAL	92SLm03	Invertebrate	< .047416 Wet	< .047281 Wet	0.023674	0.29
	92SLs02b	Soils	< .08339 Dry	< .0724507 Dry	0.03896	14.04
	92SLs07b	Soils	.17762 Dry	< .0961146 Dry	0.112839	114.82
acenaphthalene	92SLm03	Invertebrate	< .00625 Wet	< .00471698 Wet	0.002742	27.96
	92SLs02b	Soils	.01173709 Dry	< .00861438 Dry	0.008022	92.62
	92SLs07b	Soils	< .00917458 Dry	< .00961147 Dry	0.004697	4.65
acenaphthene	92SLm03	Invertebrate	< .00625 Wet	< .00471698 Wet	0.002742	27.96
	92SLs02b	Soils	.01089202 Dry	.01150235 Dry	0.011197	5.45
	92SLs07b	Soils	< .00917458 Dry	< .00961147 Dry	0.004697	4.65
alpha BHC	92SLm03	Invertebrate	< .047416 Wet	< .047281 Wet	0.023674	0.29
	92SLs02b	Soils	< .08339 Dry	< .0724507 Dry	0.03896	14.04
	92SLs07b	Soils	< .091746 Dry	< .0961146 Dry	0.046965	4.65
alpha chlordane	92SLm03	Invertebrate	< .047416 Wet	< .047281 Wet	0.023674	0.29
	92SLs02b	Soils	< .08339 Dry	< .0724507 Dry	0.03896	14.04
	92SLs07b	Soils	< .091746 Dry	< .0961146 Dry	0.046965	4.65
anthracene	92SLm03	Invertebrate	< .00625 Wet	< .00471698 Wet	0.002742	27.96
	92SLs02b	Soils	< .00833896 Dry	< .00861438 Dry	0.004238	5.25
	92SLs07b	Soils	< .00917458 Dry	< .00961147 Dry	0.004697	4.65

DUPLICATES (Cont.)

Analyte	Sample Number	Sample Matrix	Initial Result (ppm / %)		Duplicate Result (ppm / %)		Average	Relative % Difference
benzo(a)pyrene	92SLm03	Invertebrate	< .00625	Wet	< .00471698	Wet	0.002742	27.96
	92SLs02b	Soils	< .00833896	Dry	< .00861438	Dry	0.004238	3.25
	92SLs07b	Soils	< .00917458	Dry	< .00961147	Dry	0.004697	4.65
benzo(b)fluoranthene								
	92SLm03	Invertebrate	< .00625	Wet	< .00471698	Wet	0.002742	27.96
	92SLs02b	Soils	< .00833896	Dry	< .00861438	Dry	0.004238	3.25
	92SLs07b	Soils	< .00917458	Dry	< .00961147	Dry	0.004697	4.65
benzo(e)pyrene	92SLm03	Invertebrate	< .00625	Wet	< .00471698	Wet	0.002742	27.96
	92SLs02b	Soils	< .00833896	Dry	< .00861438	Dry	0.004238	3.25
	92SLs07b	Soils	< .00917458	Dry	< .00961147	Dry	0.004697	4.65
benzo(g,h,i)perylene								
	92SLm03	Invertebrate	< .00625	Wet	< .00471698	Wet	0.002742	27.96
	92SLs02b	Soils	< .00833896	Dry	< .00861438	Dry	0.004238	3.25
	92SLs07b	Soils	< .00917458	Dry	< .00961147	Dry	0.004697	4.65
benzo(k)fluoranthene								
	92SLm03	Invertebrate	< .00625	Wet	< .00471698	Wet	0.002742	27.96
	92SLs02b	Soils	< .00833896	Dry	< .00861438	Dry	0.004238	3.25
	92SLs07b	Soils	< .00917458	Dry	< .00961147	Dry	0.004697	4.65
beta BHC	92SLm03	Invertebrate	< .047416	Wet	< .047281	Wet	0.023674	0.29
	92SLs02b	Soils	< .08339	Dry	< .0724507	Dry	0.03896	14.04
	92SLs07b	Soils	< .091746	Dry	< .0961146	Dry	0.046965	4.65
biphenyl	92SLm03	Invertebrate	< .00625	Wet	< .00471698	Wet	0.002742	27.96
	92SLs02b	Soils	.0286385	Dry	.02375587	Dry	0.026197	18.64
	92SLs07b	Soils	< .00917458	Dry	< .00961147	Dry	0.004697	4.65
chrysene	92SLm03	Invertebrate	< .00625	Wet	< .00471698	Wet	0.002742	27.96
	92SLs02b	Soils	< .00833896	Dry	.01384977	Dry	0.00901	107.44
	92SLs07b	Soils	< .00917458	Dry	< .00961147	Dry	0.004697	4.65
cis-nonachlor	92SLm03	Invertebrate	< .047416	Wet	< .047281	Wet	0.023674	0.29
	92SLs02b	Soils	< .08339	Dry	< .0724507	Dry	0.03896	14.04
	92SLs07b	Soils	< .091746	Dry	< .0961146	Dry	0.046965	4.65
delta BHC	92SLm03	Invertebrate	< .047416	Wet	< .047281	Wet	0.023674	0.29
	92SLs02b	Soils	< .08339	Dry	< .0724507	Dry	0.03896	14.04
	92SLs07b	Soils	< .091746	Dry	< .0961146	Dry	0.046965	4.65
dibenzothiophene	92SLm03	Invertebrate	< .00625	Wet	< .00471698	Wet	0.002742	27.96
	92SLs02b	Soils	.0128169	Dry	< .00861438	Dry	0.008562	99.39
	92SLs07b	Soils	< .00917458	Dry	< .00961147	Dry	0.004697	4.65
dieldrin	92SLm03	Invertebrate	< .047416	Wet	< .047281	Wet	0.023674	0.29
	92SLs02b	Soils	< .08339	Dry	< .0724507	Dry	0.03896	14.04
	92SLs07b	Soils	< .091746	Dry	< .0961146	Dry	0.046965	4.65
endrin	92SLm03	Invertebrate	< .047416	Wet	< .047281	Wet	0.023674	0.29
	92SLs02b	Soils	< .08339	Dry	< .0724507	Dry	0.03896	14.04
	92SLs07b	Soils	< .091746	Dry	< .0961146	Dry	0.046965	4.65
fluoranthene	92SLm03	Invertebrate	< .00625	Wet	< .00471698	Wet	0.002742	27.96
	92SLs02b	Soils	.00920188	Dry	.01070423	Dry	0.009953	15.09
	92SLs07b	Soils	< .00917458	Dry	< .00961147	Dry	0.004697	4.65
fluorene	92SLm03	Invertebrate	< .00625	Wet	< .00471698	Wet	0.002742	27.96
	92SLs02b	Soils	.00906103	Dry	.00929577	Dry	0.009178	2.56
	92SLs07b	Soils	< .00917458	Dry	< .00961147	Dry	0.004697	4.65
gamma BHC	92SLm03	Invertebrate	< .047416	Wet	< .047281	Wet	0.023674	0.29
	92SLs02b	Soils	< .08339	Dry	< .0724507	Dry	0.03896	14.04
	92SLs07b	Soils	< .091746	Dry	< .0961146	Dry	0.046965	4.65
gamma chlordane	92SLm03	Invertebrate	< .047416	Wet	< .047281	Wet	0.023674	0.29
	92SLs02b	Soils	< .08339	Dry	< .0724507	Dry	0.03896	14.04

DUPLICATES (Cont.)

Analyte	Sample Number	Sample Matrix	Initial Result (ppm / %)	Duplicate Result (ppm / %)	Average	Relative % Difference
gamma chlordane	92SLs07b	Soils	< .091746 Dry	< .0961146 Dry	0.046965	4.65
heptachlor epoxide						
	92SLm03	Invertebrate	< .047416 Wet	< .047281 Wet	0.023674	0.29
	92SLs02b	Soils	< .08339 Dry	< .0724507 Dry	0.03896	14.04
	92SLs07b	Soils	< .091746 Dry	< .0961146 Dry	0.046965	4.65
indeno(1,2,3-cd)pyrene						
	92SLm03	Invertebrate	< .00625 Wet	< .00471698 Wet	0.002742	27.96
	92SLs02b	Soils	< .00833896 Dry	< .00861438 Dry	0.004238	3.25
	92SLs07b	Soils	< .00917458 Dry	< .00961147 Dry	0.004697	4.65
mirex	92SLm03	Invertebrate	< .047416 Wet	< .047281 Wet	0.023674	0.29
	92SLs02b	Soils	< .08339 Dry	< .0724507 Dry	0.03896	14.04
	92SLs07b	Soils	< .091746 Dry	< .0961146 Dry	0.046965	4.65
n-decane	92SLs02b	Soils	.11267606 Dry	.10328638 Dry	0.107981	8.7
	92SLs07b	Soils	.09769094 Dry	.07992895 Dry	0.08881	20
n-docosane	92SLs02b	Soils	.07042254 Dry	.12206573 Dry	0.096244	53.66
	92SLs07b	Soils	.08880995 Dry	.09769094 Dry	0.09325	9.52
n-dodecane	92SLs02b	Soils	.02816901 Dry	.54460094 Dry	0.286385	180.33
	92SLs07b	Soils	.03108348 Dry	.03108348 Dry	0.031083	0
n-dotriacontane	92SLs02b	Soils	8.04694836 Dry	9.48356808 Dry	8.765258	16.39
	92SLs07b	Soils	4.40053286 Dry	5.09325044 Dry	4.746892	14.59
n-eicosane	92SLs02b	Soils	.03286385 Dry	.03755869 Dry	0.035211	13.33
	92SLs07b	Soils	.03108348 Dry	.09769094 Dry	0.064387	103.45
n-heneicosane	92SLs02b	Soils	.342723 Dry	.44600939 Dry	0.394366	26.19
	92SLs07b	Soils	.22646536 Dry	.23978686 Dry	0.233126	5.71
n-hentriacontane	92SLs02b	Soils	7.73239437 Dry	9.21596244 Dry	8.474178	17.51
n-hentriacontane	92SLs07b	Soils	3.72557726 Dry	4.169627 Dry	3.947602	11.25
n-heptacosane	92SLs02b	Soils	2.47887324 Dry	2.86384977 Dry	2.671362	14.41
	92SLs07b	Soils	1.88277087 Dry	2.13587922 Dry	2.009325	12.6
n-heptadecane	92SLs02b	Soils	.02347418 Dry	.02347418 Dry	0.023474	0
	92SLs07b	Soils	.03552398 Dry	.04440497 Dry	0.039964	22.22
n-hexacosane	92SLs02b	Soils	.21126761 Dry	.23943662 Dry	0.225352	12.5
	92SLs07b	Soils	.19094139 Dry	.20870337 Dry	0.199822	8.89
n-hexadecane	92SLs02b	Soils	.02816901 Dry	.03286385 Dry	0.030516	15.38
	92SLs07b	Soils	.02664298 Dry	.03552398 Dry	0.031083	28.57
n-nonacosane	92SLs02b	Soils	9.62441315 Dry	11.48356808 Dry	10.553991	17.62
	92SLs07b	Soils	5.40852575 Dry	6.07460036 Dry	5.741563	11.6
n-nonadecane	92SLs02b	Soils	.03755869 Dry	.04225352 Dry	0.039906	11.76
	92SLs07b	Soils	.04884547 Dry	.07548845 Dry	0.062167	42.86
n-octacosane	92SLs02b	Soils	.4600939 Dry	.51643192 Dry	0.488263	11.54
	92SLs07b	Soils	.35079929 Dry	.38188277 Dry	0.366341	8.48
n-octadecane	92SLs02b	Soils	.01408451 Dry	.01408451 Dry	0.014085	0
	92SLs07b	Soils	.01776199 Dry	.02220249 Dry	0.019982	22.22
n-pentacosane	92SLs02b	Soils	.69953052 Dry	.87323944 Dry	0.786385	22.09
	92SLs07b	Soils	.69271758 Dry	.74156306 Dry	0.71714	6.81
n-pentadecane	92SLs02b	Soils	.01408451 Dry	.19248826 Dry	0.103286	172.73
	92SLs07b	Soils	.34191829 Dry	.37300178 Dry	0.35746	8.7
n-tetracosane	92SLs02b	Soils	.08450704 Dry	.12676056 Dry	0.105634	40
	92SLs07b	Soils	.10213144 Dry	.12433393 Dry	0.113233	19.61

DUPLICATES (Cont.)

Analyte	Sample Number	Sample Matrix	Initial Result (ppm / %)		Duplicate Result (ppm / %)		Average	Relative % Difference
n-tetradecane	92SLs02b	Soils	.05164319	Dry	.0657277	Dry	0.058685	24
	92SLs07b	Soils	.03996448	Dry	.03552398	Dry	0.037744	11.76
n-tetratriacontane	92SLs02b	Soils	.07511737	Dry	.09389671	Dry	0.084507	22.22
	92SLs07b	Soils	.02220249	Dry	.01776199	Dry	0.019982	22.22
n-triacontane	92SLs02b	Soils	.53051643	Dry	.70892019	Dry	0.619718	28.79
	92SLs07b	Soils	.34191829	Dry	.40852575	Dry	0.375222	17.75
n-tricosane	92SLs02b	Soils	.35680751	Dry	.42723005	Dry	0.392019	17.96
	92SLs07b	Soils	.42628774	Dry	.48401421	Dry	0.455151	12.68
n-tridecane	92SLs02b	Soils	< .00833896	Dry	.01877934	Dry	0.011474	77.33
	92SLs07b	Soils	< .00917458	Dry	.01332149	Dry	0.008954	37.54
n-tritriacontane	92SLs02b	Soils	3.96713615	Dry	4.89671362	Dry	4.431925	20.97
	92SLs07b	Soils	1.48756661	Dry	1.6740675	Dry	1.580817	11.8
n-undecane	92SLs02b	Soils	.02347418	Dry	.0657277	Dry	0.044601	94.74
	92SLs07b	Soils	.07992895	Dry	.07104796	Dry	0.075488	11.76
naphthalene	92SLm03	Invertebrate	.00837	Wet	.0086	Wet	0.008485	2.71
	92SLs02b	Soils	.11018779	Dry	.08788732	Dry	0.099038	22.52
	92SLs07b	Soils	.03423623	Dry	.03552398	Dry	0.03488	3.69
o,p'-DDD	92SLm03	Invertebrate	< .047416	Wet	< .047281	Wet	0.023674	0.29
	92SLs02b	Soils	< .08339	Dry	< .0724507	Dry	0.03896	14.04
	92SLs07b	Soils	< .091746	Dry	< .0961146	Dry	0.046965	4.65
o,p'-DDE	92SLm03	Invertebrate	< .047416	Wet	< .047281	Wet	0.023674	0.29
	92SLs02b	Soils	< .08339	Dry	< .0724507	Dry	0.03896	14.04
	92SLs07b	Soils	< .091746	Dry	< .0961146	Dry	0.046965	4.65
o,p'-DDT	92SLm03	Invertebrate	< .047416	Wet	< .047281	Wet	0.023674	0.29
	92SLs02b	Soils	< .08339	Dry	< .0724507	Dry	0.03896	14.04
	92SLs07b	Soils	< .091746	Dry	< .0961146	Dry	0.046965	4.65
oxychlordane	92SLm03	Invertebrate	< .047416	Wet	< .047281	Wet	0.023674	0.29
	92SLs02b	Soils	< .08339	Dry	< .0724507	Dry	0.03896	14.04
	92SLs07b	Soils	< .091746	Dry	< .0961146	Dry	0.046965	4.65
p,p'-DDD	92SLm03	Invertebrate	< .047416	Wet	< .047281	Wet	0.023674	0.29
	92SLs02b	Soils	< .08339	Dry	< .0724507	Dry	0.03896	14.04
	92SLs07b	Soils	< .091746	Dry	< .0961146	Dry	0.046965	4.65
p,p'-DDE	92SLm03	Invertebrate	< .047416	Wet	< .047281	Wet	0.023674	0.29
	92SLs02b	Soils	< .08339	Dry	< .0724507	Dry	0.03896	14.04
	92SLs07b	Soils	< .091746	Dry	< .0961146	Dry	0.046965	4.65
p,p'-DDT	92SLm03	Invertebrate	< .047416	Wet	< .047281	Wet	0.023674	0.29
	92SLs02b	Soils	< .08339	Dry	< .0724507	Dry	0.03896	14.04
	92SLs07b	Soils	< .091746	Dry	< .0961146	Dry	0.046965	4.65
perylene	92SLm03	Invertebrate	< .00625	Wet	< .00471698	Wet	0.002742	27.96
	92SLs02b	Soils	< .00833896	Dry	< .00861438	Dry	0.004238	3.25
	92SLs07b	Soils	< .00917458	Dry	< .00961147	Dry	0.004697	4.65
phenanthrene	92SLm03	Invertebrate	< .00625	Wet	< .00471698	Wet	0.002742	27.96
	92SLs02b	Soils	.02122066	Dry	.01788732	Dry	0.019554	17.05
	92SLs07b	Soils	< .00917458	Dry	< .00961147	Dry	0.004697	4.65
phytane	92SLs02b	Soils	.00938967	Dry	.01877934	Dry	0.014085	66.67
	92SLs07b	Soils	< .00917458	Dry	< .00961147	Dry	0.004697	4.65
pristane	92SLs02b	Soils	.4084507	Dry	.48826291	Dry	0.448357	17.8
	92SLs07b	Soils	.1598579	Dry	.17761989	Dry	0.168739	10.53

DUPLICATES (Cont.)

Analyte	Sample Number	Sample Matrix	Initial Result (ppm / %)		Duplicate Result (ppm / %)		Average	Relative % Difference
pyrene	92SLm03	Invertebrate	< .00625	Wet	< .00471698	Wet	0.002742	27.96
	92SLs02b	Soils	.01032864	Dry	.012723	Dry	0.011526	20.77
	92SLs07b	Soils	< .00917458	Dry	< .00961147	Dry	0.004697	4.65
toxaphene	92SLm03	Invertebrate	< .047416	Wet	< .047281	Wet	0.023674	0.29
	92SLs02b	Soils	< .08339	Dry	< .0724507	Dry	0.03896	14.04
	92SLs07b	Soils	< .091746	Dry	< .0961146	Dry	0.046965	4.65
trans-nonachlor	92SLm03	Invertebrate	< .047416	Wet	< .047281	Wet	0.023674	0.29
	92SLs02b	Soils	< .08339	Dry	< .0724507	Dry	0.03896	14.04
	92SLs07b	Soils	< .091746	Dry	< .0961146	Dry	0.046965	4.65
unresolved complex mixture								
	92SLs02b	Soils	2.81690141	Dry	1.4084507	Dry	2.112676	66.67
	92SLs07b	Soils	17.31793961	Dry	5.3285968	Dry	11.323268	105.88

REFERENCE MATERIALS

Analyte	Lab Sample Number	S.R.M. ID	S.R.M. Name	* Certified Reference Value (ppm / %)	95% Confidence Interval	Result (ppm / %)	Percent Recovery

- NO DATA EXIST FOR THIS SECTION.

SPIKE RECOVERIES

% Recovery	Analyte	Sample Number	Sample Matrix	Spike Level (ppm / %)		Amount Recovered (ppm / %)		* Spike / Background	Percent
	1,2,5,6-dibenzanthracene								
81.9		92SLm03	Invertebrate	.05	Wet	0.04095	Wet	10	
423.32		92SLs02b	Soils	.0685	Dry	0.28997532	Dry	4.71	
83.48		92SLs07b	Soils	.0925	Dry	0.07722025	Dry	10	
75.58	1,2-benzanthracene	92SLm03	Invertebrate	.05	Wet	0.03779	Wet	10	
532.34		92SLs02b	Soils	.0685	Dry	0.36465364	Dry	10	
103.88		92SLs07b	Soils	.0925	Dry	0.09609236	Dry	10	
	1,6,7-Trimethyl-naphthalene								
104.57		92SLm03	Invertebrate	.0569	Wet	0.0595	Wet	8.57	
536.09		92SLs02b	Soils	.078	Dry	0.41815142	Dry	2.56	
91.85		92SLs07b	Soils	.1053	Dry	0.09671403	Dry	11.38	
106.81	Aldrin	92SLm03	Invertebrate	.9175	Wet	0.98	Wet	18.35	
95.04		92SLs02b	Soils	1.4951	Dry	1.4209591	Dry	18.35	
99.4		92SLs07b	Soils	1.6976	Dry	1.687389	Dry	18.35	
97.32	HCB	92SLm03	Invertebrate	1.007	Wet	0.98	Wet	20.14	
56.83		92SLs02b	Soils	1.6408	Dry	0.9325044	Dry	20.14	
30.98		92SLs07b	Soils	1.8632	Dry	0.5772647	Dry	20.14	
98.19	Heptachlor	92SLm03	Invertebrate	.937	Wet	0.92	Wet	18.74	
98.87		92SLs02b	Soils	1.5271	Dry	1.5097691	Dry	18.74	
89.65		92SLs07b	Soils	1.7336	Dry	1.5541741	Dry	18.74	
98.66	acenaphthalene	92SLm03	Invertebrate	.05	Wet	0.04933	Wet	10	
481.11		92SLs02b	Soils	.0685	Dry	0.32955954	Dry	5.84	
80.89		92SLs07b	Soils	.0925	Dry	0.07482238	Dry	10	
113.56	acenaphthene	92SLm03	Invertebrate	.05	Wet	0.05678	Wet	10	
479.1		92SLs02b	Soils	.0685	Dry	0.32818436	Dry	6.29	

* For a spike to be a valid measure of method accuracy, this ratio must be higher than 1.0.

SPIKE RECOVERIES (Cont.)

Analyte	Sample Number	Sample Matrix	Spike Level (ppm / %)	Amount Recovered (ppm / %)	* Spike / Background	Percent Recovery
acenaphthene	92SLs07b	Soils	.0925 Dry	0.07295737 Dry	10	78.87
alpha BHC	92SLm03	Invertebrate	.833 Wet	0.86 Wet	16.66	103.24
	92SLs02b	Soils	1.3575 Dry	1.1101243 Dry	16.66	81.78
	92SLs07b	Soils	1.5413 Dry	1.4209591 Dry	16.66	92.19
alpha chlordane	92SLm03	Invertebrate	.909 Wet	0.97 Wet	18.18	106.71
	92SLs02b	Soils	1.4814 Dry	1.642984 Dry	18.18	110.91
	92SLs07b	Soils	1.6821 Dry	1.7761989 Dry	18.18	105.59
anthracene	92SLm03	Invertebrate	.05 Wet	0.05957 Wet	10	119.14
	92SLs02b	Soils	.0685 Dry	0.31714032 Dry	10	462.98
	92SLs07b	Soils	.0925 Dry	0.06611901 Dry	10	71.48
benzo(a)pyrene	92SLm03	Invertebrate	.05 Wet	0.03956 Wet	10	79.12
	92SLs02b	Soils	.0685 Dry	0.33534636 Dry	10	489.56
	92SLs07b	Soils	.0925 Dry	0.08596803 Dry	10	92.94
benzo(b)fluoranthene	92SLm03	Invertebrate	.05 Wet	0.04194 Wet	10	83.88
	92SLs02b	Soils	.0685 Dry	0.38539076 Dry	10	562.61
	92SLs07b	Soils	.0925 Dry	0.09040853 Dry	10	97.74
benzo(e)pyrene	92SLm03	Invertebrate	.0527 Wet	0.04038 Wet	10.54	76.62
	92SLs02b	Soils	.0722 Dry	0.36687389 Dry	10.54	508.14
	92SLs07b	Soils	.0975 Dry	0.08099467 Dry	10.54	83.07
benzo(g,h,i)perylene	92SLm03	Invertebrate	.05 Wet	0.04428 Wet	10	88.56
	92SLs02b	Soils	.0685 Dry	0.29085258 Dry	10	424.6
	92SLs07b	Soils	.0925 Dry	0.07659858 Dry	10	82.81
benzo(k)fluoranthene	92SLm03	Invertebrate	.05 Wet	0.04194 Wet	10	83.88
	92SLs02b	Soils	.0685 Dry	0.38539076 Dry	10	562.61
	92SLs07b	Soils	.0925 Dry	0.09040853 Dry	10	97.74

* For a spike to be a valid measure of method accuracy, this ratio must be higher than 1.0.

SPIKE RECOVERIES (Cont.)

Analyte	Sample Number	Sample Matrix	Spike Level (ppm / %)		Amount Recovered (ppm / %)		* Spike / Background	Percent Recovery
beta BHC	92SLm03	Invertebrate	.416	Wet	0.53	Wet	8.32	127.4
	92SLs02b	Soils	.6781	Dry	0.6216696	Dry	8.32	91.68
	92SLs07b	Soils	.7695	Dry	0.7992895	Dry	8.32	103.87
biphenyl	92SLm03	Invertebrate	.05275	Wet	0.06384	Wet	10.55	121.02
	92SLs02b	Soils	.0723	Dry	0.36900804	Dry	2.52	510.38
	92SLs07b	Soils	.0976	Dry	0.07784192	Dry	10.55	79.76
chrysene	92SLm03	Invertebrate	.05	Wet	0.03918	Wet	10	78.36
	92SLs02b	Soils	.0685	Dry	0.35679396	Dry	10	520.87
	92SLs07b	Soils	.0925	Dry	0.07748668	Dry	10	83.77
cis-nonachlor	92SLm03	Invertebrate	.82	Wet	0.81	Wet	16.4	98.78
	92SLs02b	Soils	1.3361	Dry	1.3321492	Dry	16.4	99.7
	92SLs07b	Soils	1.5173	Dry	1.4653641	Dry	16.4	96.58
delta BHC	92SLm03	Invertebrate	.894	Wet	0.78	Wet	17.88	87.25
	92SLs02b	Soils	1.4569	Dry	1.0657194	Dry	17.88	73.15
	92SLs07b	Soils	1.6541	Dry	1.5097691	Dry	17.88	91.27
dibenzothiophene	92SLm03	Invertebrate	.05225	Wet	0.05644	Wet	10.45	108.02
	92SLs02b	Soils	.0716	Dry	0.33935894	Dry	5.59	473.96
	92SLs07b	Soils	.0967	Dry	0.07477798	Dry	10.45	77.33
dieldrin	92SLm03	Invertebrate	.9465	Wet	0.9	Wet	18.93	95.09
	92SLs02b	Soils	1.5422	Dry	1.2877442	Dry	18.93	83.5
	92SLs07b	Soils	1.7513	Dry	1.598579	Dry	18.93	91.28
endrin	92SLm03	Invertebrate	.897	Wet	0.79	Wet	17.94	88.07
	92SLs02b	Soils	1.4618	Dry	1.5541741	Dry	17.94	106.32
	92SLs07b	Soils	1.6599	Dry	1.4209591	Dry	17.94	85.61

* For a spike to be a valid measure of method accuracy, this ratio must be higher than 1.0.

SPIKE RECOVERIES

% Recovery Analyte	Sample Number	Sample Matrix	Spike Level (ppm / %)		Amount Recovered (ppm / %)		* Spike / Background	Percent
1,2,5,6-dibenzanthracene	92SLm03	Invertebrate	.05	Wet	0.04095	Wet	10	
81.9	92SLs02b	Soils	.0685	Dry	0.28997532	Dry	4.71	
423.32	92SLs07b	Soils	.0925	Dry	0.07722025	Dry	10	
83.48								
1,2-benzanthracene	92SLm03	Invertebrate	.05	Wet	0.03779	Wet	10	
75.58	92SLs02b	Soils	.0685	Dry	0.36465364	Dry	10	
532.34	92SLs07b	Soils	.0925	Dry	0.09609236	Dry	10	
103.88								
1,6,7-Trimethyl-naphthalene	92SLm03	Invertebrate	.0569	Wet	0.0595	Wet	8.57	
104.57	92SLs02b	Soils	.078	Dry	0.41815142	Dry	2.56	
536.09	92SLs07b	Soils	.1053	Dry	0.09671403	Dry	11.38	
91.85								
Aldrin	92SLm03	Invertebrate	.9175	Wet	0.98	Wet	18.35	
106.81	92SLs02b	Soils	1.4951	Dry	1.4209591	Dry	18.35	
95.04	92SLs07b	Soils	1.6976	Dry	1.687389	Dry	18.35	
99.4								
HCB	92SLm03	Invertebrate	1.007	Wet	0.98	Wet	20.14	
97.32	92SLs02b	Soils	1.6408	Dry	0.9325044	Dry	20.14	
56.83	92SLs07b	Soils	1.8632	Dry	0.5772647	Dry	20.14	
30.98								
Heptachlor	92SLm03	Invertebrate	.937	Wet	0.92	Wet	18.74	
98.19	92SLs02b	Soils	1.5271	Dry	1.5097691	Dry	18.74	
98.87	92SLs07b	Soils	1.7336	Dry	1.5541741	Dry	18.74	
89.65								
acenaphthalene	92SLm03	Invertebrate	.05	Wet	0.04933	Wet	10	
98.66	92SLs02b	Soils	.0685	Dry	0.32955954	Dry	5.84	
481.11	92SLs07b	Soils	.0925	Dry	0.07482238	Dry	10	
80.89								
acenaphthene	92SLm03	Invertebrate	.05	Wet	0.05678	Wet	10	
113.56	92SLs02b	Soils	.0685	Dry	0.32818436	Dry	6.29	
479.1								

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SPIKE RECOVERIES (Cont.)

Analyte	Sample Number	Sample Matrix	Spike Level (ppm / %)		Amount Recovered (ppm / %)		* Spike / Background	Percent Recovery
n-dotriacontane	92SLm03	Invertebrate	5	Wet	4.078	Wet	69.44	81.56
	92SLs02b	Soils	6.8526	Dry	4.79941043	Dry	0.85	70.04
	92SLs07b	Soils	9.2511	Dry	8.37477797	Dry	2.1	90.53
n-eicosane	92SLm03	Invertebrate	5.064	Wet	3.769	Wet	83.02	74.43
	92SLs02b	Soils	6.9403	Dry	5.67317523	Dry	211.18	81.74
	92SLs07b	Soils	9.3695	Dry	7.27797513	Dry	301.43	77.68
n-heneicosane	92SLm03	Invertebrate	5	Wet	3.685	Wet	13.19	73.7
	92SLs02b	Soils	6.8526	Dry	5.61198393	Dry	19.99	81.9
	92SLs07b	Soils	9.2511	Dry	7.26909414	Dry	40.85	78.58
n-heptadecane	92SLm03	Invertebrate	4.979	Wet	4.502	Wet	74.31	90.42
	92SLs02b	Soils	6.8238	Dry	5.76693435	Dry	290.69	84.51
	92SLs07b	Soils	9.2122	Dry	7.24689165	Dry	259.32	78.67
n-octacosane	92SLm03	Invertebrate	5	Wet	3.617	Wet	161.29	72.34
	92SLs02b	Soils	6.8526	Dry	5.76104287	Dry	14.89	84.07
	92SLs07b	Soils	9.2511	Dry	7.26465364	Dry	26.37	78.53
n-octadecane	92SLm03	Invertebrate	5.084	Wet	3.705	Wet	299.06	72.88
	92SLs02b	Soils	6.9677	Dry	5.45216771	Dry	494.71	78.25
	92SLs07b	Soils	9.4065	Dry	6.96269982	Dry	529.59	74.02
n-pentadecane	92SLm03	Invertebrate	4.9955	Wet	3.843	Wet	23.9	76.93
	92SLs02b	Soils	6.8465	Dry	5.65643059	Dry	486.1	82.62
	92SLs07b	Soils	9.2427	Dry	6.65630551	Dry	27.03	72.02
n-tetracosane	92SLm03	Invertebrate	5	Wet	3.908	Wet	151.52	78.16
	92SLs02b	Soils	6.8526	Dry	5.6881395	Dry	81.09	83.01
	92SLs07b	Soils	9.2511	Dry	7.21580817	Dry	90.58	78

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SPIKE RECOVERIES (Cont.)

Analyte	Sample Number	Sample Matrix	Spike Level (ppm / %)		Amount Recovered (ppm / %)		* Spike / Background	Percent Recovery
n-tetratriacontane	92SLm03	Invertebrate	5	Wet	3.861	Wet	81.97	77.22
	92SLs02b	Soils	6.8526	Dry	5.10694302	Dry	91.23	74.53
	92SLs07b	Soils	9.2511	Dry	7.06039076	Dry	416.67	76.32
naphthalene	92SLm03	Invertebrate	.05	Wet	0.05204	Wet	5.97	104.08
	92SLs02b	Soils	.0685	Dry	0.29638415	Dry	0.62	432.68
	92SLs07b	Soils	.0925	Dry	0.05674956	Dry	2.7	61.35
o,p'-DDD	92SLm03	Invertebrate	.3485	Wet	0.44	Wet	6.97	126.26
	92SLs02b	Soils	.5679	Dry	0.7104796	Dry	6.97	125.11
	92SLs07b	Soils	.6448	Dry	0.8436945	Dry	6.97	130.85
o,p'-DDE	92SLm03	Invertebrate	.897	Wet	0.74	Wet	17.94	82.5
	92SLs02b	Soils	1.4618	Dry	1.0657194	Dry	17.94	72.9
	92SLs07b	Soils	1.6599	Dry	1.4653641	Dry	17.94	88.28
o,p'-DDT	92SLm03	Invertebrate	.805	Wet	0.73	Wet	16.1	90.68
	92SLs02b	Soils	1.3117	Dry	1.5097691	Dry	16.1	115.1
	92SLs07b	Soils	1.4893	Dry	1.5541741	Dry	16.1	104.36
oxychlordane	92SLm03	Invertebrate	1.1435	Wet	1.36	Wet	22.87	118.93
	92SLs02b	Soils	1.8632	Dry	2.3534636	Dry	22.87	126.31
	92SLs07b	Soils	2.1159	Dry	2.4866785	Dry	22.87	117.52
p,p'-DDD	92SLm03	Invertebrate	1.015	Wet	0.93	Wet	20.3	91.63
	92SLs02b	Soils	1.6541	Dry	1.3765542	Dry	20.3	83.22
	92SLs07b	Soils	1.8779	Dry	1.8650089	Dry	20.3	99.31
p,p'-DDE	92SLm03	Invertebrate	.8655	Wet	0.75	Wet	17.31	86.66
	92SLs02b	Soils	1.4103	Dry	1.4209591	Dry	17.31	100.76
	92SLs07b	Soils	1.6012	Dry	1.5541741	Dry	17.31	97.06

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SPIKE RECOVERIES (Cont.)

Analyte	Sample Number	Sample Matrix	Spike Level (ppm / %)		Amount Recovered (ppm / %)		* Spike / Background	Percent Recovery
p,p'-DDT	92SLm03	Invertebrate	.799	Wet	0.66	Wet	15.98	82.6
	92SLs02b	Soils	1.302	Dry	0.8880995	Dry	15.98	68.21
	92SLs07b	Soils	1.4782	Dry	1.3321492	Dry	15.98	90.12
perylene	92SLm03	Invertebrate	.053	Wet	0.05155	Wet	10.6	97.26
	92SLs02b	Soils	.0726	Dry	0.34671403	Dry	10.59	477.57
	92SLs07b	Soils	.0981	Dry	0.08277087	Dry	10.6	84.37
phenanthrene	92SLm03	Invertebrate	.05	Wet	0.05399	Wet	10	107.98
	92SLs02b	Soils	.0685	Dry	0.36994275	Dry	3.23	540.06
	92SLs07b	Soils	.0925	Dry	0.09422735	Dry	10	101.87
pristane	92SLm03	Invertebrate	5.059	Wet	4.088	Wet	51.62	80.81
	92SLs02b	Soils	6.9335	Dry	5.84376955	Dry	16.98	84.28
	92SLs07b	Soils	9.3602	Dry	7.45115453	Dry	58.55	79.6
pyrene	92SLm03	Invertebrate	.05	Wet	0.06345	Wet	10	126.9
	92SLs02b	Soils	.0685	Dry	0.38571932	Dry	6.63	563.09
	92SLs07b	Soils	.0925	Dry	0.09511545	Dry	10	102.83
trans-nonachlor	92SLm03	Invertebrate	.771	Wet	0.75	Wet	15.42	97.28
	92SLs02b	Soils	1.2562	Dry	1.3321492	Dry	15.42	106.05
	92SLs07b	Soils	1.4267	Dry	1.3321492	Dry	15.42	93.37

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COMMENTS (RESULT MODIFERS AND QA/QC COMMENTS)

Analyte	Sample Number	Result Modifier

- NO DATA EXIST FOR THIS SECTION.

QA/QC Comments

Accuracy and precision, as measured by spike sample recovery and duplicate sample analysis, were generally acceptable.
High recovery results for PAHs in sample 92SLs02b are due to reporting error from the lab, please disregard.
High RPD for n-dodecane in 92SLs02b probably due to matrix interference.

APPROVED,CSH

Appendix B

Photographs

St. Lazaria Island northern end.

St. Lazaria Island southern end, view from sampling station.

Antenna tower base in vegetation.

Building remains in vegetation.

R. Britton collecting soil samples.

D. Rudis collecting soil samples.
(note thick organic layer)