PEBBLE PROJECT
ENVIRONMENTAL BASELINE DOCUMENT
2004 through 2008

CHAPTER 35.
TRACE ELEMENTS
AND OTHER NATURALLY OCCURRING CONSTITUENTS
Cook Inlet Drainages

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ACRONYMS AND ABBREVIATIONS

ADEC	Alaska Department of Environmental Conservation
AHCs	aliphatic hydrocarbons
AKMAP	Alaska Monitoring and Assessment Program
AVS	acid volatile sulfide
BEESC	Bristol Environmental & Engineering Services Corporation
BTEX	benzene, toluene, ethylbenzene and xylene
cm	centimeter(s)
CPI	carbon preference index
CV	coefficient of variation
DRO	diesel-range organics
FMP	Fish Monitoring Program (Alaska Department of Environmental Conservation)
FOD	frequency of detection
GRO	gasoline-range organics
IIE	Iniskin/Iliamna Estuary
kg	kilogram(s)
MDL	method detection limit
mg	milligram(s)
MRL	method reporting limit
NOAA	National Oceanic and Atmospheric Administration
NOC	naturally occurring constituent
ORNL	Oak Ridge National Laboratory
OCSEAP	Outer Continental Shelf Environmental Assessment Program
P	relative significance (statistically)
PAHs	polynuclear aromatic hydrocarbons
QA	quality assurance
QAPP	quality assurance project plan
QC	quality control
RRO	residual-range organics
SEM	simultaneously extractable metal
SQuiRT	Screening Quick Reference Tools
TKN	total Kjeldahl nitrogen
TOC	total organic carbon
TPH	total petroleum hydrocarbons
µg	microgram(s)
µmol	micromole(s)

35. TRACE ELEMENTS

The target analytes in the Pebble Project study of trace elements and other naturally occurring constituents (referred to herein as the trace elements study) are trace elements (also called metals) and other analytes that occur naturally in the environment. These other naturally occurring constituents (NOCs) include compounds such as cations, anions, total organic carbon and petroleum-range hydrocarbons.

35.1 Soil and Terrestrial Vegetation

35.1.1 Introduction

This describes the trace elements study of soil and terrestrial vegetation in the Cook Inlet drainages study area. Soil and vegetation were sampled in 2004, 2006, and 2007 to assess spatial and temporal variability of trace elements, anions, and cations in the study area. A subset of the soil samples also was analyzed for petroleum-range hydrocarbons (diesel-range and residual-range hydrocarbons).

35.1.2 Study Objectives

The objectives of the soil and vegetation portions of the trace elements study for the Cook Inlet drainages study area are as follows:

- Identify the vegetation species present.
- Collect baseline data to provide scientific documentation of the existing natural levels of NOCs in surface soil and vegetation.
- Evaluate surface soil for naturally occurring biogenic fingerprints associated with petroleum-range hydrocarbons.

35.1.3 Study Area

The Cook Inlet drainages study area encompasses the area between the western Cook Inlet drainages boundary and Iniskin Bay and includes both coastal and upland sampling locations (Figure 35.1-1).

35.1.4 Scope of Work

The field work for trace elements in soil and vegetation in the Cook Inlet drainages were conducted by Bristol Environmental & Engineering Services Corporation (BEESC). The following work was conducted from 2004 through 2007:

- Collection of a soil sample from the upper 6 inches of the soil profile at each of four locations (TE18 through TE21, Figure 35.1-1) in 2004, and analysis for trace elements, anions and cations, petroleum-range hydrocarbons (one sample only), and total organic carbon.

- Collection of a soil sample from the upper 6 inches of the soil profile at each of seven locations (TE18 through TE24, Figure 35.1-1) in 2006, and analysis for trace elements, anions and cations, and total organic carbon.
- Collection of 30 vegetation samples from five locations (TE18 through TE22, Figure 35.1-1) in 2004, and analysis for trace elements, and anions and cations. Some vegetation samples included fruit (berries), but the fruit tissue was not separated from the vegetative tissue before sample analysis; therefore, those samples are treated as vegetative tissue samples. Separate fruit tissue samples were collected later in 2004, as well as in 2006 and 2007, as described below.
- Collection of 40 vegetative tissue samples from seven locations (TE18 through TE24, Figure 35.1-1) in 2006, and analysis for trace elements, and anions and cations.
- Collection of 41 vegetative tissue samples from seven locations (TE18 through TE24, Figure 35.1-1) in 2007, and analysis for trace elements, and anions and cations.
- Collection of 5 fruit tissue samples from two of the vegetation sampling locations (TE21 and TE22, Figure 35.1-1) in 2004, and analysis for trace elements, and anions and cations.
- Collection of 9 fruit tissue samples from six of the vegetation sampling locations (TE18 through TE22 and TE24, Figure 35.1-1) in 2006, and analysis for trace elements, and anions and cations. No berry-producing plants were identified for sampling at TE23, so only vegetative tissue samples were collected at that location.
- Collection of 5 fruit tissue samples from two of the vegetation sampling locations (TE21 and TE22, Figure 35.1-1) in 2007, and analysis for trace elements, and anions and cations.

The soil sampling effort was designed to collect samples that are representative of the predominant soil types encountered and to establish the spatial distribution of NOCs among the sampling locations in the study area.

The vegetation sampling was intended to document the species and the NOC concentrations present, particularly in and on vegetation that may be a food source for upland mammals, birds, or humans. In addition, vegetation used traditionally for medicinal purposes was sampled. The types of vegetation sampled were trees, shrubs, forbs, grasses and sedges, mosses, and lichens, including berry-producing species.

35.1.5 Methods

35.1.5.1 Sample Collection

In general, methods for collection of samples were consistent with those outlined in the consolidated study program (Appendix E of this environmental baseline document) and the relevant field sampling plans (Appendix F of this environmental baseline document) for the Pebble Project. The procedures for collection of soil and vegetation samples in the Cook Inlet drainages and the laboratory analyses for those samples were the same as those used in the Bristol Bay drainages (Chapter 10). Quality assurance (QA) and quality control (QC) protocols followed procedures outlined in the quality assurance project plans

(Appendix G of this environmental baseline document). A photographic log of the sampling efforts is provided in Appendix 35.1A.

Soil

Soil samples were collected as a composite sample from the top 6 inches below the soil surface. Similar amounts of soil were collected from four random locations within a 3-foot-square area adjacent to the vegetation sampling area. The soil was collected with a gloved hand or trowel and was placed into a stainless steel bowl. The soil was mixed and rocks were removed by hand, and the soil was placed into the sample container. The bowl, trowel, and other tools used were washed with an Alconox detergent and water solution and rinsed with deionized water between samples, and gloves were changed between samples. General soil type and color were documented.

Vegetation

At each vegetation sample site, a sample area encompassing a 10-foot radius of typical vegetation for the area was designated. All observed plant species within each sample area were documented. Four to eight species were sampled at each location. Approximately 50 grams (weighed on a portable scale) of leaves, berries, shoots, and/or other edible/browsable portions of the plant were collected and placed into a resealable plastic bag. Gloves were worn and were changed between samples. If scissors or shears were used, they were washed with an Alconox detergent and deionized water solution and rinsed with deionized water between samples.

Initially all edible portions of plants including vegetative tissue (leaves and shoots) and fruit tissue (berries) were collected as a single sample. However, large quantities of berries in the mine study area enabled fruit tissue-only samples to be collected there. To maintain consistency in sampling procedures between the mine study area and the Cook Inlet drainages study area, after the initial sampling event in the Cook Inlet drainages, fruit tissue were segregated from vegetative tissue (as noted in Section 35.1.4). This segregation also allowed for comparison of NOC concentrations between fruit and vegetative tissue.

Table 35.1-1 lists the vegetation species sampled from in the Cook Inlet drainages study area.

35.1.5.2 Data Reduction

This section summarizes how the raw data were processed and used for data evaluation.

Soil

Summary statistics were compiled for soil. Only primary sample data were used for analyses. Non-detect results (analyte not detected above the method detection limit) were included as one-half the method detection limit (MDL); non-detect results flagged with a "U" or "UJ" qualifier were included as one-half the method reporting limit (MRL). The data summary includes the following statistics:

- Number of samples in which analytes were detected above the MDL compared to the number of samples analyzed, and the resulting percentage of detections (i.e., the frequency of detection [FOD]).
- Minimum and maximum detected concentrations.

- Minimum and maximum MDLs and MRLs.
- Mean and median concentrations.
- Standard deviations and coefficients of variation (CVs).

Vegetation

Primary sample data for each NOC and plant species were sorted and evaluated to examine differences among species, among plant groups (trees, shrubs, etc.), and between vegetative and fruit tissue, as well as among NOCs within the same species. Only data for primary samples were evaluated.

The following general statistics were calculated for each plant group by analyte:

- FODs.
- Minimum and maximum detected concentrations.
- Minimum and maximum MDLs and MRLs.
- Mean and median concentrations detected.
- Standard deviations and CVs.

As for soil data, for calculation of summary statistics, non-detect results (analyte not detected above the MDL) were included as one-half the MDL; non-detect results flagged with a "U" or "UJ" qualifier were included as one-half the MRL.

Statistical evaluation by the Mann-Whitney U-test was performed to compare differences between fruit and vegetative tissue. Comparison was possible when at least five samples of both vegetative and fruit tissue were collected for a single species were analyzed. For the Mann-Whitney U-tests, non-detect results were included as zero, and non-detect results flagged with a "U" or "UJ" qualifier were included as the MRL value.

The predominant upland habitat type in the Cook Inlet drainages study area is coastal spruce-hemlock forest. Since all plant samples for the study area were collected from this single habitat type, no cross-habitat comparisons were possible.

35.1.6 Results and Discussion

35.1.6.1 Soil

Eleven soil samples (four in 2004 and seven in 2006) were collected in the Cook Inlet drainages study area and analyzed. All 11 samples were analyzed for 26 trace elements, anions and cations, and total organic carbon (fluoride was reported in only 10 samples because one sample result was rejected based on a holding-time exceedence). Only one sample was analyzed for petroleum-range hydrocarbons (diesel-range organics and residual-range organics), consistent with the objective of sampling 10 percent of soil samples for this constituent. All soil samples for the Cook Inlet study area were collected from the coastal spruce-hemlock forest type of habitat.

The soil data are summarized in Table 35.1-2. All laboratory results for soil are presented in Appendix 35.1B. Soil data are presented on a dry weight basis, with the exception of total solids data, which are presented on a wet weight basis. For ease in readability, concentrations greater than 1,000 were rounded to the nearest hundred in the discussion below.

Box-and-whisker plots are provided in Appendix 35.1C. For these plots, non-detect results (analyte not detected above method detection limit) were excluded to avoid artificially skewing the shape of the plots, while non-detect results flagged with a “U” or “UJ” qualifier were included as the MRL value.

Trace Elements

All 26 trace elements for which samples were analyzed were detected in at least one soil sample from the Cook Inlet drainages study area (Table 35.1-2). Fourteen elements were detected above the MDL in all 11 samples, and two elements—nickel and selenium—were detected in all but one sample (91 percent of samples). Antimony, arsenic, boron, and thallium were detected in 55 to 73 percent of samples. Beryllium, cadmium, and molybdenum were detected in 27 to 45 percent of samples. Bismuth, silver, and tin were each detected in only one sample (9 percent of samples).

Iron and aluminum were present at the highest concentrations (mean concentrations of 9,900 milligrams per kilogram [mg/kg] and 31,000, mg/kg respectively), and levels of magnesium and calcium were next highest (mean concentrations of 3,600 mg/kg and 3,800 mg/kg, respectively). Potassium and manganese concentrations were lower still (mean concentrations of 854 mg/kg and 177 mg/kg, respectively). Mean concentrations for all other trace elements were less than 60 mg/kg.

Concentrations of a given element vary greatly among sampling locations, and concentrations vary greatly among elements within a given location. The range of CVs among trace elements for the Cook Inlet drainages study area was 0.49 to 2.36, and CVs exceeded 1.0 for 11 elements. The variability is also illustrated in the box-and-whisker plots (Appendix 35.1C).

Anions and Cations

Anions and cations were grouped together for this evaluation. The anions are chloride, cyanide, fluoride, and sulfate, and the cations are ammonia (as nitrogen) and sodium. The FODs for these analytes ranged from 100 percent for ammonia (as nitrogen), sodium, and sulfate to 10 percent for fluoride (Table 35.1-2). Only fluoride was detected in less than 60 percent of soil samples.

Sodium and ammonia (as nitrogen) had the highest mean concentrations at 421 mg/kg and 311 mg/kg, respectively. Cyanide and fluoride had the lowest means concentrations at 0.15 mg/kg and 0.43 mg/kg, respectively.

Variability, as evaluated through the CVs, was relatively high (CVs greater than 1.0) for chloride and cyanide (Table 35.1-2). The highest CV was for cyanide at 1.33. Chloride had a CV of 1.31. The lowest variability was for sodium, which had a CV of 0.42. The variability of individual anions and cations is further illustrated in the box-and-whisker plots (Appendix 35.1C).

Biogenic Hydrocarbons

One soil sample for the Cook Inlet drainages study area was analyzed for petroleum-range hydrocarbons. Hydrocarbons in soil can be due to either the biogenic breakdown of plant material or releases of petroleum. No development had occurred in the area where this soil sample was collected (location TE20; Figure 35.1-1), and the chromatogram from the sample confirmed that the detected petroleum-range hydrocarbons were likely to originate from biogenic sources. Both diesel-range organics (DRO) and residual-range organics (RRO) were detected in the soil sample, at 103 mg/kg and 1,300 mg/kg, respectively (Table 35.1-2).

Total Organic Carbon

Total organic carbon (TOC) was detected in each of the 11 samples (Table 35.1-2). The mean concentration for the samples was 15.4 percent.

35.1.6.2 Vegetation

For the Cook Inlet drainages study area, 130 vegetation samples were collected and were analyzed for trace elements, anions, and cations. For laboratory analysis, vegetative tissue was segregated from fruit tissue (except for some samples collected in August 2004). For data evaluation, vegetation samples were organized by the six plant types—forbs, grasses and sedges, lichens, mosses, shrubs, and trees—and fruit tissue (berries). The samples were identified by plant species; fruit tissue samples, all of which were collected from berry-producing shrub species, were treated as a separate group. The data for each plant type and fruit tissue are summarized in Tables 35.1-3 through 35.1-9. All vegetation data for the Cook Inlet drainages study area are presented in Appendix 35.1D. (In Appendix 35.1D, the samples are identified by the scientific names for species. Table 35.1-1 gives both the common names and the scientific names for the plant species collected in the Cook Inlet drainages.) Data are presented on a dry weight basis, with the exception of total solids data, which are presented on a wet weight basis. Box-and-whisker plots are provided in Appendix 35.1E. For these plots, non-detect results were excluded, and non-detect results flagged with a “U” or “UJ” qualifier were included as the MRL value.

The Mann-Whitney U-test was used to do a comparison between fruit and vegetative tissue. This comparison was done for two species—lingonberry and crowberry (Tables 35.1-10 and 35.1-11, respectively).

As is evident from Table 35.1-1, the most sampled plant type was shrubs. Vegetative tissue samples from shrubs represented 35 percent of all vegetation samples, with fruit tissue samples (all from shrubs) comprising another 15 percent of all vegetation samples. Trees, forbs, grasses/sedges, and mosses comprised between 9 and 15 percent of the vegetation samples, and lichens represented 4 percent of the vegetation samples.

The data evaluation for vegetation samples is summarized below. For ease in readability, concentrations greater than 1,000 were rounded to the nearest hundred in the following discussion.

Trace elements

The 26 trace elements for which samples were analyzed were detected in at least some samples for most plant types. For every plant type, the essential nutrients calcium, potassium, and magnesium had the highest mean concentrations among the trace elements (Tables 35.1-3 through 35.1-9).

Variability (as measured by CVs) differed among the plant types. Lichens, for example, had only two trace elements with a CV greater than 1.0, while other plant types had as many as 13 trace elements with CVs greater than 1.0. This may indicate lower variability in lichens than in other plant types, but the relatively small sample sizes preclude definitive conclusions.

Fruit Tissue: Of the 26 trace elements for which samples were analyzed, 24 were detected above the MDL in at least one of the 19 fruit tissue samples (Table 35.1-3). Twelve trace elements were detected in 100 percent of the samples, and another three trace elements detected in 74 to 79 percent of the samples. Vanadium and molybdenum were detected in 63 and 47 percent of the samples, respectively. Chromium and bismuth were detected in 37 and 32 percent of the samples, respectively. Arsenic, cadmium, silver, thallium, and tin were detected in less than 25 percent of the samples. Beryllium and selenium were not detected in any fruit tissue samples.

As previously noted, calcium, magnesium, and potassium were present at the highest concentrations (mean concentrations of 1,200 mg/kg, 656 mg/kg, and 8,100 mg/kg, respectively). Iron and manganese had mean concentrations of 44.0 mg/kg and 69.3 mg/kg, respectively. All other trace elements had mean concentrations of less than 17 mg/kg.

Variability, as measured through the CV, was high (CV greater than 1.0) for eight of the 24 trace elements detected in fruit tissue samples. The lowest variability among the detected trace elements was for chromium (CV of 0.34), and the highest was for arsenic (CV of 5.48).

Forbs: All but one of the 26 trace elements for which samples were analyzed was detected above the MDL in at least one of the 15 forb samples (Table 35.1-4). Sixteen trace elements were present in 100 percent of the forb samples, and cadmium was detected in all but one sample (93 percent of the samples). Antimony, arsenic, selenium, and thallium were detected in 40 to 53 percent of the samples. Beryllium, chromium, silver, and tin were detected in 33 percent or less of the samples. Bismuth was not detected in any forb samples.

Calcium, magnesium, and potassium again were present at the highest concentrations (mean concentrations of 10,600 mg/kg, 4,300 mg/kg, and 20,400 mg/kg, respectively). Concentrations of manganese were next highest (mean concentration of 306 mg/kg), followed by aluminum, barium, boron, iron, and zinc (mean concentrations from 26.7 mg/kg to 96.5 mg/kg). All other trace elements had mean concentrations below 8.0 mg/kg.

Variability was relatively high (CVs greater than 1.0) for 10 of the 25 trace elements detected in forbs; however, no CV exceeded 2.0. The lowest CV (0.34) was for potassium, and the highest (1.95) was for cadmium.

Grasses and Sedges: Each of the 26 trace elements for which samples were analyzed was detected above MDLs in at least one of the 14 grass or sedge samples (Table 35.1-5). Fourteen trace elements were present in 100 percent of the samples, and aluminum and vanadium were detected in 93 and 86 percent of the samples, respectively. Antimony and cadmium were detected in 50 and 57 percent of all samples, respectively. Arsenic, beryllium, bismuth, chromium, selenium, silver, thallium, and tin were each detected in less than 50 percent of the samples.

As previously noted, calcium, magnesium, and potassium were present at the highest concentrations (mean concentrations of 3,800 mg/kg, 1,300 mg/kg, and 14,500 mg/kg, respectively). Iron and manganese had the next highest mean concentrations of 72.6 mg/kg and 174 mg/kg, respectively. All other trace elements had mean concentrations of less than 22 mg/kg.

Variability was high (CVs greater than 1.0) for five of the trace elements detected in grasses and sedges. The lowest CV (0.25) was for silver, and the highest (1.40) was for bismuth.

Lichens: All but one of the 26 trace elements for which samples were analyzed were detected above the MDLs in at least one of the five lichen samples (Table 35.1-6). Eighteen (almost 70 percent) of the trace elements were present above method detection limits in 100 percent of the samples. Another four trace elements—molybdenum, selenium, silver, and thallium—were detected in 60 or 80 percent of the samples. Beryllium, bismuth, and tin were detected in 20 or 40 percent of the samples. Boron was not detected in any lichen samples.

Again the essential nutrients calcium, magnesium, and potassium were detected at the highest concentrations (mean concentrations of 1,100 mg/kg, 702 mg/kg, and 970 mg/kg, respectively). Aluminum and iron had lower mean concentrations of 246 mg/kg and 240 mg/kg, respectively. All other trace elements had mean concentrations of less than 42 mg/kg.

Only two trace elements detected in lichen samples had CVs higher than 1.0—bismuth at 1.07 and nickel at 1.02. The lowest CV (0.15) was for cobalt.

Mosses: Each of the 26 trace elements for which samples were analyzed was detected above the MDLs in at least some of the 12 moss samples (Table 35.1-7). Fifteen trace elements were detected in 100 percent of the samples. Another four trace elements—arsenic, cadmium, molybdenum, and thallium—were detected in all but one sample (92 percent of samples). Antimony, bismuth, boron, chromium, and selenium were detected in 58 to 83 percent of the samples. Only beryllium and tin were detected in less than 50 percent of the samples (42 and 25 percent of all samples, respectively).

The essential nutrients calcium, iron, magnesium, and potassium, and the element aluminum, were present at the highest concentrations (mean concentrations of 4,500 mg/kg, 1,600 mg/kg, 1,800 mg/kg, 4,600 mg/kg, and 1,400 mg/kg, respectively). Manganese had a mean concentration of 292 mg/kg. All other trace elements had mean concentrations of less than 32 mg/kg.

Nine trace elements had CVs higher than 1.0 for the moss samples, and the CVs for chromium and nickel were greater than 2.0. The lowest CV (0.42) was for magnesium, and the highest CV (2.65) was for chromium.

Shrubs: Each of the 26 trace elements for which samples were analyzed was detected above the MDLs in at least one of the 46 shrub vegetation samples (Table 35.1-8). Fourteen trace elements were detected in 100 percent of the samples. Molybdenum and vanadium were detected in 87 and 91 percent of the samples, respectively. Cadmium was detected in 70 percent of samples. Antimony and thallium were detected in 50 and 46 percent of the samples, respectively. Arsenic, beryllium, bismuth, chromium, selenium, silver, and tin were detected in less than 35 percent of the samples, with beryllium being detected in only one (2 percent) of the 46 samples.

As for most of the plant types, calcium, magnesium, and potassium were detected at the highest concentrations (mean concentrations of 7,800 mg/kg, 2,700 mg/kg, and 8,800 mg/kg, respectively). Aluminum, iron, and manganese had substantially lower mean concentrations of 116 mg/kg, 94.9 mg/kg, and 401 mg/kg, respectively). All other trace elements had mean concentrations of less than 28 mg/kg.

Variability was high (CVs higher than 1.0) for 13 trace elements, and three of those elements had CVs higher than 2.0. The lowest CV (0.40) was for copper, and the highest CV (3.22) was for cadmium.

Trees: All but one of the 26 trace elements for which samples were analyzed were detected above MDLs in at least one of the 19 tree samples (Table 35.1-9). Fourteen trace elements were detected in 100 percent of the samples. Antimony and vanadium were detected in 74 and 95 percent of the samples, respectively. Beryllium, cadmium, chromium, molybdenum, and silver were detected in 32 to 53 percent of samples. Tin was detected in 21 percent of all samples; and arsenic, bismuth, and thallium were each detected in 16 percent of the samples. Selenium was not detected in any of the 19 tree samples.

Again, calcium, magnesium, and potassium were present at the highest concentrations (mean concentrations of 4,700 mg/kg, 2,000 mg/kg, and 8,200 mg/kg, respectively). Aluminum, iron, and manganese had substantially lower mean concentrations of 97.5 mg/kg, 57.8 mg/kg, and 170 mg/kg, respectively. All other trace elements had mean concentrations of less than 30 mg/kg.

Six of the 25 detected trace elements—bismuth, cadmium, cobalt, lead, molybdenum, and silver—had CVs greater than 1.0. The lowest CV (0.20) for detected trace elements was for potassium, and the highest CV was for silver at 4.05. Molybdenum also had a CV higher than 2.0.

Anions and Cations

All of the anions and cations were detected above the MDL in at least one sample from each plant type, with the exception of ammonia (as nitrogen) in lichens (Tables 35.1-3 through 35.1-9). For every plant type, sodium, chloride, and sulfate were each detected in all samples. These three anions and cations also had the highest concentrations for all plant types. Analyses for chloride, fluoride, ammonia as nitrogen, and sulfate were performed only in 2004.

Variability (as measured by CVs) was fairly consistent among plant types. Cyanide in forbs and sodium in shrubs were the only constituents with CVs greater than 2.0. This fairly consistent variability is evident from the box-and-whisker plots in Appendix 35.1E.

Fruit Tissue: All of the anions and cations analyzed were detected above the MDLs in at least one fruit tissue sample. Three of the six analytes—chloride, ammonia (as nitrogen), and sodium—were detected in 100 percent of fruit tissue samples that were analyzed for these NOCs (Table 35.1-3). Cyanide and fluoride were each detected in about 20 percent of the samples analyzed for those NOCs, and sulfate was detected in 80 percent of the analyzed samples.

Sulfate and chloride were present at the highest concentrations (mean concentrations of 2,700 mg/kg and 986 mg/kg, respectively). Sodium and ammonia (as nitrogen) had lower mean concentrations of 266 mg/kg and 53.0 mg/kg, respectively. Cyanide and fluoride had mean concentrations of 0.49 mg/kg and 2.04, respectively.

Chloride had the highest CV among fruit tissue samples at 1.64.Fluoride also had a CV greater than 1.0, at 1.13. Ammonia (as nitrogen) had the lowest CV at 0.68.

Forbs: All of the analytes except cyanide were present above MDLs in 100 percent of forb samples that were analyzed for these NOCs (Table 35.1-4). Cyanide was detected in 40 percent of the samples analyzed for cyanide.

Chloride and sulfate had the highest mean concentrations of 10,100 mg/kg and 6,600 mg/kg, respectively. Sodium and ammonia (as nitrogen) had lower mean concentrations of 1,000 mg/kg and 815 mg/kg, respectively. Cyanide and fluoride had substantially lower mean concentrations of 6.31 mg/kg and 19.1 mg/kg, respectively.

Cyanide had the highest CV among forb samples at 3.54. Chloride and sulfate (each with CVs of 1.16) and sodium (CV of 1.32) also had CVs above 1.0. Ammonia (as nitrogen) had the lowest CV at 0.30.

Grasses and Sedges: All of the analytes except cyanide were present above MDLs in 100 percent of the grass and sedge samples that were analyzed for these NOCs (Table 35.1-5). Cyanide was detected in 36 percent of the samples analyzed for cyanide.

Chloride and sulfate were detected at the highest concentrations (mean concentrations of 7,600 mg/kg and 1,300 mg/kg, respectively), and ammonia (as nitrogen) and sodium had lower mean concentrations of 559 mg/kg and 440 mg/kg, respectively. Cyanide and fluoride had substantially lower mean concentrations of 0.33 mg/kg and 14.4 mg/kg, respectively.

Cyanide had the highest CV at 1.57. Sodium (1.39) also had a CV greater than 1.0. Fluoride had the lowest CV at 0.077.

Lichens: All but one of the anions and cations for which samples were analyzed were detected above the MDLs in at least one lichen sample (Table 35.1-6). Chloride, sodium, and sulfate were detected in 100 percent of lichen samples that were analyzed for these NOCs. Cyanide and fluoride were present in 40 and 50 percent, respectively, of samples analyzed for these NOCs. Ammonia (as nitrogen) was not detected in any lichen samples.

Sodium, chloride, and sulfate were present at the highest concentrations (mean concentrations of 426 mg/kg, 155 mg/kg, and 126 mg/kg, respectively). Cyanide and fluoride had substantially lower mean concentrations at 0.43 mg/kg and 0.20 mg/kg, respectively.

None of the analytes had a CV above 1.0. Chloride had the highest CV at 0.79, and sulfate had the lowest CV at 0.090.

Mosses: All of the anions and cations for which samples were analyzed were detected above the MDLs in at least some moss samples (Table 35.1-7). Chloride, sodium, and sulfate were detected in 100 percent of moss samples that were analyzed for these NOCs. Fluoride and ammonia (as nitrogen) were each present in 67 percent of samples analyzed for these NOCs. Cyanide was detected in 42 percent of analyzed samples.

Sodium and sulfate were present at the highest concentrations (mean concentrations of 248 mg/kg and 226 mg/kg, respectively). Chloride had a lower mean concentration of 154 mg/kg. Cyanide, fluoride, and ammonia (as nitrogen) had substantially lower mean concentrations ranging from 0.39 mg/kg to 19.9 mg/kg.

Ammonia (as nitrogen) had the highest CV at 1.40. Chloride (1.39) and sulfate (1.38) also had CVs greater than 1.0. Sodium had the lowest CV at 0.51.

Shrubs: All of the anions and cations were detected above the MDLs in at least some shrub samples (Table 35.1-8). Chloride, sodium, and sulfate were detected in 100 percent of the shrub samples that were analyzed for these NOCs. Fluoride and ammonia (as nitrogen) were present in 93 and 71 percent, respectively, of samples analyzed for these NOCs. Cyanide was detected in 28 percent of analyzed samples.

Chloride, sodium, and sulfate were present at the highest concentrations (mean concentrations of 2,600 mg/kg, 1,500 mg/kg, and 2,200 mg/kg, respectively). Ammonia (as nitrogen) had a lower mean concentration of 256 mg/kg. Cyanide and fluoride had substantially lower mean concentrations of 0.37 mg/kg and 10.8 mg/kg, respectively.

Sodium had the highest CV at 2.33. Fluoride had the lowest CV at 0.86. CVs for the other four ions were between 1.3 and 1.5.

Trees: All of the anions and cations for which samples were analyzed were detected above the MDLs in at least some tree samples (Table 35.1-9). Chloride, ammonia (as nitrogen), sodium, and sulfate were detected in 100 percent of tree samples that were analyzed for these NOCs. Cyanide and fluoride were present in 21 percent and 80 percent, respectively, of analyzed samples.

Chloride and sulfate were present at the highest concentrations (mean concentrations of 2,700 mg/kg and 1,000 mg/kg, respectively). Sodium and ammonia (as nitrogen) had lower mean concentrations of 324 mg/kg and 50.9 mg/kg, respectively. Cyanide and fluoride had substantially lower mean concentrations of 0.22 mg/kg and 7.60 mg/kg, respectively.

Cyanide had the highest CV at 1.11, and chloride had the lowest CV at 0.49. Sodium (1.04) was the only other ion with a CV above 1.0.

Comparison of Fruit Tissue Results to Vegetative Tissue Results

The Mann-Whitney U statistical test was performed to compare mean concentrations of NOCs in fruit tissue samples and vegetative tissue samples from the Cook Inlet drainages. This statistical comparison was done for two species: lingonberry and crowberry. The purpose of this comparison was to identify if fruit tiusse and vegetative tissue contained significantly different concentrations of constituents.

The comparison indicated that there were significant differences in concentrations of some trace elements and one cation (sodium) between vegetative tissue samples and fruit tissue samples (Tables 35.1-10 and 35.1-11). For nearly all NOCs that showed a significant difference in concentration between fruit and vegetative tissue, the concentrations were higher for vegetative tissue. Of the NOCs with significant differences, only potassium (in both species) and sodium (in crowberries) showed higher concentrations in fruit tissue than in vegetative tissue.

Several NOCs—aluminum, barium, calcium, cobalt, magnesium, manganese, potassium, and zinc—had significant differences between fruit tissue and vegetative tissue for both crowberry samples and lingonberry samples. In addition, mercury showed a significant difference between fruit and vegetative tissue from crowberry plants; boron, cadmium, and sodium each showed significant differences between fruit and vegetative tissue from lingonberry plants. These results indicate that samples of fruit tissue and of vegetative tissue had significantly different concentrations of many trace elements, and that concentrations in fruit tissue were almost always lower than concentrations in vegetative tissue samples.

35.1.7 Summary

The Cook Inlet drainages study area encompasses the area between the western Cook Inlet drainages boundary and Iniskin Bay and includes both coastal and upland sampling locations. The objectives and sampling methods were similar to those described for mine study area (Chapter 10). During the 2004, 2006, and 2007, 11 soil samples and 130 vegetation samples (including 111 vegetative tissue and 19 fruit tissue samples) were collected and analyzed.

All trace elements, anions, and cations analyzed were detected in at least some soil samples. DRO and RRO both were present at detectable concentrations in the single soil sample analyzed for these constituents. Total organic carbon was detected in each of the 11 soil samples.

Vegetation samples were collected from six plant types: trees, shrubs, forbs, grasses and sedges, mosses, and lichens; all fruit tiusse samples were collected from berry-producing shrubs. The plant type sampled most frequently was shrubs, and the least frequently sampled plant type was the lichens. All trace elements, anions, and cations were detected in at least some vegetation samples.

35.1.8 Glossary

Biogenic—produced by living organisms or biological processes.

35.2 Freshwater Sediment

35.2.1 Introduction

This section presents the findings of the trace elements study for freshwater sediment in the Cook Inlet drainages study area. Sediment from freshwater streams and ponds was sampled in 2004 through 2007 to assess spatial and temporal variability of NOCs.

35.2.2 Study Objectives

The objective of this study was to determine baseline concentrations of NOCs in stream and pond sediments in the Cook Inlet drainages study area.

35.2.3 Study Area

The Cook Inlet drainages study area for NOCs in sediment is that same as that for NOCs in soil and vegetation, although the sampling locations are different (Figure 35.1-1).

35.2.4 Scope of Work

The field work was conducted by BEESC. During 2004 through 2007, 19 samples (as described below) were collected and analyzed for trace elements, anions, and cations. In 2006 only, additional chemical analyses were performed for total sulfur, acid volatile sulfide (AVS), and simultaneously extractable metals (SEMs); these analyses were added to allow evaluation of the bioavailability of NOCs in sediment.

The following samples were collected from the Cook Inlet drainages study area in 2004 through 2007:

- Collection of one stream sediment sample in August 2004 and one in September 2004 from one location (GS21; Figure 35.1-1).
- Collection of seven sediment samples in 2005—one sample from GS21 in May, one sample from each of four locations (GS21, GS22, PSC, and PSD) in July, and one sample each from GS21 and GS22 in September (see Figure 35.1-1 for sampling locations).
- Collection of one sediment sample each from four stream locations (SW1 through SW4; Figure 35.1-1) and one pond (Pond 6) in August 2006.
- Collection of four sediment samples from streams and one from a pond in 2007—one sample from SW2 in September; one sample each from SW1, SW3, and SW4 in October; and one sample from Pond 6 in October (see Figure 35.1-1 for sampling locations).

The locations for stream sediment sampling coincide with locations used for surface water-quality sampling (Chapter 33) and for surface hydrology-monitoring stations (Chapter 31). Stream sediments were collected at the same time as surface water-quality samples.

35.2.5 Methods

35.2.5.1 Sample Collection

In general, methods for collection of sediment samples were consistent with those outlined in the consolidated study program (Appendix E of this environmental baseline document) and the relevant field sampling plans (Appendix F of this environmental baseline document) for Pebble Project. QA/QC protocols followed procedures outlined in the quality assurance project plans (Appendix G). The procedures used for the Cook Inlet drainages study area were the same as those used for the Bristol Bay drainages (Chapter 10). A photographic log of the sampling effort is provided in Appendix 35.1A. All activities were coordinated with SLR International to ensure consistency between methods used in the Cook Inlet drainages and those used at the mine study area.

The laboratory analyses for the sediment samples from the Cook Inlet drainages study area are listed in Table 35.2-1.

35.2.5.2 Data Reduction

The methods for data reduction for sediment samples were similar to those used for the Bristol Bay drainages. The following general statistics were compiled (Tables 35.2-2 and 35.2-3):

- The FOD.
- Minimum and maximum detected concentrations.
- Minimum and maximum MDLs and MRLs.
- Mean and median concentrations.
- Standard deviations and CVs.

Only primary sample data were included for the analysis. Non-detect results (analyte not detected above the MDL) were included for the summary statistics as one-half the MDL; non-detect results flagged with a “U” or “UJ” qualifier were included as one-half the MRL.

Box-and-whisker plots were created for sediment (Appendix 35.2B). For these plots, non-detect results were excluded, while non-detect results flagged with a “U” or “UJ” qualifier were included as the MRL. Values of zero were excluded to avoid artificially skewing the shape of the plots.

35.2.6 Results and Discussion

Nineteen sediment samples were collected from the nine locations during 2004 through 2007. Sediment data for all samples are summarized in Tables 35.2-2 and 35.2-3, and individual sample results are provided in Appendix 35.2A. In the following sections, concentrations greater than 1,000 were rounded to the nearest hundred for ease of readability.

35.2.6.1 Trace elements

All but one of the 26 trace elements for which the sediment samples were analyzed were detected above the MDL in at least one sample (Table 35.2-2). Fourteen trace elements were detected in 100 percent of sediment samples. Beryllium, cadmium, iron, and selenium were detected in 74 to 95 percent of samples. Antimony, boron, mercury, molybdenum, silver, thallium, and tin had FODs below 60 percent. Bismuth was not detected in any samples.

Aluminum, calcium, iron, and magnesium were detected at the highest concentrations (mean concentrations of 16,000 mg/kg, 4,700 mg/kg, 18,600 mg/kg, and 8,500 mg/kg, respectively). All other trace elements had mean concentrations below 600 mg/kg. The NOCs with the lowest mean concentrations were mercury, thallium, cadmium, beryllium, tin, antimony, and silver (mean concentrations ranging from 0.015 mg/kg for mercury to 0.60 mg/kg for tin.

Generally, concentrations of analytes varied among the sample locations, as shown in the box-and-whisker plots (Appendix 35.2B). The lowest mean barium concentrations were for Pond 6 (13.6 mg/kg) and PSD (15.6 mg/kg). The mean barium concentration for location GS22 (103 mg/kg) was substantially higher than that for the other locations (mean concentrations ranging from 13.6 to 74.6 mg/kg). For potassium also, the lowest mean concentration was for Pond 6 (67 mg/kg) and the highest was for GS22 (1,400 mg/kg); the other locations had mean potassium concentrations ranging from 164 to 999 mg/kg. The mean aluminum concentration for Pond 6 (mean of 7,900 mg/kg) was also much lower relative to other locations (mean concentrations ranging from 10,600 to 28,300 mg/kg). Many other trace elements had lower mean concentrations for Pond 6 than for the stream sampling locations.

Variability (measured as CVs) among trace elements in sediment samples from the Cook Inlet drainages ranged from 0.35 for vanadium to 2.46 for molybdenum (Table 35.2-2). CVs exceeded 1.0 for seven elements. The overall CV for trace elements in Cook Inlet samples was 0.81.

35.2.6.2 Simultaneously Extractable Metals

Sediment samples collected in August 2006 were analyzed for cadmium SEM, copper SEM, lead SEM, mercury SEM, nickel SEM, and zinc SEM. Only mercury SEM was not detected in any of the five samples analyzed (Table 35.2-3). Mean SEM concentrations for cadmium, copper, lead, nickel, and zinc were lower than the mean concentrations determined by the non-SEM analytical method (cadmium SEM 0.11 mg/kg compared to 0.18 mg/kg cadmium; copper SEM 12.3 mg/kg compared to 42.5 mg/kg copper; lead SEM 1.49 mg/kg compared to 2.38 mg/kg lead; nickel SEM 3.26 mg/kg compared to 13.5 mg/kg nickel; and zinc SEM 12.7 mg/kg compared to 47.5 mg/kg zinc). This is expected because sulfur was detected in four of the five samples analyzed for SEMs. Sulfur molecules bind to the molecules of trace elements, thereby reducing the bioavailable concentrations of trace elements that are reflected by the SEM analysis. For example, the lack of mercury SEM detections is interpreted to mean that this metal is not bioavailable in this environment, despite its detected concentrations in five non-SEM samples. For the other five trace elements detected in SEM samples, bioavailable concentrations, as measured by SEM analysis, are lower than concentrations determined by total metals analysis.

Except for nickel, SEM results generally showed higher variability than the results for total metals analysis, although all of the five detected SEMs had a CV of less than 1.0 (Table 35.2-3). The mean CV across detected SEMs was 0.81.

35.2.6.3 Anions and Cations

All anions and cations for which samples were analyzed were detected above MDLs in at least some sediment samples. Sodium and sulfate were detected in all 19 samples. Chloride and ammonia (as nitrogen) were detected in 68 and 89 percent of samples, respectively. Cyanide and fluoride were detected in less than 50 percent of the samples. Total sulfur was detected in all four samples that were analyzed for it.

Sodium, sulfur, and ammonia (as nitrogen) had the highest mean concentrations among the cations and anions at 398 mg/kg, 190 mg/kg, and 95.5 mg/kg, respectively. Cyanide and fluoride had the lowest mean concentrations at 1.48 mg/kg and 0.38 mg/kg, respectively.

Most anions and cations showed high variability, with CVs greater than 1.0 for five of the seven analytes in this group. Only sodium and sulfur had CVs less than 1.0, and the CV for sodium was very close to 1.0 (0.94). The highest variability was for chloride (CV of 4.24), and the lowest was for sulfur (CV of 0.23).

35.2.7 Summary

The Cook Inlet drainages study area for NOCs in sediment encompasses the area between the western Cook Inlet drainages boundary and Iniskin Bay and includes both coastal and upland sampling locations (Figure 35.1-1). The objective of this study was to determine baseline concentrations of NOCs in stream and pond sediments in the Cook Inlet drainages study area. Sample-collection and analytical methods were similar to those described for mine study area (Chapter 10).

Sampling was conducted in 2004 through 2007. Nine locations were sampled, and 19 sediment samples were collected and analyzed for trace elements, anions, and cations. In addition, four samples collected in 2006 were also analyzed for total sulfur and AVS, and five samples collected that year were analyzed for SEMs. All NOCs except bismuth, AVS, and mercury SEM were detected in at least some sediment samples. Aluminum, iron, calcium, and magnesium had the highest mean concentrations, and mercury had the lowest mean concentration. SEM concentrations were generally lower than the corresponding concentrations determined by the non-SEM analytical method for those elements.

35.2.8 Glossary

Bioavailability—the relative amount of a trace element or compound that can be absorbed by an organism.

35.3 Freshwater Fish Tissue

35.3.1 Introduction

This section presents the findings of the trace elements study for fish from freshwater streams in the Cook Inlet drainages.

35.3.2 Study Objectives

The objectives of this study were to determine baseline concentrations of NOCs in the tissues of fish from freshwater streams in the Cook Inlet drainages study area.

35.3.3 Study Area

The Cook Inlet drainages study area for NOCs in fish tissue comprises two streams on the Iniskin Peninsula—Y-Valley Creek and an unnamed creek the flows into upper Iniskin Bay (Figure 35.1-1). Y-Valley Creek is the main freshwater ecosystem in the Cook Inlet drainages study area.

35.3.4 Scope of Work

The 2004 and 2005 fish sampling efforts, as described below, were conducted by HDR, Inc.:

- Collection of 11whole-body samples of Dolly Varden (*Salvelinus malma*) in September 2004 from an unnamed creek in northern Iniskin Bay, and analysis for antimony, arsenic, cadmium, copper, lead, total mercury, nickel, selenium, and silver.
- Collection of 11 whole-body samples of coho salmon (*Oncorhynchus kisutch*) in September 2004 from Y-Valley Creek, and analysis for antimony, arsenic, cadmium, copper, lead, total mercury, nickel, selenium, and silver.
- Collection of 10 whole-body samples of Dolly Varden (*Salvelinus malma*) in August 2005 from Y-Valley Creek, and analysis for the nine analytes from 2004 plus beryllium, chromium, molybdenum, thallium, and zinc.

35.3.5 Methods

35.3.5.1 Sample Collection

In general, methods for sample collection were consistent with those outlined in the consolidated study plan (Appendix E of this environmental baseline document) and in the field sampling plans for the fish studies (Appendix F of this environmental baseline document). The collection methods used in the Cook Inlet drainages were the same as those for the mine study area in the Bristol Bay drainages (Chapter 10), except all samples collected in the Cook Inlet drainages were whole-body samples (no separate liver or muscle tissues were collected).

Coho salmon was initially the target species for the study, when present, with Dolly Varden to be collected when coho salmon were absent or rare. In 2005, the target species for Y-Valley Creek was changed from coho salmon to Dolly Varden because not enough coho salmon were present during the sampling period in 2005. In all cases, sampled fish were juvenile or young-of-the-year that had remained in their home creek since birth.

In 2004 sampling occurred at both the unnamed creek and Y-Valley Creek. In 2005, sampling occurred only at Y-Valley Creek.

As noted above, in 2004 samples were analyzed for antimony, arsenic, cadmium, copper, lead, total mercury, nickel, selenium, and silver. Analyses for beryllium, chromium, molybdenum, thallium, and zinc were added in 2005 to be more consistent with trace element sampling in other media.

35.3.5.2 Data Reduction

This section summarizes how the raw data were processed and used for data evaluation. Data for the unnamed creek for 2004, Y-Valley Creek for 2005, and Y-Valley Creek for 2005 were treated as three separate data sets. The following summary statistics were compiled for each of these data sets:

- FODs.
- Minimum and maximum detected concentrations.
- Minimum and maximum MDLs and MRLs.
- Mean and median concentrations.

- Standard deviations and CVs.

Only primary sample data were used for analyses. Non-detect results (analyte not detected above MDL) were included in statistical analyses as one-half the MDL, and non-detect results flagged with a “U” or “UJ” qualifier were included as one-half the MRL.

35.3.6 Results and Discussion

Summary statistics for the fish samples are shown by stream and year in Tables 35.3-1 through 35.3-3. Laboratory data for fish samples collected in 2004 and 2005 are presented in Appendix 35.3A. All data are presented on a dry weight basis, with the exception of percent solids, which are presented on a wet weight basis. For elements for which samples were analyzed in both years, bar graphs showing mean concentrations in each data set are presented in Figures 35.3-1 through 35.3-9.

All NOCs for which samples were analyzed were detected in at least some fish samples (Table 35.3-1). All NOCs for which samples were analyzed except antimony and silver were detected in at least 70 percent of fish samples from each creek during each year (Table 35.3-2 through 35.3-4). Antimony was detected in only one sample from each sampling event at each creek. Silver was detected in 55 percent of the samples from Y-Valley Creek in 2004, although the other FODs for silver were greater than 90 percent.

Among the nine NOCs for which all samples were analyzed, copper was present at the highest mean concentrations (6.23 mg/kg to 7.65 mg/kg; Figure 35.3-4). Nickel (mean concentrations from 1.19 to 6.23 mg/kg; Figure 35.3-7) and selenium (mean concentrations from 1.22 mg/kg to 3.33 mg/kg; Figure 35.3-8) had the next highest concentrations. Mean arsenic concentrations ranged from 0.34 mg/kg to 0.63 mg/kg (Figure 35.3-2). The mean concentrations for antimony (Figure 35.3-1), cadmium (Figure 35.3-3), lead (Figure 35.3-5), mercury (Figure 35.3-6), and silver (Figure 35.3-9) all were below 0.20 mg/kg.

35.3.6.1 2004 Results

In 2004, coho salmon were collected from Y-Valley Creek, no other fish species were caught during the 2004 fish collection effort. In these2004 coho salmon samples from Y-Valley Creek, seven of the nine measured NOCs (all except antimony and silver) were detected above the MDL in all 11 samples (Table 35.3-2). The relative concentrations of NOCs were consistent with the overall pattern described above. The variability, measured as the CV, was low (less than 0.7) for all constituents except silver. CVs ranged from 0.21 (selenium) to 2.91 (silver). The CV for silver was more than four times higher than any other CV. The overall CV for trace element concentrations for Y-Valley Creek coho salmon was 0.66.

In 2004, Dolly Varden were collected from the unnamed creek, no other fish species were caught during the 2004 fish collection effort. In these Dolly Varden samples from the unnamed creek, six of the nine measured NOCs were detected above the MDL in all 11 samples (Table 35.3-3). Silver was detected in 91 percent of samples, cadmium in 73 percent, and antimony in only nine percent (1 of 11) of samples. The relative concentrations of NOCs were consistent with the overall pattern described above. The variability, measured as the CV, was low (less than 0.95) for all constituents. CVs ranged from 0.22 (selenium) to 0.92 (nickel). The overall CV for trace element concentrations in Dolly Varden from the unnamed creek was 0.49.

35.3.6.2 2005 Results

In 2005, Dolly Varden were collected from Y-Valley Creek, no other fish species were caught during the 2005 fish collection effort. Of these Dolly Varden samples from Y-Valley Creek, 10 of the 14 measured NOCs were detected above the MDL in all 10 samples (Table 35.3-4). The FODs for lead, thallium, beryllium, and antimony were 90, 80, 70, and 10 percent, respectively.

The 2005 Dolly Varden concentrations from Y-Valley Creek for the nine NOCs measured in both 2004 and 2005 were consistent with the overall pattern described above, but the mean concentrations for copper, nickel, and selenium all were highest for the 2005 samples. Among the five NOCs for which analyses were performed only in 2005 (Table 35.3-4), zinc had the highest mean concentration at 151 mg/kg, which is much higher than the concentrations for copper (which had the next highest concentrations) for any samples. Zinc is an essential nutrient for fish, and fish have active uptake and homeostatic mechanisms in place to handle a wide range of concentrations. (Homeostatic mechanisms allow an organism to maintain equilibrium by adjusting internal systems [e.g., acid/base balance] to compensate for variations in external conditions, such as concentrations of elements. Fish homeostatic mechanisms for trace elements may include regulated storage and detoxification.) The next highest mean concentration among the five 2005-only analytes was for chromium at 5.96 mg/kg. Mean concentrations for the other three 2005-only analytes (beryllium, molybdenum, and thallium) were below 0.20 mg/kg.

Variability, as measured by the CV, was low for all but two the 14 constituents. Nickel and chromium each had a CV greater than 1.0 (Table 35.3-4). CVs ranged from 0.096 (zinc) to 1.08 (chromium). The overall CV for NOCs in Dolly Varden from Y-Valley Creek was 0.51.

35.3.6.3 Comparison of Fish Tissue Concentrations across Years and Rivers

Mean concentrations of lead were higher in fish samples from Y-Valley Creek from both years (0.15 mg/kg for 2004 and 0.098 mg/kg for 2005) than those from the unnamed creek (0.041 mg/kg), regardless of fish species. This difference may be related to the concentrations of lead in sediment in each creek. (Higher concentrations in sediment are often associated with higher concentrations in fish as a result of uptake through the diet and direct ingestion of sediment.); however, creek sediment data are not available from the unnamed creek to confirm this hypothesis. The mean concentration for nickel in Dolly Varden samples from Y-Valley Creek in 2005 (6.23 mg/kg) was roughly 5 times higher than the 2004 mean concentrations for either coho salmon samples from Y-Valley Creek (1.19 mg/kg) or Dolly Varden samples from the unnamed creek (1.27 mg/kg). Selenium also had a much higher (roughly 2.5 times higher) mean concentration for samples from Y-Valley Creek in 2005 (3.33 mg/kg) than for the 2004 samples from either Y-Valley Creek (1.22 mg/kg) or the unnamed creek (1.30 mg/kg). These differences may be due to differences in uptake between species within Y-Valley Creek or to annual variability. The mean silver concentration was more than 3 times higher for coho salmon from Y-Valley Creek (0.03 mg/kg) than for Dolly Varden from either creek (0.0088 mg/kg for the unnamed creek and 0.0096 for Y-Valley Creek); these differences are likely due to species-specific differences in the uptake of silver. The greatest differences were for cadmium. The mean cadmium concentration for Dolly Varden from Y-Valley Creek in 2005 (0.15 mg/kg) was more than 16 times higher than that for Dolly Varden from the unnamed creek in 2004 (0.0091 mg/kg). In addition, the mean cadmium concentration for coho salmon from Y-Valley Creek in 2004 (0.054 mg/kg) was nearly 3 times lower than the mean for Dolly Varden from the same creek in 2005 (0.15 mg/kg), and the mean cadmium concentration for Dolly Varden from the unnamed creek in 2004 (0.0091 mg/kg) was almost 6 times lower than that for coho salmon from Y-

Valley Creek in the same year (0.054 mg/kg). These differences are likely due to differences both between species and between waterbodies; annual variability likely plays no more than a minor role in these scenarios.

Different fish species from different streams in the Cook Inlet drainages study area had different natural levels of some trace elements.

35.3.7 Summary

The Cook Inlet drainages study area for NOCs in fish tissue comprises two streams on the Iniskin Peninsula—Y-Valley Creek and an unnamed creek the flows into upper Iniskin Bay. The primary objective of the study was to determine baseline concentrations of NOCs in the tissues of fish from freshwater streams in the Cook Inlet drainages study area. Sampling methods were similar to those described for the mine study area in the Bristol Bay drainages (Chapter 10).

Samples were collected from the unnamed creek during only one sampling event in 2004, while samples were collected from Y-Valley Creek once in 2004 and once in 2005. In those two years combined, 21 Dolly Varden and 11 coho salmon were collected from the streams. Samples from 2004 were analyzed for nine trace elements, and samples from 2005 were analyzed for those nine plus five additional trace elements (Tables 35.3-2 through 35.3-4). All elements for which analyses were performed were detected in at least some fish samples (Table 35.3-1).

Zinc was detected in fish samples at the highest concentrations (mean of 151 mg/kg), although analysis for zinc was performed only on samples collected in 2005. Among the trace elements for which all samples were analyzed, copper had the highest mean concentrations (means ranging from 6.23 mg/kg to 7.65 mg/kg) and antimony had the lowest (ranging from 0.0027 mg/kg to 0.0044 mg/kg).

35.4 Marine

35.4.1 Introduction

Intertidal and subtidal habitats in lower Cook Inlet support diverse populations of numerous species of finfish, invertebrates, and marine vegetation of ecological and economic importance. Recent studies were undertaken for the Pebble Project to characterize and document existing chemical conditions in sediments and in the tissues of organisms present in these habitats.

The following sections describe the environmental chemistry in Iniskin and Iliamna bays, as determined based on existing literature and on field investigations conducted in 2004, 2005, and 2008. Iniskin and Iliamna bays comprise one of several estuarine complexes and embayments along the west side of lower Cook Inlet. In this document the two bays are collectively termed the Iniskin and Iliamna Estuary, or IIE. The focus of the trace elements study in the IIE was on nearshore areas (Figure 35.4-1).

Field work conducted over three seasons allowed an expanding understanding of the habitat and biota of the IIE. That enhanced understanding, in turn, informed refinements in the approach to assessing spatial variability, i.e., over time, the evaluation of temporal variability played a lesser role in the study design. This study also compared results of the field work to available data on trace elements in sediment and biological tissue in areas of lower Cook Inlet and elsewhere. The study results also were compared to established threshold concentrations for biological response.

35.4.2 Study Objectives

The objectives of the marine portions of the trace elements program were as follows:

- Collect baseline data to provide scientific documentation of the existing levels of chemical constituents in marine sediment and biotic tissue in the IIE.
- Evaluate the baseline data to identify major factors influencing the spatial distributions of the constituents.
- Characterize marine sediment and biotic tissue—including analysis of physical and chemical parameters, inorganic constituents, and patterns of petroleum-hydrocarbon concentrations to identify patterns that may exist related to geography or substrate type.

35.4.3 Study Area

The study area encompasses the intertidal, subtidal, and nearshore habitats of the IIE (Figure 35.4-1).

35.4.4 Previous Studies

Blasko (1976) documented nine oil wells drilled on the Iniskin Peninsula between 1902 and 1961. The Iniskin Peninsula forms the southeast shore of Iniskin Bay, and all of these wells were on the Oil Bay side of the drainage divide on the Iniskin Peninsula. Oil Bay is a small embayment about 2 nautical miles (3 kilometers [km]) east of Iniskin Bay; the drainage divide zigzags along the peninsula, but is generally closer to Oil Bay than to Iniskin Bay. All of the wells were listed as plugged and abandoned in Blasko's report. Historical activity in the Oil Bay drainage was intense enough, however, to cause crews to transport and then leave an old boiler by the abandoned wells, which was observed by Blasko (1976). He reported observing several oil seeps on land just northwest of Oil Bay.

Little scientific investigation had occurred on the west side of lower Cook Inlet or in the IIE area before initiation of the National Oceanic and Atmospheric Administration's (NOAA's) Outer Continental Shelf Environmental Assessment Program (OCSEAP) in the mid-1970s. As part of OCSEAP, Burrell (1978, 1979) conducted two studies of environmental conditions in lower Cook Inlet. He collected and analyzed sediment samples from two locations near the IIE—one 9 nautical miles (17 km) east of the IIE and one 15 nautical miles (28 km) to the east. Burrell's analyte suite included only six analytes also studied for Pebble Project, but his analyses provided some data for comparison. He also collected tissue samples of invertebrate and fish species present in lower Cook Inlet. His study measured four inorganic substances in the clam *Macoma* sp. in Iliamna and Iniskin bays and the mussel *Mytilus trossulus* in Oil Bay, an embayment about 6 nautical miles (11 km) east-northeast of Pebble sampling location MOPP1 (Figure 35.4-2a). The Iliamna Bay location was in Cottonwood Bay—a westward extension of Iliamna Bay, and the Iniskin Bay location was about 4 nautical miles (7 km) north-northeast of Pebble intertidal-tissue sampling location MPS2 (Figure 35.4-2b). Burrell's fish samples were muscle tissue from flathead sole. The fish sampling location closest to the IIE was in eastern Cook Inlet about 50 nautical miles (93 km) east-southeast of the IIE. Burrell stated that the primary objective of his program was "to research natural pathways of potentially toxic heavy metals to and through Alaskan Shelf and coastal marine biota (with emphasis on commercially important benthic species)" (Burrell, 1979). While Burrell's study has direct relevance to the Pebble Project research in that the media and analytes overlap and the locations are close, Burrell's work was performed over 30 years ago and it is possible that environmental conditions in the IIE have changed since then.

Also as part of OCSEAP, Shaw (1981) states that evidence from chemical analysis of sediment samples from Kamishak Bay (south of the IIE) indicated the presence of both compounds derived from fossils (i.e., oil and coal, which are "petrogenic" or petroleum-derived hydrocarbons) and combustion-derived compounds. According to Shaw, this pattern differs from one observed in a sediment sample from Port Valdez, which contained only combustion-derived compounds. Shaw (1981) also makes a case that there was no evidence of petroleum derivatives (oil) in a sediment sample from Iniskin Bay, despite an extensive historical record of petroleum seeps in the area.

Boehm (1998) performed a literature synthesis to describe the oceanographic processes that would govern the transport of potential oil-industry-related contaminants and an analysis of potential local and regional sources of contaminants in Shelikof Strait and lower Cook Inlet. He estimated the natural and human-related inputs of inorganic constituents, described the biological resources at risk, summarized knowledge about the transportational and depositional processes in the area, and summarized existing information about concentrations of hydrocarbons and inorganic constituents in sediment.

Lees et al. (1999) reviewed existing data while evaluating an environmental monitoring program for the Cook Inlet Regional Citizens Advisory Council (CIRCAC). The resulting report compiles data for sediments and clam tissue in Kamishak Bay and describes values for concentrations of constituents potentially related to oil and gas activities, among other data. Lees et al. (1999) provides a list of "[p]otential reported sources of petrogenic PAHs [polynuclear aromatic hydrocarbons] in the Cook Inlet study areas include: Cook Inlet crude oil from production and shipping operations; produced water discharges; Alaska North Slope (ANS) crude oil including EXXON VALDEZ Oil Spill (EVOS) residues; refined petroleum products (fuel oil, diesel, etc.); and seep oils from Oil Bay (and elsewhere) within Cook Inlet, as well as Katalla, Yakataga, and other eastern Gulf of Alaska seeps."

Some of the most comprehensive environmental data available were collected during the summer of 2002 for the Alaska Monitoring and Assessment Program (AKMAP) undertaken by the State of Alaska, NOAA, and the U.S. Environmental Protection Agency (Saupe et al., 2005). The program measured a broad range of variables in the water column, sediments, biota, and biological communities. The two sampling locations closest to the IIE, however, were on the opposite side of Kamishak Bay—about 30 nautical miles (56 km) south of the IIE—and in Chinitna Bay—a shallow embayment about 18 (33 km) nautical miles northeast of the IIE. While Chinitna Bay is not far from the IIE by a direct overland route, it has a different orientation to Cook Inlet and, therefore, may be subject to different transport patterns than the IIE. These circumstances do not preclude using the data for comparison with data for Pebble Project, especially when the AKMAP study covered such an extensive suite of analytes. The AKMAP study is the most comprehensive and recent investigation for which data are available; the circumstances described in this paragraph illustrate some of the variability that always occurs in seeking to compare environmental data sets.

The NOAA Mussel Watch program (Lauenstein and Cantillo, 1993) has established monitoring locations in Cook Inlet with some data collected first in 1995 and then at approximately 2-year intervals. Mussels from Homer Spit and Ninilchik have been sampled and analyzed for this program; however, those locations would be expected to show effects of human development. The monitoring location closest to the IIE, but removed from greater human-caused effects, is English Bay, on the west side of the Kenai Peninsula. The English Bay location is across Cook Inlet about 50 nautical miles (93 km) east-southeast of the IIE and was most recently sampled in 2007 (NOAA, 2011).

The Alaska Department of Environmental Conservation (ADEC) established a fish monitoring program (FMP) for a variety of marine species, including all five species of Pacific salmon (ADEC, 2007). The sample collection for the FMP began in 2001 and has featured annual sampling of a variety of taxa. The FMP analyzed skinless fillet samples because it focused on human consumption. The suite of analytes included seven inorganic constituents that also were tested for in the Pebble Project study.

35.4.5 Scope of Work

The investigation of key chemical constituents in marine sediments and biotic tissue from the IIE was conducted in conjunction with other baseline studies for marine water (Chapter 34), marine habitat (Chapter 36), intertidal and subtidal benthos (Chapter 42), and marine fish (Chapter 43). The 2004 and 2005 sample-collection efforts were conducted by Bristol Environmental and Engineering Services Corporation and Pentec Environmental; the 2008 sampling was conducted exclusively by Pentec.

The following scope of work was conducted for the IIE in 2004:

- Collection of 11 intertidal sediment samples and 17 subtidal sediment samples.
- Collection of 15 samples of invertebrate tissue and six fish-tissue samples.

The following scope of work was conducted for the IIE in 2005:

- Collection of seven intertidal sediment samples.
- Collection of 10 fish-tissue samples.

The following scope of work was conducted for the IIE in 2008:

- Collection of eight intertidal sediment samples and 16 subtidal sediment samples.
- Collection of 8 plant-tissue samples, 8 invertebrate-tissue samples, and 55 fish-tissue samples.

The numbers of samples collected annually are summarized by sample type and location in Table 35.4-1. The parameters for which the samples were analyzed are shown in Tables 35.4-2 and 35.4--3, for sediment, and Tables 35.4-4 and 35.4-3, for tissue.

35.4.6 Methods

Each of the 3 years of field work was conducted using slightly different approaches to data gathering. In 2004, both intertidal and subtidal sediments were sampled. Because the IIE did not have a history of previous biotic sampling and chemical analysis of the samples, the tissue sampling in 2004 was performed opportunistically and covered a range of fish and invertebrate species and tissue types. The constituents for which the 2004 samples were analyzed were primarily inorganic constituents (trace elements, and anions and cations). In 2005, supplementary sediment sampling was performed at intertidal locations (Table 35.4-1) and an expanded set of analytes, including organic compounds, was measured (Table 35.4-2). Additional tissue samples that year focused on fish (Table 35.4-1), but the analytes measured were as in the previous year—inorganic constituents (Table 35.4-4). In 2008, most of the previous intertidal sediment locations were sampled, and subtidal locations with multiple samples were visited again (Table 35.4-1). The analyte suite for sediments included inorganic constituents and a set of aliphatic (open-chained) hydrocarbons (AHCs) and PAHs (Tables 35.4-2 and 35.4-3) that could be used to investigate the origins of hydrocarbons detected in the sediment samples. Tissue sampling that year comprised one plant species, one invertebrate species, and six species of fish. Multiple samples of each were collected to provide a more rigorous documentation of NOC concentrations in the media. The analyte suite for tissue included inorganic constituents for all samples and AHCs and PAHs for invertebrates (Tables 35.4-4 and 35.4-3).

For some constituents measured in sediment, threshold concentrations for biological response have been established and compiled in Screening Quick Reference Tables (SQuiRT; Buchman, 2008). Where these concentrations are available, the minimum value was generally chosen for comparison with results obtained in this study. For some constituents, concentrations measured in other studies are available and have been compiled to compare with data from this study.

35.4.6.1 Marine Sediments

Sampling of marine sediments was conducted in both intertidal and subtidal habitats. Sediments were collected from 13 locations in 2004, 2005, and/or 2008 (Table 35.4-1 and Figure 35.4-2a). Analyte suites covered a variety of inorganic constituents and organic compounds, as well as basic physical and chemical properties.

The investigation focused on surface sediments; however, samples were collected from the subsurface sediment layer (more than 10 cm below the sediment/water interface) at some locations in the 2008 season.

Sample handling and analyses were conducted in accordance with the annual Pebble Project quality assurance project plans (QAPPs; Appendix G of this environmental baseline document).

Sampling Stations

Locations sampled for analysis of marine sediments in the IIE are shown on (Figure 35.4-2a). Note that the station location nomenclature structure was refined over time; as a result sample station location identification codes differ slightly between data presented in tables, graphs and maps and the data presented in Appendix 35.4A. A key to station location identification codes may be found in Appendix 35.4A3.

Intertidal sediment sampling was conducted at soft-bottomed locations—station MPSE near the existing port site of Williamsport (MPSE) and seven additional stations (MPS1 through MPS4, MBSA1, MPS1A, and MBB; Figure 35.4-2a). The letters “M” or “L” were added to the station identification codes, when appropriate, to signify middle or lower intertidal elevations, respectively (e.g., MPS3M indicates the middle elevation at station MPS3).

Stations sampled for subtidal sediments were MPS1, MPS2, MPS4 (MPS3 was inaccessible because of the shallow water depth at that location compared to the draft of the survey vessel), MOPP1, and MWGI (the latter two were sampled as locations of opportunity).

Subtidal stations were located with global positioning system coordinates. For intertidal stations, global positioning system coordinates were recorded and locations were marked with rebar stakes or by other means (e.g., large boulder or photographs) to aid re-location in subsequent years.

Sediment Collection and Sample Preparation

Sample collection and analyses in 2004 were as follows (Tables 35.4-1 and 35.4-2):

- Collection of surface sediment from middle and lower elevations at five intertidal stations and analysis for a full suite of inorganic constituents and select organic constituents; collection of one sample at an additional intertidal station and analysis for grain size only.
- Collection of multiple samples of surface sediment each from three subtidal stations and one sample from an additional subtidal station, and analyses for a full suite of inorganic constituents and select organic constituents; collection of surface sediment at one station and analysis for inorganic constituents only.

Sample collection and analyses in 2005 were as follows (Tables 35.4-1 and 35.4-2):

- Repeat sampling of surface sediment at five intertidal stations and sampling at two additional intertidal stations, and analysis for inorganic and extended organic constituents.
- No subtidal sediment collection was performed in 2005.

Sample collection and analyses in 2008 were as follows (Tables 35.4-1, 35.4-2, and 35.4-3):

- Repeat sampling of surface sediment at six intertidal stations and sampling of subsurface sediment (more than 10 cm below the sediment/water interface) at two of those stations, and analysis for select inorganic constituents and for AHCs and PAHs.
- Repeat sampling of surface sediment at three stations sampled in 2004 and collection of subsurface sediment at one of those stations, and analysis for select inorganic constituents and for AHCs and PAHs.

To obtain intertidal samples, a tape was first laid out parallel to the beach contour. At five to seven randomly selected points along the tape the field crew used a core sampler to collect sediment for analyses for grain size (measured as percent fines) and total organic carbon (TOC). At each of the core locations on a given intertidal transect, two sediment samples were collected from the top 2 centimeters of undisturbed sediment adjacent to the core. Each sample pair was combined into one composite sample. In 2008, subsurface samples were obtained from 10 cm or more below the air/sediment interface at two intertidal stations (MPS3 and MBB). The field crew decontaminated the compositing bowl and sample processing utensils between locations or strata.

In 2004, three subtidal sample stations were located offshore of intertidal stations of the same designation and at two historically sampled stations (MOPP1 and MWGI). GPS coordinates were taken for station re-location in 2008. The field crew collected subtidal sediments with a 0.1-square-meter Van Veen grab sampler. With the exception of single samples at MGWI and MOPP1 in 2004, five or more replicate samples were collected at each sampling station. Successful grabs were determined by four criteria: the sampler was not overfilled, overlying water was present, the surface of the material in the grab was flat, and the water in the grab was not excessively turbid. Sediment characteristics, including appearance and smell, were recorded on the collection log. Surface sediments (0 to 4 cm below the sediment surface) were removed from the sampler by stainless-steel spoon and placed in a stainless-steel bowl to be homogenized. The homogenized sediment was spooned into sample containers specified or provided by the lab; samples were prepared without preservative. Subsurface sediments were collected by spoon from the stratum 10 to 13 cm below the water/sediment interface. Owing to the properties of the sediment at most sampling stations—the sampler does not penetrate as far in coarse sediment—a subsurface sediment sample could be obtained only from station MPS1.

After collection, all samples were packed with ice in coolers and shipped to Shaw Environmental in Anchorage for delivery to the analytical laboratories, as prescribed in the annual quality assurance project plans (Appendix G of this environmental baseline document).

Analytes

Sediment samples from most sampling events were analyzed for inorganic analytes, TOC, grain size, nutrients, and organic compounds. The list of analytes was modified over the course of the sampling program (Tables 35.4-2 and 35.4-3). Full descriptions of sampling and analysis methods and quality assurance techniques are available in the consolidated study program (Appendix E of this environmental baseline document), the field study plans for the marine study (Appendix F), and the quality assurance project plans (Appendix G).

35.4.6.2 Biotic Tissues

The sampling program for biotic tissues was refined over time based on knowledge of the spatial and temporal distribution of the biota in IIE gained over three field seasons.

Sampling Stations

The plant and invertebrate species sampled have limited mobility and were collected at MPS1 through MPS4, MPS1B, and in the vicinity of Williamsport (MPSE; Table 35.4-1 and Figure 35.4-2b). Note that the station location nomenclature structure was refined over time; as a result sample station location identification codes differ slightly between data presented in tables, graphs, and maps and data presented in Appendix 35.4C. A key to station location identification codes may be found in Appendix 35.4C3.

Given the mobility of the fish species collected, the primary distinction among fish collection locations was whether they were in Iliamna Bay or in Iniskin Bay (Table 35.4-1). In addition, fish samples were collected near the mouth of Y-Valley Creek (stations MYVCM and MYVL), which is located between the two bays (Figure 35.4-2). The fish sampling program in the Y-Valley Creek area was different from sampling in the two bays because it comprised almost entirely adult Dolly Varden (*Salvelinus malma*); collection in the bays generally comprised adults of other species and juvenile Dolly Varden. The fish samples from the Y-Valley Creek area, therefore, were not grouped with the fish samples from Iliamna Bay or Iniskin Bay.

Species

Collection of biotic tissues for chemical analysis during the 2004 and 2005 field seasons was based largely on opportunistic sampling of species. Invertebrates predominated in 2004, and supplemental collection of fish species was performed in 2005.

In 2008, sample collection centered on eight species that were available in the IIE during the sample-collection season, that contributed substantially to the biomass or trophic relationships in the IIE, or that were perceived to be of importance to humans. The 2008 program included collecting multiple samples over time and space to better reflect the status of the populations in the IIE. The species/life stages of plants, invertebrates, and fish described below were selected for tissue analyses from among those species present and collected:

- Rockweed (*Fucus distichus* ssp. *evanescens*). This algal species is an important primary producer of organic matter in the IIE. The organic matter it produces sustains detritivores (organisms that consume decomposing organic matter, or detritus), which serve as food for salmonids and other organisms at higher trophic levels. Rockweed also appears to be a preferred macroalga for the deposition of spawn by Pacific herring in the IIE.
- Mussel (*Mytilus trossulus*). This invertebrate species is widely used in environmental monitoring, and there is an established protocol for sample collection for this species. Because they are sessile filter feeders, mussel tissue analyses provide a cumulative record of environmental conditions in IIE.
- Juvenile Dolly Varden. Juveniles of this fish species are abundant in the IIE and generally stay close to natal streams; therefore, study of juvenile Dolly Varden can provide a good indication of exposure to conditions in the IIE.
- Adult Dolly Varden. This species is taxonomically and physiologically representative of salmonids, but is more available in the IIE than species of Pacific salmon. It is also a top predator, preying on crustaceans and small fish.
- Adult Pacific halibut (*Hippolglossus stenolepis*). As a demersal fish, this species is expected to have greater exposure to environmental conditions in sediments and the lower portion of the water column. Individuals of this species collected during the Pebble sampling may have had a larger range than the IIE. This is a desirable species for human consumption.
- Starry flounder (*Platichthys stellatus*). This is a demersal species distributed principally in Iliamna Bay.
- Yellowfin sole (*Limanda aspera*). This is a demersal species distributed principally in Iniskin Bay.
- Adult chum salmon (*Oncorhynchus keta*) and pink salmon (*O. gorbuscha*), when available. While adult salmon have spent the majority of their lives outside the IIE, they were sampled because they are desirable species for human consumption.

Starry flounder and yellowfin sole are similarly sized groundfish, but because they reside in different bays of the IIE, each was characterized separately.

The rationale for this sampling approach was to cover a variety of species with relatively large populations that represented the taxonomic and trophic variety in the IIE. The intent was to sample a number of individuals from each species and, in the case of sessile populations (e.g., mussels), to sample over the period of biological activity (May through September). (Table 35.4-5 is a list of all the species sampled, with their common and scientific names.)

Tissue Collection and Sample Preparation

Sample collection and analyses in 2004 were as follows (Tables 35.4-1 and 35.4-4):

- Collection of five invertebrate whole-body samples at three stations in Iliamna Bay and 10 invertebrate samples at three stations in Iniskin Bay, and analysis for inorganic constituents.
- Collection of a chum salmon from Iliamna Bay, and analysis of one liver and one muscle sample for inorganic constituents.
- Collection of one greenling whole-body sample and two sculpin whole-body samples from Iniskin Bay, and analysis for inorganic constituents.

Sample collection and analyses in 2005 were as follows (Tables 35.4-1 and 35.4-4):

- Collection of nine whole-body fish samples (four species) from Iliamna Bay and two whole-body fish samples (two species) from Iniskin Bay, and analysis for inorganic constituents.

Sample collection and analyses in 2008 were as follows (Tables 35.4-1, 35.4-4, 35.4-3):

- Collection of four plant samples at two stations in Iliamna Bay and four plant samples at two stations in Iniskin Bay, and analysis for inorganic constituents.
- Collection of four mussel samples (plus one field replicate) at two stations in Iliamna Bay and four mussel samples (plus one field replicate) at three stations in Iniskin Bay, and analysis for inorganic constituents, AHCs, and PAHs.
- Collection of 16 whole-body fish samples (two species) and 12 muscle samples (three species) from Iliamna Bay, and analysis for inorganic constituents.
- Collection of 13 whole-body fish samples (two species) and 6 muscle samples (one species) from Iniskin Bay, and analysis for inorganic constituents.
- Collection of eight whole-body fish samples (three species) from the mouth of Y-Valley Creek, and analysis for inorganic constituents.

Collection of organisms for analysis of biotic tissues was done using a variety of techniques.

For rockweed the crew collected fronds from 10 individual plants at a given sampling station and placed them in a plastic bag. The collected fronds from each station were prepared as a composite for laboratory analysis.

For invertebrates sampled in 2004 sufficient biomass was collected to produce a sample. For invertebrates (mussels) sampled in 2008 the crew collected at least 10 individuals. The mussels were generally small in size and were consistently found at each station; therefore enough animals could be collected at each station to obtain approximately 25 grams of tissue, although the individuals were collected over a wide area at each station. Animals were counted and identified by species and placed in a plastic bag, and the date and collection location were noted. The collected animals of each species from each station were prepared as a composite for laboratory analysis.

Fish samples were collected by three primary techniques—beach seine, trawl, and angling—depending on the species or size of fish being sought. Large fish species (e.g., halibut) were collected by angling. Smaller fish and adult salmon were collected by beach seining. Beach seining was conducted using a standard 120-foot, fine-mesh seine deployed approximately 100 feet offshore and pulled in. To sample demersal fish that may have been missed by other sampling techniques, a 3-meter "try net" otter trawl was used in soft-bottom, subtidal areas; 5-minute tows were taken at each station (see Chapter 43).

Catches from the three methods were identified to species, and Dolly Varden were classified as juvenile or adult. Whole juvenile Dolly Varden were composited to obtain adequate tissue for analysis. The adult Dolly Varden and other larger fish were collected as individuals from which skinless fillets (muscle tissue) were prepared for analysis. One sample in 2004 was prepared from the liver of a chum salmon. Larger fish were generally selected to ensure sufficient tissue for analysis and to increase the chances of collecting older fish that would be representative of longer exposure to conditions in the IIE. In addition, larger fish are considered more likely to be consumed by humans.

All tissue samples were packaged and shipped to the appropriate laboratories in accordance with the annual quality assurance project plans (Appendix G of this environmental baseline document).

Analytes

Samples of biotic tissues were analyzed for inorganic constituents, and mussel samples were additionally analyzed for AHCs and PAHs (Tables 35.4-4 and 35.4-3). A full description of sampling and analysis methods and quality assurance techniques is available in the consolidated study program (Appendix E of this environmental baseline document), the annual field sampling plans for the marine study (Appendix F), and the annual quality assurance project plans (Appendix G).

35.4.6.3 Data Reduction

Only primary sample data were included for the data evaluation; the results for analyses of samples collected for quality assurance and quality control functions were not used in data interpretation. Analytical results that were below the MDL (i.e., non-detect results) were included in the data interpretation as one-half the MDL.

Where field sampling produced multiple samples at one station (e.g., subtidal sediment sampling, or tissue sampling as conducted in 2008), data were pooled and median values were used in the data evaluation to express the central tendency representative of the station. When only single samples were available, the results were evaluated individually. Individual sample results also were used when differences in the basic characteristics of the samples indicated that data should not be pooled. For example, although multiple intertidal sediment samples were taken from some sampling stations, the grain size characteristics can vary a great deal between the middle and the lower tidal elevations; therefore, the individual sample results were evaluated separately for each elevation.

The results of the chemical and statistical analyses for sediment and tissue for Pebble Project were compared with data from other sources in two ways. The first approach was a direct comparison of concentrations for a given medium where similar types of data from other studies were found that could be directly compared with data from the Pebble Project study. In some cases (e.g., concentrations of inorganic constituents in rockweed) the data from other sources were for sites that were distant from the Pebble stations. In other cases (e.g., subtidal sediment) the data were for sites near the Pebble stations, although the different data sets demonstrated variability from one to another. Whether the compared data sets showed similarities or differences, it was useful to compare existing environmental data with the results for the Pebble Project study to evaluate the generality of conditions found in the IIE. The second kind of comparison was to relate Pebble data to thresholds of biological response. These threshold values were compiled in SQuiRT (Buchman, 2008) by a branch of NOAA from a variety of sources in ecological literature. The thresholds are used to evaluate the environmental health of marine habitats, often to assess the need for remedial activity. These values have been compiled for water, soil, and sediment, but not for tissues, and there is no distinction between intertidal and subtidal sediments. The lowest SQuiRT value for each constituent was selected for comparison with the Pebble Project data. The thresholds have no present regulatory application in the IIE.

To understand the origin of hydrocarbon compounds in the IIE, the AHC and PAH profiles for sediment and mussel tissues collected in 2008 were compared to profiles and indices in literature for biogenic (biotic), petrogenic (petroleum), and pyrogenic (combustion) hydrocarbons. In addition to numerical evaluation, the data were graphed to allow evaluation of patterns.

To characterize the concentrations of constituents in fish tissues from the IIE, the samples from 2008 were grouped by species (and age class, in the case of Dolly Varden) and general location—Iliamna Bay, the Y-Valley Creek area, and Iniskin Bay. For the two bays, it was expected that the fish could use the entire bays as habitat and, therefore, finer geographic differentiation would not be useful. Several samples came from the area of Y-Valley Creek mouth, between the two bays; these samples were evaluated together, but separate from those from the bays. For each of the species/area groups, median values of detected concentrations were determined.

The analytical results for the Pebble Project study were reported on a dry weight basis (with the exception of total solids). Results reported in the ADEC FMP were based on wet weight; therefore, the FMP values used for comparison were converted to equivalent dry weight concentrations, based on a wet-to-dry-weight ratio of 5 to 1.

35.4.7 Results and Discussion

The value of marine chemistry efforts undertaken for this environmental baseline study lies in the information they provide future investigators about present conditions in the IIE. Constituents important to the ecology of the IIE are presented below. The results of the analyses for inorganic and organic constituents, and physical and chemical properties are presented in Appendices 35.4A1 (inorganic constituents and total organic carbon in sediment), 35.4A2 (organic compounds in sediment), 35.4B (inorganic constituents in plant tissue), 35.4C1 (inorganic constituents in fish and invertebrate tissues), and 35.4C2 (organic compounds in mussel tissue). This section summarizes environmental conditions represented by some of the important constituents and compares the information in this study to existing environmental data from other sources. The baseline levels for some analytes that may be relevant to the mining industry are highlighted.

The concentrations for the marine trace elements study are expressed in micrograms per kilogram (µg/kg) dry weight, except where noted. (The data for inorganic constituents and for some organic constituents are expressed in the appendices cited above in mg/kg—1 mg/kg is equal to 1,000 µg/kg. The data for some organic constituents are expressed in the appendices as µg/gram [g]—1 µg/g is equal to 1,000 µg/kg.) The primary exceptions are grain size, expressed in percent fines; TOC, expressed in percent; and AVS and SEM, expressed in micromoles per kilogram (µmol/kg). (The purpose for measuring AVS and SEMs is to provide an estimate of the bioavailability of the SEMs. AVS combines with SEMs to make the SEMs unavailable to biota. Because this process occurs at the molecular level, the concentrations of AVS and SEM are expressed in molar concentrations [i.e., µmol/kg]. Molar concentrations are obtained by dividing the "bulk" concentration obtained from laboratory analysis [expressed in mg/kg in Appendix 35.4A1] by the atomic weight of the elements for SEMs and of sulfide for AVS. The atomic weights for the six SEM elements and for sulfide are provided in Appendix 35.4A4.)

In tables and graphs, where applicable, the sampling stations are arranged in order by location from west to east, rather than in alphanumerical order.

Data on marine water quality in the IIE are presented in Chapter 34.

35.4.7.1 Marine Sediments

The marine sediments in the IIE create a heterogeneous benthic habitat. This heterogeneity is observed in physical and chemical characteristics, as well as in concentrations of chemical constituents. In the sections below, unless otherwise noted, the term "sediment(s)" refers to surface sediments, i.e., those in the top few centimeters of the beach or seafloor.

Physical and Chemical Characteristics

The intertidal sampling stations showed heterogeneous spatial and temporal distributions of grain size and percent TOC (Table 35.4-6). On Figures 35.4-3a and 35.4-4a, the spatial distribution pattern is noticeable among stations (e.g., MPSE compared with MBSA1 for grain size and TOC) as well as within stations (e.g., MPS3 for both grain size and TOC, MPS4 for grain size, MPS2 for TOC). The variability within stations is sometimes across tidal elevations (e.g., grain size for MPS3M and MPS3L) and sometimes between sampling events at the same tidal elevation (e.g., grain size for MPS4M in 2004 and 2008; Table 35.4-6). Much of this apparent temporal variability is likely related to imprecise re-location of sample-collection locations from year to year.

In addition to inherent geologically derived spatial heterogeneity, intertidal areas would be expected to vary more from year to year than subtidal areas, because of the year-to-year variability in several physical forces acting on the sediments. Also, intertidal stations may have large seasonal inputs of organic detritus contributed by runoff and aggregations of biotic materials such as algae. These conditions could lead to high concentrations of TOC at places where the sediment is relatively coarse, contravening the typical correlation of high TOC concentrations with fine-grained sediment. All of these influences may affect the distribution of grain size as measured by percent fines and of TOC.

Grain size values for intertidal sediment ranged from 1.1 percent fines for station MPS1M to 95.8 percent for station MPS3L (Table 35.4-6). TOC values for intertidal sediment ranged from 0.11 percent at station MPS1M to 1.28 percent at station MPS3L. This order of magnitude range of values is evident in the low reproducibility between intertidal sampling events. Low reproducibility stems, in part, from differences in exact sample location placement in different sample periods, coupled with high substrate heterogeneity at several intertidal sample stations. The relationship between grain size and TOC has a nonsignificant correlation ($P = 0.18$ and Figure 35.4-5). The high degree of heterogeneity in the intertidal sediments makes it difficult to identify clear trends, but this variability is nonetheless a factor affecting the nature of the infauna assemblages (Chapter 42).

The basic pattern for grain size and TOC at subtidal stations was that relatively nearshore stations (MPS4, MPS1, and MPS2) had finer sediments (contained a higher percentage of fines) and higher concentrations of TOC than did MOPP1, which is farther offshore (Figures 35.4-3b and 35.4-4b). (The sample from MWGI was not analyzed for grain size.) There were much smaller ranges in percent fines and TOC for subtidal stations than for intertidal stations, reflecting the greater homogeneity of sediments in the areas of the subtidal stations. Analysis of the data for subtidal surface sediments shows a highly significant correlation between percent fines and TOC concentration ($P < 0.001$ and Figure 35.4-6).

Because the data for subsurface sediment represented a different sediment domain than the surface samples, they were not included in the regression calculations comparing TOC and percent fines; however, all three of the subsurface sediment samples (two intertidal and one subtidal) plotted below the respective regression lines for surface sediment (Figures 35.4-5 and 35.4-6), suggesting somewhat less TOC for a given percentage of fines than was seen in the surface samples. However, based on visual inspection of the graphs, the data for subsurface sediment do not appear to lie outside the expected range of points based on the data graphed for the surface samples.

Inorganic Constituents

Overall, inorganic constituents were detected at frequencies that allow a reasonable description of their distributions. Also, with the exception of tin, the values used to represent non-detect results were generally below the lowest detected concentrations for each respective analyte, which also supports the following description of constituent distribution. A similar situation arises with AVS and SEM. Cadmium SEM and mercury SEM were not detected in any sample, and some results for AVS, lead SEM, and nickel SEM were below the MDLs. These non-detect results were low relative to the detected concentrations and, therefore, allow for description of the distribution of AVS and SEM.

In the tables summarizing the analytical results for inorganic constituents in sediment (Tables 35.4-6 through 35.4-10), constituents with SQuiRT values ("Part One" constituents) are grouped together, along with the physical and chemical characteristics, and the remaining constituents ("Part Two" constituents) are grouped together. (Analytical results for inorganic constituents in sediment are available in full in Appendix 35.4A1.)

Intertidal Sediments. Concentrations in intertidal sediments of the 11 Part One constituents ranged between tens of µg/kg and tens of thousands of µg/kg (Table 35.4-6). Relatively high concentrations were measured for zinc, copper, and chromium, which were consistently measured at concentrations exceeding 10,000 µg/kg. Relatively low concentrations were measured for mercury and cadmium (all concentrations were 100 µg/kg or less) and silver and antimony (all concentrations were less than 200 µg/kg).

While the range in concentrations for some individual constituents may be considered large (greater than an order of magnitude), the range over the entire table is greater than five orders of magnitude, thus concentrations measured for the Part One constituents reflect wide variations in their environmental distribution. The Part One constituents with smaller ranges of concentrations were cadmium, chromium, nickel, and zinc, where the range in concentrations rounds to a factor of four or less. Concentrations of the Part One inorganic constituents are mapped on Figures 35.4-7a, 35.4-7b, 35.4-8a, and 35.4-8b. One striking feature of these figures is the regularity of the pattern of relative concentrations of the various constituents over the study area. This pattern displays the relatively narrow range of concentrations for individual constituents compared to the overall range of concentrations for all of the constituents shown in the figures. The regularity of this pattern is an indication of the limited sources of these constituents in the IIE.

Concentrations of all the Part One constituents in intertidal sediments (Table 35.4-6) agree fairly well with available comparison data for Alaskan rock (low and high concentration range) and average continental crust (Saupe et al., 2005), though when compared with the average continental crust, the sediments sampled for Pebble Project appear to be somewhat richer in arsenic—a fairly typical phenomenon in Alaska—and leaner in chromium, and lead.

Four constituents were detected in Pebble intertidal samples at concentrations greater than the most conservative corresponding thresholds of biological response (SQuiRT values)—out of a set of 22 samples, nine were above the SQuiRT value for arsenic, 16 for copper, 14 for nickel, and two for zinc. Thus, a majority of copper and nickel concentrations for Pebble samples were greater than the SQuiRT values. As this area has not been intensively developed historically, this observation must reflect the underlying mineralogy of the sediment-producing material in the area.

Concentrations of the 15 Part Two constituents for which intertidal sediments were analyzed varied from tens of µg/kg to tens of millions of µg/kg (Table 35.4-7), a range of seven orders of magnitude. High concentrations (consistently exceeding 100,000 µg/kg) were measured for iron, aluminum, and manganese. Some high concentrations also were measured for ammonia (as nitrogen) and total Kjeldahl nitrogen, though the ranges of concentrations for these two constituents were highly variable. Low concentrations (consistently below 500 µg/kg) were measured for thallium, bismuth, and beryllium. Low concentrations of cyanide also were measured in many samples of intertidal sediments; however, the range of concentrations for cyanide was greater than for other constituents.

As with the Part One constituents, the ranges of concentrations for the individual Part Two constituents varied widely. For example, cyanide and ammonia (as nitrogen) each had ranges greater than two orders of magnitude, while aluminum, cobalt, iron, manganese and vanadium each had ranges of less than a factor of three. Tin had a range exceeding an order of magnitude, but its pattern was complicated because more than half of the results were reported below the MDL; detectable concentrations for tin ranged from 360 to 9,200 µg/kg.

When the results for the three constituents for which there are comparison values (aluminum, iron, and manganese) are viewed against those comparison values, the results for intertidal sediments were comparable to the values for Alaskan rock (low range) and were substantially lower than the comparison values for Alaska rock (high range) and average continental crust (Table 35.4-7).

Subtidal Sediments. As with the intertidal sediments, for subtidal sediments, the range of concentrations among all Part One constituents was substantially greater than the range for any particular constituent (Table 35.4-8); however, the ranges for the subtidal sediments were smaller than those for intertidal sediments. While it is difficult to determine clear distinctions based on the available data, it does appear that the concentrations measured for station MOPP1 were near or below the lower range of concentrations for the stations closer to shore. MOPP1 also had the coarsest sediment (i.e., lowest percent fines), which reinforces the pattern.

Agreement between the Pebble Project results for subtidal sediment and the comparison values from literature is moderately good for the Part One constituents (Table 35.4-8). For constituents for which explicit concentrations are available in the Burrell (1978) data set (copper, nickel, and zinc), the concentrations in the Pebble Project study were almost uniformly higher. For the Chinitna Bay and Cook Inlet locations from the AKMAP data set (Saupe et al., 2005), the concentration for one or both of the locations was within the range of concentrations from the Pebble study for arsenic, chromium, copper, lead, mercury, and nickel. For arsenic, chromium, and lead, however, the concentrations from the Pebble study were generally lower than the AKMAP data. For antimony, cadmium, silver, and zinc, the concentrations for both AKMAP locations were greater than the concentrations from the Pebble study, substantially so for antimony, cadmium, and silver. Chromium, copper, and mercury had generally comparable concentrations in both investigations. In no case were the concentrations for the AKMAP data set substantially or even generally less than the Pebble Project concentrations. The provisional conclusion from this evaluation is that data from the available literature for locations closest to the IIE may vary among studies by substantial factors.

Compared to the average continental crust values, subtidal sediments in the IIE appeared to be leaner in antimony, cadmium, chromium, lead, and nickel, but substantially richer in arsenic (Table 35.4-8). However, owing to the particular mineralogy of crustal materials in Alaska, it might be more useful to compare sediment concentrations for the IIE to the ranges for Alaska rock. Chromium and zinc measured in IIE sediments were below the ranges for these constituents in Alaska rock. While the variation between concentrations measured in IIE sediment and those reported for average continental crust and Alaska rock was considerable, the variation between measured concentrations from other sediment studies and the values for average continental crust and Alaska rock also was considerable.

Three constituents—arsenic, copper, and nickel—had some concentrations in IIE subtidal sediments that were higher than the respective SQuiRT concentrations (Table 35.4-8). Each of these constituents had a concentration higher than the SQuiRT value in the same five of eight sampling occasions—MPS4 in 2004 (but not in 2008), MWGI in 2004, MPS1 in 2004 and 2008, and MPS2 in 2004. In addition, for these three constituents plus chromium and zinc, the range of concentrations between MPS4 in 2004 and in 2008 defines the range of concentrations for all of the nearshore stations (i.e., MPS4, MPS1, and MPS2). This range, which represents sampling at the same location over an interval of approximately 4 years, suggests the variability to be expected in a field program.

For Part Two constituents in subtidal sediment samples, thallium and tin had ranges greater than one order of magnitude (Table 35.4-9). Ranges for the other inorganic constituents, except for molybdenum (around a factor of 5) and ammonia as nitrogen, were all within a factor of 3. The pattern of lower concentrations for station MOPP1 than for the nearshore stations was generally seen for the Part Two constituents, though it did not appear to be quite as strong as the similar pattern for the Part One constituents.

Of the comparison values from other studies, the only ones that appear anomalous with the concentrations found in IIE subtidal sediments are those of Burrell (1978) for iron and manganese (Table 35.4-9); however, those values appear to be outside the range of concentrations from the other studies as well, so perhaps they are not applicable for this use. The concentrations for aluminum, iron, and manganese from the Pebble Project study were substantially lower than the AKMAP data (Saupe et al. 2005) for the two closest locations at Chinitna Bay and Cook Inlet. Concentrations of aluminum in Pebble Project sediments were lower than Alaskan rock (low tidal elevation) concentrations, while concentrations of iron and manganese in Pebble Project sediments fell within the range of Alaskan rock concentrations.

Subsurface Sediments. The results for Part One constituents in subsurface sediments are presented in Tables 35.4-6 and 35.4-8. With only a few minor exceptions, the subsurface sediment samples show subtly but consistently lower concentrations of Part One inorganic constituents when compared with surface sediment samples from the same station. This observation applies to both the intertidal and subtidal sediments. The results of a comparison of data from the Pebble Project study with data from the available literature, then, would be similar, with the caveat that the data from literature values are for surface sediments. For copper and nickel, the concentrations in the subsurface sediment samples from intertidal station MPS3 and subtidal station MPS1 were higher than the respective SQuiRT values.

For Part Two constituents, subsurface concentrations ranged from only slightly higher than to consistently lower than those in surface sediments from the same station and elevation (Tables 35.4-7 and 35.4-9); the differences were within the range of expected sample-to-sample variability. Thus, concentrations of inorganic constituents in the subsurface sediments cannot be meaningfully distinguished from those of sediments in the surface layer.

AVS and SEM. Sediment samples collected in 2008 were analyzed for AVS and SEM. The relationship between AVS and SEM is an important indicator of the bioavailability of six inorganic constituents—cadmium, copper, lead, mercury, nickel, and zinc. When AVS is present, the metals are expected to be bound to the sulfide, and that condition decreases their availability to organisms. Because this relationship occurs on a molecular level, the concentrations are expressed on a molar basis—in this case μmol/kg dry weight. The concentrations of the six SEMs can be added together and compared to the AVS concentration to measure bioavailability—if the sum of the SEM concentrations is greater than the AVS concentration, then the metals would be expected to be bioavailable.

In the case of the intertidal sediments, the AVS-SEM comparison shows that only at station MPS3 did the AVS concentration eclipse the summed SEM concentrations; therefore, that is the only intertidal station where the bioavailability of the metals in surface sediment would be diminished (Table 35.4-10). With the exception of station MPS4, the summed SEM concentrations for intertidal sediment showed only minor variation, ranging from 1,026 to 1,788 μmol/kg. On the other hand, the AVS concentrations for the same stations ranged from 53 to 3,711μmol/kg, a much larger range. The diminished bioavailability expected for station MPS3 arises from the higher concentration of AVS rather than from low SEM concentrations—a condition comparable to that in the subsurface sediment environment as measured at intertidal stations MPS3 and MBB and the subtidal station MPS1.

For the subtidal sediment samples, the AVS concentration was substantially less than summed SEM concentrations at all three stations; therefore, the metals would be expected to be bioavailable in those subtidal sediments.

The AVS concentrations in the subsurface stratum were much greater than those observed in the surface layer at the same stations and substantially exceeded the summed SEM concentrations for subsurface sediment at each station. The high AVS relative to SEMs indicates that the bioavailability of the six metals would be greatly diminished in the subsurface stratum.

Inorganics Summary. In summary, the concentrations of inorganic substances in intertidal and subtidal sediment have been documented for multiple stations in the IIE over multiple years. Evaluation of the data indicates a moderate degree of variability in concentrations in subtidal sediment and a greater variability in intertidal sediments. Sediment concentrations in general were comparable to concentrations that might be expected based on values for average continental crust and Alaskan rock. Comparable studies of marine sediments in Cook Inlet show both higher and lower concentrations than those in the IIE. Though investigating the same region, these other studies measured conditions at distances generally greater than 10 nautical miles from the IIE; so, while it is useful to examine relationships between the Pebble Project data and data from other studies, the direct applicability of those other data to the IIE is limited. The variability shown by the results of the study approach described in this report demonstrates the challenge of estimating environmental conditions in the absence of empirical data; with these data, it is possible to conclude that the IIE appears to have general sediment chemistry that is typical of expected sediments in undeveloped bays in lower Cook Inlet. The Pebble Project study has produced sufficient data to provide a baseline of chemical constituents in sediment at specific locations of interest in the IIE.

Organic Compounds

The information for organic compounds in sediments in the IIE is not as complete as for the inorganic constituents. (Analytical results for organic constituents in sediment are provided in Appendix 35.4A2.) BTEX, gasoline-range organics (GRO), DRO, RRO, and the set of 18 PAHs (measured in 2005) were not detected above the MDL in most samples (Tables 35.4-11 and 35.4-12), as described below. Such results do allow the establishment of upper bounds for concentrations of organic compounds in the study area, but limit how precisely the distribution of these constituents can be described. In the 2008 analyses for AHCs and the more refined measurement for PAH compounds, about one-third of the results were below the MDL. This circumstance limits the conclusions that can be drawn regarding the sources of any petroleum hydrocarbons that are present in sediment in the IIE, although a few techniques of source interpretation for petroleum hydrocarbons were applied to the Pebble Project data below. A more general discussion of these techniques can be found in Payne et al. (2006).

The BTEX compounds were not detected in any sample of intertidal or subtidal sediment in either 2004 or 2005 (Tables 35.4-11 and 35.4-12). The absence of these compounds indicates a lack of sources for these compounds in the area.

The GRO, DRO, and RRO were detected sporadically in the intertidal and subtidal sediment samples collected in 2004 (Table 35.4-11) but were not detected in any samples from 2005 (Table 35.4-12). GRO was detected above the MDL in five 2004 samples from intertidal sediment. The range of concentrations for GRO in these samples was 210 to 502 µg/kg. Representative (in most cases, median results for sets of replicate samples) GRO concentrations for subtidal sediments ranged from 258 to 655 µg/kg. DRO was detected above the MDL in three samples of intertidal sediment at concentrations ranging between 27,800 and 43,400 µg/kg. In subtidal sediment, GRO was detected above the MDL at only one station (MPS2) and had a median value of 11,600 µg/kg, considerably lower than the range detected in intertidal sediments. RRO was the most commonly detected (above MDLs) of the three petroleum hydrocarbon groups among all samples, and it was detected in a majority of cases for both intertidal and subtidal sediments. Concentrations of RRO in intertidal sediment samples ranged between 32,200 and 142,000 µg/kg, and in subtidal sediments, representative concentrations ranged between 9,300 and 33,900 µg/kg. The detectable GRO concentrations were about two orders of magnitude less than the detectable DRO concentrations, while the detectable RRO concentrations were substantially greater than the detectable DRO concentrations. These results demonstrate a clear difference between the concentrations of GRO, DRO, and RRO.

For 18 PAH compounds measured in intertidal sediments in 2005, only 27 percent of the results were above the MDLs, and eight of the compounds were not detected above the MDLs in any samples (Table 35.4-12). For the 34 detectable values across ten PAHs, concentrations ranged between 0.29 µg/kg and 3.4 µg/kg. All of the results—both detectable concentrations and the calculated values used to represent non-detect results—were below the respective SQuiRT values, when available (Buchman, 2008).

The most recent analyses for organic compounds in sediments in the IIE were conducted in 2008 and included both aliphatic (AHCs) and aromatic (PAHs) compounds, as well as total petroleum hydrocarbons (TPH). (TPH comprises the sum of the concentrations of AHCs, PAHs, and other organic compounds. The patterns observed in the distribution of the concentrations of AHCs and of PAHs provide keys to the origin of the petroleum hydrocarbons; however, those two compound groups account for a small portion of the TPH concentration. Other organic compounds comprise approximately 80 to 90 percent of the TPH concentration for a given sample.) Concentrations of TPH in intertidal sediments ranged between 1,000 and 28,400 µg/kg (Figure 35.4-9). Median values of TPH concentrations in subtidal sediments ranged between 3,900 and 12,400 µg/kg (Figure 35.4-10). These values are in the range of concentrations reported in Boehm (2001) for subtidal sediments from near Augustine Island (12,000 µg/kg) and by Shaw (1978) for subtidal sediments from Iniskin Bay (7,300 µg/kg).

The carbon preference index (CPI; O'Clair et al., 1995) compares the alkane compounds, which have particular physical characteristics (boiling point range), that distinguish between petroleum hydrocarbons from biogenic sources (terrestrial plants) and those from petrogenic sources (fossils such as oil or coal). The particular alkane compounds within the AHCs are in the range of 26 to 30 carbon atoms in each molecule (designated as n-C26 to n-C30; see Table 35.4-3 for a list of the AHC analytes for the Pebble Project marine sampling and their respective designations). Hydrocarbons from biogenic sources tend to have higher concentrations of molecules that contain an odd number of carbon atoms (referred to as odd-numbered chains), while hydrocarbons from petrogenic sources tend to have an even distribution of odd-numbered and even-numbered chains. CPI values in the range of 2 to 4 indicate terrestrial plant contribution, and CPI values decrease to 1 with the addition of petrogenic sources. With one exception, the CPI values for the 2008 IIE data set for intertidal sediments equal or exceed 3, indicating that biogenic sources are likely. Intertidal sediments from the IIE showed a pattern of the odd-numbered chains (n-C27 and n-C29) predominating in the same molecular-weight range (n-C26 to n-C30; Figure 35.4-11). The exception was for the lower elevation at intertidal station MPS4, which had anomalous (very sandy) physical characteristics. The same information can be seen somewhat more clearly in the profile of AHCs for subtidal sediments presented in Figure 35.4-12; the odd-numbered chains (n-C27, n-C29) again predominated over the even-numbered chains in that molecular-weight range (n-C26 to n-C30). Collectively these results support the conclusion that the hydrocarbons in the IIE sediments are largely biogenic in origin, but do not conclusively rule out other sources.

Results of the analyses for PAHs in intertidal and subtidal sediments are presented in Figures 35.4-13 and 35.4-14, respectively (abbreviations for the PAHs are defined in Table 35.4-3). The patterns of concentrations for the two sediment environments are virtually identical, although only Station MPS4 was sampled at both depths. For each sample, concentrations of perylene exceeded those of other PAHs. The next lower concentrations were for the naphthalenes and phenanthrenes/anthracenes. The major difference between patterns of PAH concentrations in intertidal and subtidal sediments was the relatively higher concentrations of phenanthrenes/anthracenes in intertidal sediments. The next lower concentrations were for chrysenes, then for fluoranthenes/pyrenes and fluorenes. As with the predominance of odd-numbered-chain AHCs over even-numbered-chain AHCs, the higher concentrations of perylene suggest a biogenic origin for the petroleum hydrocarbons in the sediments of the IIE.

Additional insights into sources can be gained from examining the distribution of PAHs, also known as a hydrocarbon "fingerprint" in intertidal (Figure 35.4-13) and subtidal (Figure 35.4-14) sediments. As noted above, the spike in perylene (labeled "Per" on the graphs) indicates a biogenic source (Lees et al. 1999).

Lees et al. (1999, Page 80) also eloquently describe a key way of identifying a petroleum source based on the distribution of PAH compounds:

> Petrogenic PAHs have a characteristic fingerprint where the parent compounds (i.e., C_0-napthalene (N), C_0-fluorene (F), C_0-phenanthrene (P), C_0-dibenzothiophene (D), and C_0-chrysene (C)) are usually at lower concentrations than their alkyl-substituted homologues (i.e., C_1-naphthalenes (N1), C_2-naphthalenes (N2), C_1-fluorenes (F1), etc.). With weathering, this feature becomes more prominent because the more soluble parent compound (C_0) disappears before the alkyl homologue (C_1), which in turn disappears more quickly than C_2, etc. Thus, a characteristic 'water-washed' profile is generated where the $C_0<C_1<C_2<C_3$ within each PAH group in the residual oil phase.

Although this relationship appears to hold for N and N1 at each sampling station in the IIE, for other PAH groups (e.g., fluorenes [F]) this relationship does not hold for all stations and breaks down almost entirely for the more highly substituted homologues (e.g., N1, N2, N3). Three intertidal sampling stations that appear to have a pattern different from the others are MPS3L, MPS2, and MBB (Figure 35.4-13). MPS2 and MBB, located in Iniskin Bay adjacent to Oil Bay, which is an area of known petroleum seeps, might seem to be candidates for a petrogenic source. A close examination of the data for these two stations with a histogram plot of Cook Inlet crude (Page 79 of Lees et al., 1999) does show some agreement between the relative peaks of the PAH compounds, especially for fluorenes. However, for other homologue groups (e.g., phenanthrene/anthracene, fluoranthene/pyrene) the relative concentrations are ranked in different orders. Thus, the weathering influence described by Lees et al. (1999) does not clarify the situation seen in the Pebble data set in a way that supports the possibility of a petrogenic source. Further, the relatively high concentration of perylene in IIE intertidal sediments suggests a biogenic origin rather than a petrogenic source. Perylene is also quite prominent in the subtidal sediments, lending support to the possibility for a biogenic source. The data do not suggest a petrogenic source for the petroleum hydrocarbons in intertidal and subtidal sediments from the IIE.

Total PAH concentrations (excluding perylene because of its biogenic origin) for the intertidal stations in the Pebble Project study ranged between 10 and 203.7 µg/kg. The median total PAH concentrations for subtidal sediments (without perylene) ranged between 71 and 86 µg/kg. Information from the AKMAP project (Saupe et al., 2005) indicates these are typical values for stations around Cook Inlet. One sample of sediments from Augustine Island reported by Boehm (2001) contained 170 µg/kg total PAH. The Cook Inlet Regional Citizens Advisory Council environmental monitoring program reported total PAH concentrations ranging between about 30 and 80 µg/kg for stations in Kamishak Bay (Lees et al., 1999). The total PAH measurements from the Pebble Project study agree with available information, with the exception of the Chinitna Bay sample for the AKMAP project.

The substantial concentrations of PAHs with higher molecular weights (on the right half of Figures 35.4-13 and 35.4-14) appear to be high when compared to their relative concentrations in Cook Inlet crude (Lees et al. 1999). This circumstance may indicate a pyrogenic source (from combustion processes such as fire or motorized vessels) for these higher-molecular-weight PAHs (Lees et al. 1999). In sum the PAH data for the IIE do not fully eliminate any particular source of petroleum hydrocarbons, but do support the conclusion that biogenic and pyrogenic sources are more important than petrogenic sources. This interpretation must be viewed in the context of generally low concentrations of all petroleum hydrocarbons in IIE sediments, meaning the signal-to-noise ratio is low for instrumental detection as well as for the “fingerprint” picture that the analytical results describe.

35.4.7.2 Biological Tissue

Rockweed

Rockweed (*Fucus distichus* ssp. *evanescens*) tissues were collected for analysis of inorganic constituents in May, July, and September 2008. The results of the chemical analyses for rockweed are provided in Table 35.4-13. (The results for three constituents for which samples were analyzed are not presented in Table 35.4-13: selenium and tin were not detected above the MDL in any sample, and beryllium was detected only in the September sample from station MPS4 at 6 µg/kg. Analytical results for inorganic constituents in plant tissue are available in full in Appendix 35.4B.)

No clear temporal or spatial pattern was observed in the results. The data are useful in characterizing the overall concentration of the measured analytes through median values (which are presented in the second row from the bottom of Table 35.4-13). Median concentrations ranged from 10 µg/kg for thallium to 115,500 µg/kg for boron. Higher concentrations were reported for boron, arsenic, and zinc, while lower concentrations were reported for thallium, mercury, and antimony. To serve as a check on the data obtained in the Pebble Project investigation, background values were compiled from a U.S. Geological Survey (USGS) database (Eisler, n.d.) and presented in the last row of the table. Information was available for *Fucus distichus* for three analytes (arsenic, lead, and zinc) and for *F. vesiculosus* (an Atlantic rockweed species) for another three (cadmium, chromium, and nickel). In this compilation the data for the genus and analytes of interest represent tissue samples from disparate locations (northern Europe and Greenland, where known). In some cases the samples came from waters affected by metal deposits or mine wastes at the time of sampling, and thus do not represent natural background conditions. While not ideal, these data can be used for a rough comparison with the results obtained in the Pebble Project study. The USGS concentration selected for inclusion in Table 35.4-13 was the mid-range of the concentrations considered best representative of rockweed in natural waters, albeit possibly affected by human activities. The median values from the Pebble investigation are all within an order of magnitude of the respective representative values from the USGS database, which is considered acceptable agreement given the disparate locations and species represented in the two data sets. The median arsenic value in the IIE data was substantially (3 times) higher than the USGS value, consistent with the known natural elevation of arsenic concentrations in Alaska and with the relatively high levels of arsenic reported above in IIE sediments. The median concentrations for all other inorganic constituents in rockweed from the IIE were lower than the corresponding values from the USGS database.

Inorganic Constituents in Fish and Invertebrate Tissue

Overall, inorganic constituents in animal tissue were detected at frequencies that allow a reasonable description of their distribution. Also, the values used to represent non-detect results were generally below the lowest detected concentrations for each respective analyte, which pattern also provides confidence in describing constituent distribution.

The data for inorganic constituents in fish and invertebrate tissue are presented in two parts: Table 35.4-14 presents the results of the sampling in 2004 and 2005; Table 35.4-15 presents the results of the 2008 sampling. The two tables reflect the two types of sampling employed—opportunistic sampling of a wide variety of taxa in the 2004 and 2005, and multiple sampling of more targeted fauna in 2008. (Analytical results for inorganic constituents in fish and invertebrate tissue are available in full in Appendix 35.4C1. In the appendix, sampled species are identified by their scientific name. Table 35.4-5 lists both the common and scientific names of the species sampled.)

In 2004 and 2005, inorganic constituents were found at a wide range of concentrations in invertebrates (Table 35.4-14). This is true across constituents, as well as within constituents and across species. Some of the highest concentrations were measured in the Oregon triton (*Fusitriton oregonensis*). These high concentrations may reflect this species' niche as a predator and carnivore, which puts it in a position to biomagnify concentrations. The Oregon triton's inherent molluscan physiology may contribute to the observed high concentrations, as well. Other high concentrations—but generally not quite as high as for Oregon triton—are reported for individual constituents in other invertebrate species from a variety of niches, e.g., scavengers as represented by crabs and filter feeders as represented by clams. The key observation is that the Oregon triton is a predator, and it had by far the highest concentrations of toxicologically important inorganic constituents (specifically arsenic, cadmium, and mercury). It also had high concentrations of copper and lead, as well, but not nickel. The lyre whelk is another predatory snail taken from the same location as the Oregon triton sample (MPS11dx). The whelk showed a pattern of inorganic constituents similar to that of the Oregon triton; however, the concentrations were much lower in the whelk, often by an order of magnitude (Table 35.4-14). These patterns show some evidence for the widely accepted concept that predators tend to biomagnify concentrations, but they do not conclusively prove that premise. The data from the study by Burrell (1978) bracket well the concentrations of copper and nickel measured in the Pebble Project study; however, the concentrations of cadmium in Burrell's study were, inexplicably, substantially lower.

For fish species, the variations in inorganic constituents appeared to be not as wide as for the invertebrates; however, except for mercury and nickel, concentrations of constituents in the liver sample from a chum salmon measured higher—substantially higher for some constituents—than concentrations in muscle tissue from this species. These results would be expected, given the potential for accumulation in the liver, compared with muscle tissue. Further generalizations about the data are difficult to make because generally patterns hold for some species and constituent combinations, but not others. Zinc concentrations appeared to be relatively consistent (within a factor of three) across all the samples. On the other hand arsenic varied across the four samples of starry flounder (*Platichthys stellata*) by a factor of five, as did copper for that species; the variation in lead concentrations for starry flounder was several orders of magnitude. In this situation with all samples of a given species collected from the same bay, it is difficult to ascribe the variations in concentrations to any factor other than inherent individual differences.

Median concentrations for inorganic constituents in fish and mussel samples collected in 2008 are presented in Table 35.4-15. The highest median concentrations were for zinc. The lower concentrations were generally for antimony, beryllium, silver, and thallium. Concentrations of other inorganic constituents also varied by species.

Agreement of IIE values for 2008 with those from literature was generally good (Table 35.4-15). Notable differences for mussels included chromium, nickel, and copper, which were higher for the Pebble Project study than in data from available literature. Other values for mussels either overlapped or were close to those from the IIE.

For fish species, the agreement between IIE data and those from the literature ranged from exceedingly good for arsenic and cadmium, to weaker agreement for other constituents. For example, the median lead concentration in yellow sole (*Limanda aspera*) for the Pebble Project study (130 µg/kg) differed from the range of lead concentrations for flathead sole (*Hippoglossoides elasodon*) in the Burrell (1978) investigation (920 to 1,160 µg/kg) by almost an order of magnitude. These are different species, however, and the difference in species life histories may introduce some variation into the comparison. The concentrations of inorganic constituents for the Pebble study agree relatively well with data for the same species from the ADEC FMP. Values for mercury in Pacific halibut (*Hippoglossus stenolepis*) and selenium in all three species did not agree as closely as other comparative values, but in general the data are mutually reinforcing. Detection limits in the Pebble study appear to be lower than those for the FMP data (indicated by the “less than” symbol [<] in Table 35.4-15), so more detectable concentrations were reported for Pebble Project than for the FMP.

One striking observation evident in Table 35.4-15 is for cadmium; the concentrations fall into three ranges. For the three adult salmonids (pink salmon, chum salmon, and Dolly Varden) and for Pacific halibut, the median concentrations were all less than 10 µg/kg. For juvenile Dolly Varden, starry flounder, and yellow sole, the median concentrations were between 10 and 100 µg/kg. For mussels, they were greater than 2,000 µg/kg. While it might be possible to challenge these differences as resulting from sample type—muscle tissue for adult salmonids and halibut compared to whole-body residues for mussels—starry flounder and yellowfin sole samples were prepared for analyses as whole-body residue. Furthermore, the cockles and clams analyzed in 2004 (Table 35.4-14), which are close taxonomically to mussels and occupy similar ecological niches as filter feeders, had substantially lower concentrations of cadmium than the mussels analyzed in 2008. Horse mussels (*Modiolus modiolus*), a species closer to mussels taxonomically than are cockles and clams and also closer behaviorally and physiologically, had a concentration of cadmium in the high range of that of mussels analyzed in 2008. This pattern of cadmium concentration is corroborated by the values available from the literature.

On the other hand, the concentrations of cadmium in the habitat of these organisms—intertidal sediment, subtidal sediment, and water (marine water quality is described in Chapter 34)—is quite constant. Cadmium was one of the constituents with the least variation—less than a factor of three in water (Chapter 34) and subtidal sediments (Table 35.4-8) and just over a factor of three in the physically heterogeneous environment of intertidal sediments (Table 35.4-6). Thus it is clear that different organisms handle cadmium in different ways. Given the niche of mussels as filter feeders, it would appear that the high concentrations in their tissues arise from bioconcentration of cadmium directly from water, a phenomenon not shared by other filter feeders, i.e., clams and cockles—that had lower values for cadmium. The demersal fish starry flounder and yellowfin sole may bioaccumulate cadmium in the course of their feeding activities associated with the sea bottom; this exposure could occur by direct ingestion of sediment in the course of feeding or from higher concentrations in their prey organisms, compared to prey of fish feeding in the water column. However, bioaccumulation apparently does not cause high concentrations of cadmium in top predators (e.g., salmonids).

Similar patterns of distribution among species were observed for boron and to a lesser extent for beryllium, chromium, lead, molybdenum, and thallium in the 2008 samples (Table 35.4-15). One constituent that ran noticeably counter to this pattern was mercury. Median concentrations for mercury were highest in Pacific halibut, while mussels had relatively low concentrations. The data from the Pebble Project study are too limited to establish this observation as a certain case; however, the values from literature do support a pattern of elevated mercury in longer lived carnivorous fish such as halibut.

Some of the trace elements for which tissue samples were analyzed (e.g., cadmium, lead, mercury) have no known natural biological role. Others such as copper and zinc are micronutrients, although they are potentially toxic at high concentrations. Invertebrates also use copper in hemocyanin, a pigment necessary in transporting oxygen to tissues, and zinc in metallothionein, an enzyme that among other functions can control the concentration of heavy metals in organisms (Eisler, 1993, 1998). As a result, concentrations of these trace elements are generally well regulated within organisms even when ambient concentrations vary widely. The trace elements with no known biological role (e.g., cadmium, lead, mercury) are typically those considered more toxic to aquatic organisms since the organisms do not regulate these elements as well, and the potential for bioaccumulation is therefore greater.

While the above discussion separated the data based on sampling objectives, some observations may be made looking at the entire data set. Across all fish and invertebrate species, sampling events, and inorganic constituents the range of concentrations was over five orders of magnitude. Zinc, copper, and arsenic had the highest concentrations, and the lowest concentrations were measured for antimony, beryllium, and thallium. Some inorganic constituents had relatively even concentrations across the species sampled. This pattern was true both for constituents with low concentrations (e.g., antimony) and those with high concentrations (e.g., zinc). Other constituents were highly variable across the species sampled (e.g., copper). While some constituents were not detected above the MDL in some species, the relatively low values for the MDLs in combination with the relatively low detected concentrations give confidence in this baseline of inorganic constituents in the IIE.

Additional Analyses for Mussels in 2008

Results of the analyses performed only on mussel tissues and only in 2008 are summarized in Table 35.4-16 (full laboratory data are presented in Appendix 35.4C2). These data include results for total lipids, AHCs, and PAHs. Lipid concentrations ranged between 1.0 and 9.1 percent. Assessment of the seasonal data showed that the July (midsummer) samples had generally higher concentrations of lipids than did the spring or late summer samples.

Concentrations of total AHCs in mussels ranged between 7,479 and 27,943 µg/kg, and concentrations of total PAHs (without perylene) ranged between 43 and 233 µg/kg (Table 35.4-16). Total AHC concentrations were lowest in May, but total PAH concentrations were highest then.

Payne et al. (2006) performed a time-series analysis on tissue samples from mussels (*Mytilus* sp.) collected from Shuyak Harbor (on Kodiak Island) and Windy Bay (on the southwest Kenai Peninsula), among other areas. These locations are in areas with minimum effects from human activities; however, the time series was performed for areas selected to study the long-term effects of the *Exxon Valdez* oil spill. Still, these locations were considered remote and clean and may be indicative of background conditions relatively close to the IIE. Concentrations of total PAHs in samples collected in 2003 through 2005 from Shuyak Harbor were less than 40 µg/kg dry weight, and concentrations for samples from Windy Bay were less than 60 µg/kg dry weight. The concentrations for both of these locations had been declining over periods from a few years to a decade or more, thus they may represent a return to concentrations reflective of unaffected conditions. Concentrations of total AHCs were 1,300 µg/kg for a 2004 sample from Shuyak Harbor and 2,800 µg/kg for a 2005 sample from Windy Bay. The concentrations for total PAHs and total AHCs for the IIE were substantially higher than these values. It would be difficult to assign the enrichment of AHC and PAH in mussel tissue to any particular origin. As with the results for sediment, concentrations of constituents in mussel tissues were generally low, limiting the ability to identify sources definitively.

35.4.8 Summary

Concentrations of inorganic substances and organic compounds important to the marine habitat in Iliamna and Iniskin Bays were measured in sediments and selected biotic tissues. Sediments were analyzed for grain size, total organic carbon, inorganic constituents, ammonia (as nitrogen), total Kjeldahl nitrogen, acid-volatile sulfide and simultaneously extractable metals, and a variety of organic compounds.

As would be expected, intertidal sediments showed a wide range of grain size and TOC content. Subtidal sediments showed substantial variation in these two properties, but over a smaller range than in intertidal sediments. Overall, inorganic constituents were detected at sufficient frequency to give confidence in understanding their distribution in the IIE. Concentrations of the inorganic constituents measured in sediments spanned a range of seven orders of magnitude. Higher concentrations were reported for iron, aluminum, and manganese. Lower concentrations were reported for antimony, bismuth, cadmium, mercury, silver, and thallium. The six simultaneously extractable metals were bioavailable, at least in part, at all but one of the surface sediment stations. BTEX was not detected in sediments. AHCs and PAHs were detected across a range of frequencies from rarely to consistently, but concentrations were low and gave no indication of recent or ongoing inputs.

Taking the broad views of media and analytes, the inorganic substances in sediment samples from the IIE do not show evidence of substantial human activity. However, sediments showed concentrations greater than threshold values of biological response (Buchman 2008) for three substances: arsenic, copper, and nickel. The origins of the low concentrations of petroleum hydrocarbons measured in sediments cannot be ascribed to a single source. Petroleum hydrocarbons likely arise from all three sources—petrogenic (from fossil hydrocarbons like oil or coal), biogenic (from recent biological sources), and pyrogenic (combustion products), with more direct support for biogenic and pyrogenic origins. The relatively low concentrations observed in the IIE are comparable to those reported from other remote areas in Cook Inlet and make ascribing sources difficult. As with sediments, examination of organic compounds in mussels indicates a mixed origin for the petroleum hydrocarbons observed with no support for any particular source.

Rockweed (*Fucus distichus* ssp. *evanescens*) tissues were collected for analysis of inorganic constituents in 2008. Thirteen inorganic constituents were detected consistently in rockweed samples collected during the 2008 sampling period and throughout the IIE (Table 35.4-13). Median concentrations in rockweed ranged from 10 µg/kg for thallium to 116,000 µg/kg for boron. Higher concentrations were reported for boron, arsenic, and zinc, while lower concentrations were reported for thallium, mercury, and antimony.

Invertebrate and fish samples were analyzed for 16 inorganic constituents. Collection of biotic tissues for chemical analysis during the 2004 and 2005 field seasons was based largely on opportunistic sampling of species. Invertebrates predominated in 2004, and supplemental collection of fish species was performed in 2005. In 2008, selected species were targeted for replicate sampling. Across all algal, invertebrate and fish species, sampling events, and inorganic constituents, the range of concentrations was over five orders of magnitude. Zinc, copper, and arsenic had the highest concentrations measured in invertebrate and fish samples, and the lowest concentrations were measured for antimony, beryllium, and thallium. Some inorganic constituents had relatively even concentrations across the species sampled. This pattern was true both for constituents with low concentrations (e.g., antimony) and those with high concentrations (e.g., zinc). Other constituents (e.g., copper) were highly variable across the species sampled. While some constituents were not detected above the MDL in some species, the relatively low values for the MDLs in combination with the relatively low detected concentrations give confidence in this baseline of inorganic constituents in the IIE.

For concentrations of inorganic substances in biotic tissues, comparable data are quite scant, so regionally expected values are generally not available. Regional tissue concentrations are even less available than data for other media like sediments or water (Chapter 34). Concentrations of PAHs in mussel samples from the IIE were higher than those reported for mussels from nearby locations in southcentral Alaska, but there is no evidence to suggest local or recent sources of the PAH concentrations in mussels from the IIE. The value of the data gathered in the Pebble Project study is that they provide empirical measures of existing conditions in the IIE; there is relatively good internal agreement over media, species, and time; and they document relatively uncontaminated conditions in the IIE.

35.4.9 References

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35.4.10 Glossary

Benthic—of or related to the bottom of a body of water.

Biomass—amount of living matter, usually in one organism, sometimes in a collection of organisms, that comprises a population.

Biota—the organisms of a region, excluding humans.

Demersal fish—fish that feed on the bottom of the ocean or other bodies of water.

Homologue—a series of compounds in which each member differs from the next member by a constant amount is called a homologous series; members of this series are called homologues.

Macroalga—large, multicellular, nonvascular marine plants (commonly called seaweed).

Micromole—one millionth of a mole, with a mole being the amount, in grams, of a substance equal to the molecular weight of the substance.

Nautical mile—a unit of distance equal to 1.852 kilometers or 6,076 feet, which is approximately 1.15 statute miles.

Replicate sample—one of a series of samples collected at a single sampling station using the same collection technique repeatedly; each replicate sample receives a unique sample identification and is analyzed as a separate sample.

Sessile—anchored to rock or other substrate.

Threshold level (or value) of biological response—concentration of a constituent above which a biological response may be observed in a sensitive organism.

Trophic relationships—associations between or among organisms based on feeding patterns.

TABLES

TABLE 35.1-1
Plant Species Sampled, Cook Inlet Drainages Study Area, 2004 through 2007

Common Name	Scientific Name	Number of Samples
VEGETATIVE TISSUE		
Trees		
Mountain alder	*Alnus crispa*	19
TOTAL TREES		**19**
Shrubs		
Bog blueberry	*Vaccinium uliginosum*	5
Crowberry	*Empetrum nigrum*	11
Devil's club	*Oplopanax horridus*	3
Dwarf dogwood	*Cornus canadensis*	2
Lingonberry (low bush cranberry)	*Vaccinium vitis-idaea*	6
Marsh Labrador tea	*Ledum decumbens*	2
Narrow leaf Labrador tea	*Ledum palustre*	4
Red elderberry	*Sambucus racemosa*	3
Salmonberry	*Rubus spectabilis*	7
Willow (not keyed to species)	*Salix sp.*	3
TOTAL SHRUBS		**46**
Forbs		
Alaska spirea	*Spiraea stevenii*	1
Fireweed	*Chamerion angustifolium*	1
Lady fern	*Athyrium filix-femina*	6
Meadow horsetail	*Equisitum pratense*	2
Wild celery	*Angelica genuflexa*	3
Wormwood	*Artemisia tilesii*	2
TOTAL FORBS		**15**
Grasses and Sedges		
American dunegrass	*Leymus mollis*	1
Blue joint grass	*Calamagrostis sp.*	7
Northern water sedge	*Carex aquatilis*	4
Sand ryegrass	*Leymus arenarius*	2
TOTAL GRASSES AND SEDGES		**14**
Mosses		
Club moss	*Lycopodium annotinum*	
Green terrestrial moss	*Ptilium crista-castrensis*	12
TOTAL MOSSES		**12**
Lichens		
Curled snow lichen	*Flavocetraria cucullata*	3
Reindeer lichen (caribou moss)	*Cladina rangiferina*	2
TOTAL LICHENS		**5**
FRUIT TISSUE (Berries)		
Bog blueberry berries	*Vaccinium uliginosum*	1
Crowberry berries	*Empetrum nigrum*	8
Devil's club berries	*Oplopanax horridus*	1
Dwarf dogwood berries	*Cornus canadensis*	2
Lingonberry berries	*Vaccinium vitis-idaea*	6
Salmonberry berries	*Rubus spectabilis*	1
TOTAL FRUIT TISSUE		**18**

Note: the only habitat type from which samples were collected was coastal spruce-hemlock forest.

TABLE 35.1-2
Soil Data Summary and Descriptive Statistics, 2004 and 2006

Analyte	Frequency of Detection [a]	Percent Detected	Range of Detects (mg/kg) (Min - Max)	Range of Method Detection Limits (mg/kg) (Min - Max)	Range of Method Reporting Limits (mg/kg) (Min - Max)	Mean [b] (mg/kg)	Median [b] (mg/kg)	Standard Deviation [b]	Coefficient of Variation
Organic Compounds [c]									
Diesel-range Organics	1 / 1	100%	103 - 103	6.11 - 6.11	61.1 - 61.1	NA	NA	NA	NA
Residual-range Organics	1 / 1	100%	1270 - 1270	6.11 - 6.11	61.1 - 61.1	NA	NA	NA	NA
Trace Elements [c]									
Aluminum	11 / 11	100%	1440 - 250000	1.77 - 85.1	5.70 - 274	30974	8960	73052	2.36
Antimony	6 / 11	55%	0.066 - 0.15	0.036 - 0.094	0.12 - 0.31	0.074	0.066	0.040	0.55
Arsenic	8 / 11	73%	1.89 - 12.3	0.41 - 1.74	1.32 - 5.48	3.96	3.32	3.60	0.91
Barium	11 / 11	100%	10.5 - 221	0.11 - 0.29	0.35 - 0.91	56.9	21.8	71.6	1.26
Beryllium	5 / 11	45%	0.066 - 0.27	0.036 - 0.094	0.12 - 0.31	0.084	0.046	0.072	0.86
Bismuth	1 / 11	9%	0.28 - 0.28	0.072 - 0.19	0.23 - 0.61	0.12	0.090	0.080	0.70
Boron	7 / 11	64%	0.90 - 7.02	0.41 - 9.44	1.32 - 30.5	3.03	2.52	2.03	0.67
Cadmium	4 / 11	36%	0.25 - 0.45	0.072 - 0.19	0.23 - 0.61	0.17	0.090	0.14	0.86
Calcium	11 / 11	100%	776 - 10300	10.9 - 28.6	34.9 - 91.4	3806	2420	3168	0.83
Chromium	11 / 11	100%	1.21 - 71.0	0.14 - 0.37	0.47 - 1.22	10.1	3.43	20.3	2.02
Cobalt	11 / 11	100%	0.67 - 19.5	0.17 - 0.46	0.58 - 1.52	5.00	2.35	5.73	1.15
Copper	11 / 11	100%	5.07 - 202	0.21 - 0.55	0.70 - 1.83	47.8	10.2	59.9	1.25
Iron	11 / 11	100%	1560 - 24000	5.33 - 425	17.2 - 1370	9913	7260	7601	0.77
Lead	11 / 11	100%	1.39 - 7.37	0.072 - 0.19	0.23 - 0.61	2.90	2.31	1.86	0.64
Magnesium	11 / 11	100%	325 - 12900	10.9 - 248	34.9 - 791	3563	1020	4051	1.14
Manganese	11 / 11	100%	12.1 - 669	0.072 - 1.63	0.23 - 5.27	177	47.9	222	1.25
Mercury	11 / 11	100%	0.019 - 0.11	0.014 - 0.037	0.047 - 0.12	0.065	0.054	0.032	0.49
Molybdenum	3 / 11	27%	0.83 - 2.28	0.36 - 0.94	1.16 - 3.05	0.66	0.45	0.62	0.93
Nickel	10 / 11	91%	1.55 - 32.8	0.072 - 0.19	0.23 - 0.61	5.97	2.84	9.13	1.53
Potassium	11 / 11	100%	203 - 2800	36.1 - 94.4	116 - 305	854	387	971	1.14
Selenium	10 / 11	91%	0.45 - 11.5	0.17 - 0.46	0.58 - 1.52	4.17	3.07	4.04	0.97
Silver	1 / 11	9%	1.03 - 1.03	0.036 - 0.094	0.12 - 0.31	0.13	0.045	0.30	2.30
Thallium	8 / 11	73%	0.011 - 0.15	0.0072 - 0.019	0.023 - 0.061	0.057	0.029	0.056	0.97
Tin	1 / 11	9%	3.54 - 3.54	0.36 - 0.94	1.16 - 3.05	1.32	1.27	0.82	0.62
Vanadium	11 / 11	100%	5.01 - 113	1.09 - 2.86	3.49 - 9.14	37.2	19.6	36.8	0.99
Zinc	11 / 11	100%	5.92 - 106	0.36 - 0.94	1.16 - 3.05	34.6	16.7	36.2	1.05

Analyte	Frequency of Detection [a]	Percent Detected	Range of Detects (mg/kg) (Min - Max)	Range of Method Detection Limits (mg/kg) (Min - Max)	Range of Method Reporting Limits (mg/kg) (Min - Max)	Mean [b] (mg/kg)	Median [b] (mg/kg)	Standard Deviation [b]	Coefficient of Variation
Anions and Cations [c]									
Ammonia (as nitrogen)	11 / 11	100%	106 - 696	3.70 - 27.6	11.7 - 87.6	311	299	173	0.55
Chloride	7 / 11	64%	0.60 - 17.6	0.37 - 0.97	1.18 - 3.12	4.04	1.89	5.31	1.31
Cyanide	9 / 11	82%	0.047 - 0.71	0.027 - 0.30	0.053 - 0.59	0.15	0.083	0.20	1.33
Fluoride	1 / 10	10%	1.19 - 1.19	0.37 - 0.97	1.18 - 3.12	0.43	0.43	0.29	0.68
Sodium	11 / 11	100%	279 - 851	36.1 - 94.4	116 - 305	421	365	176	0.42
Sulfate	11 / 11	100%	1.06 - 10.1	0.37 - 0.97	1.18 - 3.12	5.14	4.21	3.05	0.59
Chemical Properties [c]									
Total Organic Carbon [d]	11 / 11	100%	2.2% - 30.9%	0.10% - 0.64%	0.27% - 1.3%	15%	14%	10%	0.65

Notes:

a. Number of detected samples / total number of samples in data set.

b. When calculating the mean, median, and standard deviation, non-detect results were included as one-half the method detection limit. Non-detect results assigned a "U" or "UJ" qualifier were included as one-half the method reporting limit.

c. All data presented on a dry weight basis.

d. Values reported for total organic carbon are expressed as percentages, rather than in mg/kg.

max = maximum.

mg/kg = milligram per kilogram.

min = minimum.

NA = Not applicable; only one sample analyzed.

TABLE 35.1-3

Fruit Tissue Data Summary and Descriptive Statistics, 2004 through 2007

Analyte	Frequency of Detection [a]	Percent Detected	Range of Detects (mg/kg) (Min - Max)	Range of Method Detection Limits (mg/kg) (Min - Max)	Range of Method Reporting Limits (mg/kg) (Min - Max)	Mean [b] (mg/kg)	Median [b] (mg/kg)	Standard Deviation [b]	Coefficient of Variation
Trace Elements [c]									
Aluminum	19 / 19	100%	2.50 - 63.6	0.50 - 4.00	1.90 - 5.00	16.8	13.3	15.4	0.91
Antimony	14 / 19	74%	0.040 - 0.48	0.020 - 0.040	0.050 - 0.10	0.12	0.050	0.15	1.21
Arsenic	1 / 19	5%	0.050 - 0.050	0.050 - 0.060	0.48 - 0.56	0.027	0.025	0.15	5.48
Barium	19 / 19	100%	0.90 - 7.10	0.020 - 0.10	0.050 - 0.50	4.13	3.86	1.83	0.44
Beryllium	0 / 19	0%	NA - NA	0.0030 - 0.020	0.019 - 0.023	NA	NA	NA	NA
Bismuth	6 / 19	32%	0.0060 - 0.031	0.0030 - 0.0080	0.049 - 0.10	0.0063	0.0035	0.0077	1.24
Boron	19 / 19	100%	2.30 - 20.3	0.10 - 3.10	4.90 - 20.5	8.05	8.10	4.01	0.50
Cadmium	4 / 19	21%	0.0050 - 0.062	0.0040 - 0.020	0.048 - 0.056	0.0097	0.0070	0.013	1.35
Calcium	19 / 19	100%	499 - 4920	1.50 - 2.10	4.90 - 10.4	1244	793	1317	1.06
Chromium	7 / 19	37%	0.30 - 1.00	0.20 - 1.00	1.00 - 2.10	0.49	0.50	0.17	0.34
Cobalt	19 / 19	100%	0.0080 - 0.093	0.0030 - 0.010	0.019 - 0.021	0.025	0.015	0.022	0.86
Copper	19 / 19	100%	1.71 - 7.76	0.020 - 0.10	0.10 - 0.11	3.65	3.65	1.50	0.41
Iron	19 / 19	100%	7.80 - 249	0.30 - 0.60	1.90 - 4.20	44.0	15.9	59.3	1.35
Lead	14 / 19	74%	0.020 - 1.49	0.020 - 0.020	0.050 - 0.060	0.24	0.050	0.45	1.86
Magnesium	19 / 19	100%	321 - 1830	0.20 - 1.00	1.90 - 4.20	656	425	504	0.77
Manganese	19 / 19	100%	4.56 - 208	0.020 - 0.070	0.49 - 2.07	69.3	31.3	65.0	0.94
Mercury	15 / 19	79%	0.0050 - 0.017	0.0010 - 0.022	0.015 - 0.044	0.011	0.011	0.0050	0.45
Molybdenum	9 / 19	47%	0.070 - 0.21	0.010 - 0.020	0.050 - 0.060	0.075	0.030	0.062	0.82
Nickel	19 / 19	100%	0.33 - 67.3	0.030 - 0.090	0.19 - 0.23	8.74	0.96	16.7	1.92
Potassium	19 / 19	100%	4000 - 17900	2.40 - 207	194 - 415	8124	7360	3558	0.44
Selenium	0 / 19	0%	NA - NA	0.10 - 0.20	1.00 - 1.10	NA	NA	NA	NA
Silver	3 / 19	16%	0.0060 - 0.0090	0.0030 - 0.0080	0.019 - 0.040	0.0037	0.0030	0.0019	0.50
Thallium	2 / 19	11%	0.0020 - 0.0040	0.0020 - 0.020	0.020 - 0.023	0.0052	0.0040	0.0043	0.83
Tin	4 / 19	21%	4.90 - 6.70	1.00 - 5.20	4.90 - 20.5	5.54	4.90	3.39	0.61
Vanadium	12 / 19	63%	0.020 - 0.18	0.020 - 0.040	0.19 - 0.23	0.072	0.10	0.057	0.79
Zinc	19 / 19	100%	3.95 - 19.3	0.10 - 0.70	0.50 - 2.10	8.29	5.80	5.09	0.61

Analyte	Frequency of Detection [a]	Percent Detected	Range of Detects (mg/kg) (Min - Max)	Range of Method Detection Limits (mg/kg) (Min - Max)	Range of Method Reporting Limits (mg/kg) (Min - Max)	Mean [b] (mg/kg)	Median [b] (mg/kg)	Standard Deviation [b]	Coefficient of Variation
Anions and Cations [c]									
Ammonia (as nitrogen) [d]	3 / 5	60%	32.0 - 117	7.50 - 7.50	13.0 - 13.0	53.0	39.0	36.1	0.68
Chloride [d]	3 / 5	60%	26.0 - 3830	15.0 - 130	100 - 860	986	183	1612	1.64
Cyanide	6 / 19	32%	0.40 - 1.80	0.16 - 0.72	0.80 - 2.40	0.49	0.31	0.45	0.92
Fluoride [d]	3 / 5	60%	2.10 - 2.10	1.40 - 12.0	10.0 - 86.0	2.04	0.70	2.30	1.13
Sodium	15 / 19	79%	81.0 - 1020	1.50 - 21.0	9.70 - 42.0	266	192	245	0.92
Sulfate [d]	3 / 5	60%	879 - 5330	45.0 - 450	100 - 1000	2709	3190	2140	0.79

Notes:

a. Number of detected samples / total number of samples in data set.

b. When calculating the mean, median, and standard deviation, non-detect results were included as one-half the method detection limit.
Non-detect results assigned a "U" or "UJ" qualifier were included as one-half the method reporting limit.

c. All data presented on a dry weight basis.

d. Analyses for ammonia (as nitrogen), chloride, fluoride, and sulfate were done only on samples collected in 2004.

TABLE 35.1-4

Forb Vegetative Tissue Data Summary and Descriptive Statistics, 2004 through 2007

Analyte	Frequency of Detection [a]	Percent Detected	Range of Detects (mg/kg) (Min - Max)	Range of Method Detection Limits (mg/kg) (Min - Max)	Range of Method Reporting Limits (mg/kg) (Min - Max)	Mean [b] (mg/kg)	Median [b] (mg/kg)	Standard Deviation [b]	Coefficient of Variation
Trace Elements [c]									
Aluminum	15 / 15	100%	8.30 - 210	0.50 - 5.10	1.90 - 20.0	96.5	68.2	74.8	0.78
Antimony	8 / 15	53%	0.030 - 0.050	0.020 - 0.040	0.050 - 0.050	0.028	0.030	0.014	0.49
Arsenic	7 / 15	47%	0.050 - 0.36	0.050 - 0.060	0.48 - 0.51	0.078	0.030	0.091	1.17
Barium	15 / 15	100%	1.20 - 262	0.030 - 0.10	0.050 - 0.50	44.1	23.3	64.9	1.47
Beryllium	5 / 15	33%	0.0040 - 0.010	0.0030 - 0.020	0.019 - 0.020	0.0061	0.0070	0.0033	0.54
Bismuth	0 / 15	0%	NA - NA	0.0030 - 0.0070	0.049 - 0.10	NA	NA	NA	NA
Boron	15 / 15	100%	13.0 - 51.1	0.10 - 3.00	4.90 - 20.3	26.7	23.4	11.3	0.42
Cadmium	14 / 15	93%	0.014 - 2.15	0.0060 - 0.020	0.048 - 0.051	0.32	0.051	0.63	1.95
Calcium	15 / 15	100%	3480 - 22300	1.50 - 14.9	5.00 - 49.5	10631	7710	6270	0.59
Chromium	2 / 15	13%	1.00 - 3.00	0.20 - 1.00	1.00 - 2.00	0.59	0.35	0.70	1.19
Cobalt	15 / 15	100%	0.032 - 1.42	0.0030 - 0.010	0.019 - 0.020	0.30	0.17	0.37	1.22
Copper	15 / 15	100%	4.47 - 18.3	0.020 - 0.10	0.10 - 0.10	7.80	6.25	3.81	0.49
Iron	15 / 15	100%	34.5 - 126	0.30 - 0.60	2.00 - 4.10	64.4	58.0	23.3	0.36
Lead	15 / 15	100%	0.030 - 0.73	0.020 - 0.020	0.050 - 0.050	0.17	0.11	0.18	1.07
Magnesium	15 / 15	100%	2360 - 7450	0.20 - 1.00	2.00 - 4.10	4313	3390	1587	0.37
Manganese	15 / 15	100%	57.2 - 917	0.020 - 0.070	0.49 - 2.02	306	175	268	0.87
Mercury	15 / 15	100%	0.012 - 0.098	0.0020 - 0.010	0.018 - 0.020	0.045	0.040	0.024	0.54
Molybdenum	15 / 15	100%	0.020 - 2.06	0.010 - 0.020	0.050 - 0.050	0.51	0.32	0.59	1.15
Nickel	15 / 15	100%	0.38 - 6.66	0.030 - 0.090	0.19 - 0.20	2.69	2.39	1.69	0.63
Potassium	15 / 15	100%	9230 - 32000	2.50 - 203	198 - 1980	20395	19500	6872	0.34
Selenium	6 / 15	40%	0.30 - 0.90	0.10 - 0.20	1.00 - 1.00	0.25	0.10	0.25	1.01
Silver	3 / 15	20%	0.0070 - 0.027	0.0030 - 0.0080	0.020 - 0.020	0.0057	0.0040	0.0064	1.13
Thallium	8 / 15	53%	0.0030 - 0.10	0.0020 - 0.020	0.020 - 0.020	0.023	0.010	0.030	1.34
Tin	2 / 15	13%	3.60 - 5.40	1.00 - 5.10	4.90 - 20.3	3.56	2.50	2.76	0.77
Vanadium	15 / 15	100%	0.030 - 0.68	0.020 - 0.040	0.19 - 0.20	0.16	0.14	0.16	0.96
Zinc	15 / 15	100%	19.7 - 90.3	0.10 - 0.70	0.50 - 2.00	51.2	52.4	21.2	0.41

Analyte	Frequency of Detection [a]	Percent Detected	Range of Detects (mg/kg) (Min - Max)	Range of Method Detection Limits (mg/kg) (Min - Max)	Range of Method Reporting Limits (mg/kg) (Min - Max)	Mean [b] (mg/kg)	Median [b] (mg/kg)	Standard Deviation [b]	Coefficient of Variation
Anions and Cations [c]									
Ammonia (as nitrogen) [d]	3 / 3	100%	533 - 960	19.0 - 19.0	31.0 - 31.0	815	952	244	0.30
Chloride [d]	3 / 3	100%	2710 - 23600	30.0 - 150	200 - 1000	10087	3950	11719	1.16
Cyanide	6 / 15	40%	0.38 - 87.0	0.14 - 3.10	0.64 - 11.0	6.31	0.35	22.3	3.54
Fluoride [d]	3 / 3	100%	13.2 - 30.0	0.20 - 0.50	2.00 - 10.0	19.1	14.2	9.42	0.49
Sodium	15 / 15	100%	54.9 - 4530	1.50 - 20.0	9.80 - 40.0	1006	412	1324	1.32
Sulfate [d]	3 / 3	100%	2040 - 15500	90.0 - 450	200 - 1000	6630	2350	7683	1.16

Notes:

a. Number of detected samples / total number of samples in data set.

b. When calculating the mean, median, and standard deviation, non-detect results were included as one-half the method detection limit. Non-detect results assigned a "U" or "UJ" qualifier were included as one-half the method reporting limit.

c. All data presented on a dry weight basis.

d. Analyses for ammonia (as nitrogen), chloride, fluoride, and sulfate were done only on samples collected in 2004.

TABLE 35.1-5

Grass and Sedge Vegetative Tissue Data Summary and Descriptive Statistics, 2004 through 2007

Analyte	Frequency of Detection [a]	Percent Detected	Range of Detects (mg/kg) (Min - Max)	Range of Method Detection Limits (mg/kg) (Min - Max)	Range of Method Reporting Limits (mg/kg) (Min - Max)	Mean [b] (mg/kg)	Median [b] (mg/kg)	Standard Deviation [b]	Coefficient of Variation
Trace Elements [c]									
Aluminum	13 / 14	93%	2.90 - 62.4	0.50 - 4.00	2.00 - 5.00	17.2	10.3	18.1	1.05
Antimony	7 / 14	50%	0.020 - 0.10	0.020 - 0.040	0.050 - 0.050	0.032	0.020	0.026	0.80
Arsenic	6 / 14	43%	0.070 - 0.18	0.050 - 0.060	0.49 - 0.51	0.063	0.028	0.054	0.86
Barium	14 / 14	100%	0.74 - 24.7	0.030 - 0.10	0.050 - 0.50	11.8	11.2	8.06	0.68
Beryllium	1 / 14	7%	0.0040 - 0.0040	0.0030 - 0.020	0.020 - 0.020	0.0042	0.0030	0.0032	0.76
Bismuth	1 / 14	7%	0.041 - 0.041	0.0030 - 0.0070	0.050 - 0.10	0.014	0.0030	0.019	1.40
Boron	14 / 14	100%	3.00 - 23.6	0.10 - 3.00	4.90 - 20.2	7.71	6.30	5.33	0.69
Cadmium	8 / 14	57%	0.0080 - 0.067	0.0060 - 0.020	0.049 - 0.051	0.022	0.010	0.021	0.95
Calcium	14 / 14	100%	1120 - 17000	1.50 - 2.00	4.90 - 10.1	3849	2625	4107	1.07
Chromium	6 / 14	43%	0.50 - 2.10	0.20 - 1.00	1.00 - 2.00	0.81	0.50	0.64	0.79
Cobalt	14 / 14	100%	0.011 - 0.11	0.0030 - 0.010	0.020 - 0.020	0.042	0.036	0.026	0.61
Copper	14 / 14	100%	3.06 - 9.63	0.020 - 0.10	0.10 - 0.10	5.38	4.92	2.22	0.41
Iron	14 / 14	100%	33.6 - 204	0.30 - 0.60	2.00 - 4.00	72.6	48.3	51.2	0.71
Lead	14 / 14	100%	0.020 - 0.65	0.020 - 0.020	0.050 - 0.050	0.18	0.090	0.21	1.17
Magnesium	14 / 14	100%	505 - 3200	0.20 - 1.00	2.00 - 4.00	1296	1120	642	0.50
Manganese	14 / 14	100%	10.7 - 598	0.020 - 0.070	0.49 - 2.02	174	120	166	0.95
Mercury	14 / 14	100%	0.0090 - 0.077	0.0020 - 0.010	0.017 - 0.020	0.030	0.019	0.023	0.76
Molybdenum	14 / 14	100%	0.10 - 3.58	0.010 - 0.020	0.050 - 0.050	0.76	0.56	0.92	1.21
Nickel	14 / 14	100%	0.29 - 3.47	0.030 - 0.090	0.20 - 0.20	1.75	1.87	1.02	0.58
Potassium	14 / 14	100%	6470 - 26800	2.50 - 202	196 - 404	14481	13550	6718	0.46
Selenium	4 / 14	29%	0.20 - 0.40	0.10 - 0.20	1.00 - 1.00	0.13	0.10	0.093	0.71
Silver	1 / 14	7%	0.0040 - 0.0040	0.0030 - 0.0080	0.020 - 0.020	0.0033	0.0035	0.00082	0.25
Thallium	4 / 14	29%	0.0020 - 0.0060	0.0020 - 0.020	0.020 - 0.020	0.0051	0.0040	0.0041	0.81
Tin	4 / 14	29%	3.30 - 5.50	1.00 - 5.10	4.90 - 20.2	4.68	2.90	3.07	0.66
Vanadium	12 / 14	86%	0.030 - 0.14	0.020 - 0.040	0.20 - 0.20	0.078	0.085	0.041	0.53
Zinc	14 / 14	100%	10.6 - 38.0	0.10 - 0.70	0.49 - 2.00	21.1	16.5	9.35	0.44

Analyte	Frequency of Detection [a]	Percent Detected	Range of Detects (mg/kg) (Min - Max)	Range of Method Detection Limits (mg/kg) (Min - Max)	Range of Method Reporting Limits (mg/kg) (Min - Max)	Mean [b] (mg/kg)	Median [b] (mg/kg)	Standard Deviation [b]	Coefficient of Variation
Anions and Cations [c]									
Ammonia (as nitrogen) [d]	3 / 3	100%	331 - 828	19.0 - 38.0	31.0 - 62.0	559	519	251	0.45
Chloride [d]	3 / 3	100%	5120 - 10400	40.0 - 50.0	250 - 330	7633	7380	2649	0.35
Cyanide	5 / 14	36%	0.21 - 2.10	0.11 - 0.30	0.60 - 0.94	0.33	0.15	0.52	1.57
Fluoride [d]	3 / 3	100%	13.1 - 15.1	0.30 - 0.30	2.50 - 3.30	14.4	14.9	1.10	0.077
Sodium	14 / 14	100%	34.0 - 2290	1.50 - 20.0	9.80 - 40.0	440	174	612	1.39
Sulfate [d]	3 / 3	100%	764 - 1780	120 - 150	250 - 340	1281	1300	508	0.40

Notes:

a. Number of detected samples / total number of samples in data set.

b. When calculating the mean, median, and standard deviation, non-detect results were included as one-half the method detection limit.
Non-detect results assigned a "U" or "UJ" qualifier were included as one-half the method reporting limit.

c. All data presented on a dry weight basis.

d. Analyses for ammonia (as nitrogen), chloride, fluoride, and sulfate were done only on samples collected in 2004.

TABLE 35.1-6

Lichen Vegetative Tissue Data Summary and Descriptive Statistics, 2004 through 2007

Analyte	Frequency of Detection [a]	Percent Detected	Range of Detects (mg/kg) (Min - Max)	Range of Method Detection Limits (mg/kg) (Min - Max)	Range of Method Reporting Limits (mg/kg) (Min - Max)	Mean [b] (mg/kg)	Median [b] (mg/kg)	Standard Deviation [b]	Coefficient of Variation
Trace Elements [c]									
Aluminum	5 / 5	100%	149 - 397	4.00 - 5.10	5.00 - 20.2	246	230	95.0	0.39
Antimony	5 / 5	100%	0.050 - 0.18	0.020 - 0.040	0.050 - 0.050	0.12	0.13	0.048	0.40
Arsenic	5 / 5	100%	0.070 - 0.16	0.050 - 0.050	0.50 - 0.51	0.11	0.12	0.038	0.34
Barium	5 / 5	100%	2.04 - 6.23	0.030 - 0.10	0.050 - 0.50	3.73	3.40	1.59	0.43
Beryllium	1 / 5	20%	0.0030 - 0.0030	0.0030 - 0.020	0.020 - 0.020	0.0041	0.0030	0.0034	0.82
Bismuth	2 / 5	40%	0.0050 - 0.020	0.0030 - 0.0070	0.049 - 0.10	0.0069	0.0035	0.0074	1.07
Boron	0 / 5	0%	NA - NA	0.10 - 3.00	5.00 - 20.1	NA	NA	NA	NA
Cadmium	5 / 5	100%	0.030 - 0.060	0.0060 - 0.020	0.050 - 0.051	0.043	0.045	0.012	0.27
Calcium	5 / 5	100%	507 - 2020	1.50 - 2.00	5.00 - 10.1	1085	1070	608	0.56
Chromium	5 / 5	100%	0.60 - 2.80	0.30 - 1.00	1.00 - 2.00	1.62	1.80	0.95	0.59
Cobalt	5 / 5	100%	0.062 - 0.093	0.0030 - 0.010	0.020 - 0.020	0.082	0.083	0.012	0.15
Copper	5 / 5	100%	0.75 - 2.34	0.020 - 0.10	0.10 - 0.10	1.35	1.21	0.59	0.44
Iron	5 / 5	100%	153 - 311	0.30 - 0.60	2.00 - 4.00	240	238	66.3	0.28
Lead	5 / 5	100%	0.60 - 1.18	0.020 - 0.020	0.050 - 0.050	0.91	0.88	0.23	0.26
Magnesium	5 / 5	100%	360 - 1060	0.20 - 1.00	2.00 - 4.00	702	612	318	0.45
Manganese	5 / 5	100%	17.4 - 72.2	0.030 - 0.070	0.50 - 2.02	41.5	38.5	19.8	0.48
Mercury	5 / 5	100%	0.019 - 0.038	0.0020 - 0.010	0.017 - 0.020	0.029	0.028	0.0068	0.24
Molybdenum	3 / 5	60%	0.060 - 0.13	0.010 - 0.020	0.050 - 0.050	0.072	0.060	0.051	0.70
Nickel	5 / 5	100%	0.58 - 6.27	0.030 - 0.050	0.20 - 0.20	2.28	1.58	2.33	1.02
Potassium	5 / 5	100%	549 - 1420	2.50 - 202	200 - 404	970	944	353	0.36
Selenium	4 / 5	80%	0.10 - 0.20	0.10 - 0.20	1.00 - 1.00	0.15	0.20	0.071	0.47
Silver	3 / 5	60%	0.0070 - 0.013	0.0030 - 0.0080	0.020 - 0.020	0.0072	0.0070	0.0040	0.56
Thallium	4 / 5	80%	0.0030 - 0.0070	0.0020 - 0.020	0.020 - 0.020	0.0062	0.0060	0.0026	0.42
Tin	1 / 5	20%	5.90 - 5.90	1.00 - 5.10	5.00 - 20.1	3.19	2.50	1.52	0.47
Vanadium	5 / 5	100%	0.38 - 0.77	0.020 - 0.040	0.20 - 0.20	0.51	0.43	0.16	0.31
Zinc	5 / 5	100%	7.38 - 18.0	0.20 - 0.70	0.50 - 2.00	13.6	14.8	4.04	0.30

Analyte	Frequency of Detection [a]	Percent Detected	Range of Detects (mg/kg) (Min - Max)	Range of Method Detection Limits (mg/kg) (Min - Max)	Range of Method Reporting Limits (mg/kg) (Min - Max)	Mean [b] (mg/kg)	Median [b] (mg/kg)	Standard Deviation [b]	Coefficient of Variation
Anions and Cations [c]									
Ammonia (as nitrogen) [d]	0 / 2	0%	NA - NA	7.50 - 7.50	13.0 - 13.0	NA	NA	NA	NA
Chloride [d]	2 / 2	100%	68.0 - 242	6.00 - 8.00	40.0 - 50.0	155	155	123	0.79
Cyanide	2 / 5	40%	0.25 - 0.42	0.060 - 0.50	0.30 - 1.40	0.43	0.42	0.27	0.62
Fluoride [d]	1 / 2	50%	0.30 - 0.30	0.20 - 0.30	2.00 - 2.50	0.20	0.20	0.14	0.71
Sodium	5 / 5	100%	153 - 974	1.50 - 20.0	10.0 - 40.0	426	386	327	0.77
Sulfate [d]	2 / 2	100%	118 - 134	18.0 - 24.0	40.0 - 50.0	126	126	11.3	0.090

Notes:

a. Number of detected samples / total number of samples in data set.

b. When calculating the mean, median, and standard deviation, non-detect results were included as one-half the method detection limit.
Non-detect results assigned a "U" or "UJ" qualifier were included as one-half the method reporting limit.

c. All data presented on a dry weight basis.

d. Analyses for ammonia (as nitrogen), chloride, fluoride, and sulfate were done only on samples collected in 2004.

TABLE 35.1-7
Moss Vegetative Tissue Data Summary and Descriptive Statistics, 2004 through 2007

Analyte	Frequency of Detection [a]	Percent Detected	Range of Detects (mg/kg) (Min - Max)	Range of Method Detection Limits (mg/kg) (Min - Max)	Range of Method Reporting Limits (mg/kg) (Min - Max)	Mean [b] (mg/kg)	Median [b] (mg/kg)	Standard Deviation [b]	Coefficient of Variation
Trace Elements [c]									
Aluminum	12 / 12	100%	75.1 - 8390	3.90 - 10.1	4.90 - 40.2	1371	696	2279	1.66
Antimony	10 / 12	83%	0.040 - 0.12	0.020 - 0.040	0.050 - 0.050	0.068	0.065	0.035	0.52
Arsenic	11 / 12	92%	0.070 - 1.65	0.050 - 0.060	0.49 - 0.51	0.31	0.18	0.44	1.42
Barium	12 / 12	100%	1.90 - 41.4	0.030 - 0.10	0.050 - 0.50	25.8	28.3	13.2	0.51
Beryllium	5 / 12	42%	0.0060 - 0.11	0.0030 - 0.020	0.019 - 0.020	0.018	0.0090	0.030	1.62
Bismuth	7 / 12	58%	0.010 - 0.050	0.0030 - 0.0070	0.049 - 0.10	0.026	0.024	0.019	0.72
Boron	9 / 12	75%	2.50 - 11.3	0.10 - 3.00	4.90 - 20.2	4.46	3.40	2.97	0.66
Cadmium	11 / 12	92%	0.026 - 0.84	0.0060 - 0.020	0.049 - 0.051	0.15	0.089	0.22	1.49
Calcium	12 / 12	100%	818 - 10100	1.50 - 2.00	4.90 - 10.1	4491	4320	2526	0.56
Chromium	10 / 12	83%	1.10 - 90.2	0.20 - 1.00	1.00 - 2.00	9.62	1.90	25.4	2.65
Cobalt	12 / 12	100%	0.032 - 2.92	0.0030 - 0.010	0.020 - 0.020	0.59	0.33	0.81	1.36
Copper	12 / 12	100%	1.70 - 19.1	0.020 - 0.10	0.10 - 0.10	6.82	4.82	5.00	0.73
Iron	12 / 12	100%	29.7 - 11100	0.30 - 0.60	2.00 - 4.10	1581	565	3050	1.93
Lead	12 / 12	100%	0.050 - 2.17	0.020 - 0.020	0.050 - 0.050	1.32	1.28	0.56	0.43
Magnesium	12 / 12	100%	768 - 3340	0.20 - 1.00	2.00 - 4.10	1757	1695	739	0.42
Manganese	12 / 12	100%	7.57 - 887	0.020 - 0.070	0.49 - 2.02	292	267	228	0.78
Mercury	12 / 12	100%	0.041 - 0.12	0.0020 - 0.010	0.017 - 0.028	0.070	0.060	0.031	0.45
Molybdenum	11 / 12	92%	0.060 - 0.52	0.010 - 0.020	0.050 - 0.050	0.16	0.11	0.14	0.87
Nickel	12 / 12	100%	1.10 - 209	0.030 - 0.090	0.19 - 0.20	24.0	3.83	58.8	2.45
Potassium	12 / 12	100%	430 - 9860	2.50 - 202	196 - 405	4629	4235	2714	0.59
Selenium	8 / 12	67%	0.20 - 0.40	0.10 - 0.20	1.00 - 1.00	0.25	0.30	0.13	0.53
Silver	12 / 12	100%	0.0070 - 0.025	0.0030 - 0.0080	0.020 - 0.020	0.013	0.012	0.0056	0.42
Thallium	11 / 12	92%	0.0070 - 0.030	0.0020 - 0.020	0.019 - 0.020	0.018	0.017	0.0098	0.55
Tin	3 / 12	25%	3.80 - 5.80	1.00 - 5.10	4.90 - 20.2	4.19	2.53	2.93	0.70
Vanadium	12 / 12	100%	0.030 - 19.0	0.020 - 0.040	0.19 - 0.20	2.77	1.05	5.20	1.88
Zinc	12 / 12	100%	7.40 - 99.2	0.10 - 0.70	0.50 - 2.00	31.6	30.7	23.9	0.76

Analyte	Frequency of Detection [a]	Percent Detected	Range of Detects (mg/kg) (Min - Max)	Range of Method Detection Limits (mg/kg) (Min - Max)	Range of Method Reporting Limits (mg/kg) (Min - Max)	Mean [b] (mg/kg)	Median [b] (mg/kg)	Standard Deviation [b]	Coefficient of Variation
Anions and Cations [c]									
Ammonia (as nitrogen) [d]	2 / 3	67%	3.80 - 52.2	3.80 - 7.50	6.20 - 13.0	19.9	3.80	28.0	1.40
Chloride [d]	3 / 3	100%	13.1 - 402	3.00 - 20.0	20.0 - 125	154	48.0	215	1.39
Cyanide	5 / 12	42%	0.22 - 0.80	0.10 - 0.77	0.50 - 2.60	0.39	0.34	0.22	0.56
Fluoride [d]	2 / 3	67%	5.80 - 9.60	0.20 - 0.70	2.00 - 3.40	5.25	5.80	4.65	0.89
Sodium	12 / 12	100%	24.4 - 424	1.50 - 20.0	9.80 - 40.0	248	265	127	0.51
Sulfate [d]	3 / 3	100%	21.0 - 584	9.00 - 60.0	20.0 - 125	226	72.0	311	1.38

Notes:

a. Number of detected samples / total number of samples in data set.

b. When calculating the mean, median, and standard deviation, non-detect results were included as one-half the method detection limit.
Non-detect results assigned a "U" or "UJ" qualifier were included as one-half the method reporting limit.

c. All data presented on a dry weight basis.

d. Analyses for ammonia (as nitrogen), chloride, fluoride, and sulfate were done only on samples collected in 2004.

TABLE 35.1-8

Shrub Vegetative Tissue Data Summary and Descriptive Statistics, 2004 through 2007

Analyte	Frequency of Detection [a]	Percent Detected	Range of Detects (mg/kg) (Min - Max)	Range of Method Detection Limits (mg/kg) (Min - Max)	Range of Method Reporting Limits (mg/kg) (Min - Max)	Mean [b] (mg/kg)	Median [b] (mg/kg)	Standard Deviation [b]	Coefficient of Variation
Trace Elements [c]									
Aluminum	46 / 46	100%	9.00 - 1070	0.50 - 10.1	2.00 - 40.2	116	42.3	234	2.03
Antimony	23 / 46	50%	0.020 - 0.13	0.020 - 0.040	0.050 - 0.050	0.038	0.025	0.030	0.79
Arsenic	12 / 46	26%	0.060 - 0.29	0.050 - 0.060	0.49 - 0.51	0.043	0.025	0.045	1.07
Barium	46 / 46	100%	2.10 - 83.2	0.020 - 0.10	0.050 - 0.50	26.7	21.2	20.1	0.75
Beryllium	1 / 46	2%	0.0050 - 0.0050	0.0030 - 0.020	0.020 - 0.020	0.0044	0.0030	0.0035	0.80
Bismuth	7 / 46	15%	0.0050 - 0.038	0.0030 - 0.0070	0.050 - 0.10	0.0079	0.0035	0.014	1.72
Boron	46 / 46	100%	5.30 - 57.5	0.10 - 3.00	4.90 - 20.2	23.5	20.5	12.7	0.54
Cadmium	32 / 46	70%	0.0070 - 2.70	0.0040 - 0.020	0.049 - 0.051	0.14	0.020	0.44	3.22
Calcium	46 / 46	100%	2750 - 31800	1.50 - 15.0	4.90 - 50.0	7820	5565	5666	0.72
Chromium	15 / 46	33%	0.30 - 6.10	0.20 - 1.00	1.00 - 2.00	0.63	0.40	0.92	1.47
Cobalt	46 / 46	100%	0.026 - 1.30	0.0030 - 0.010	0.020 - 0.020	0.15	0.077	0.24	1.66
Copper	46 / 46	100%	1.31 - 12.4	0.020 - 0.10	0.10 - 0.10	5.00	4.89	2.02	0.40
Iron	46 / 46	100%	19.3 - 996	0.30 - 0.60	1.90 - 4.10	94.9	48.0	193	2.03
Lead	46 / 46	100%	0.030 - 1.55	0.020 - 0.020	0.050 - 0.050	0.26	0.12	0.33	1.26
Magnesium	46 / 46	100%	1010 - 7660	0.20 - 2.00	1.90 - 4.10	2681	1710	1948	0.73
Manganese	46 / 46	100%	15.1 - 1770	0.020 - 0.35	0.49 - 9.88	401	296	378	0.94
Mercury	46 / 46	100%	0.0060 - 0.19	0.0010 - 0.016	0.015 - 0.032	0.037	0.028	0.031	0.83
Molybdenum	40 / 46	87%	0.030 - 2.78	0.010 - 0.020	0.050 - 0.050	0.36	0.13	0.60	1.68
Nickel	46 / 46	100%	0.68 - 17.0	0.030 - 0.090	0.20 - 0.20	3.04	2.00	3.24	1.07
Potassium	46 / 46	100%	3450 - 39200	2.40 - 204	194 - 2000	8763	6160	6623	0.76
Selenium	6 / 46	13%	0.10 - 0.40	0.10 - 0.20	1.00 - 1.00	0.086	0.10	0.056	0.66
Silver	6 / 46	13%	0.0030 - 0.030	0.0030 - 0.0080	0.019 - 0.020	0.0040	0.0030	0.0043	1.06
Thallium	21 / 46	46%	0.0020 - 0.092	0.0020 - 0.020	0.020 - 0.020	0.013	0.0040	0.023	1.78
Tin	6 / 46	13%	3.50 - 6.20	1.00 - 5.10	4.90 - 20.2	4.60	2.50	3.19	0.69
Vanadium	42 / 46	91%	0.020 - 1.70	0.020 - 0.040	0.20 - 0.20	0.20	0.14	0.31	1.51
Zinc	46 / 46	100%	8.68 - 148	0.10 - 0.70	0.49 - 2.00	27.6	18.4	26.4	0.96

Analyte	Frequency of Detection [a]	Percent Detected	Range of Detects (mg/kg) (Min - Max)	Range of Method Detection Limits (mg/kg) (Min - Max)	Range of Method Reporting Limits (mg/kg) (Min - Max)	Mean [b] (mg/kg)	Median [b] (mg/kg)	Standard Deviation [b]	Coefficient of Variation
Anions and Cations [c]									
Ammonia (as nitrogen) [d]	10 / 14	71%	6.00 - 1060	3.80 - 38.0	6.20 - 62.0	256	59.8	337	1.32
Chloride [d]	14 / 14	100%	29.0 - 11500	16.0 - 150	100 - 1000	2593	629	3388	1.31
Cyanide	13 / 46	28%	0.10 - 3.00	0.060 - 0.50	0.30 - 1.40	0.37	0.15	0.54	1.46
Fluoride [d]	13 / 14	93%	0.30 - 29.2	0.20 - 1.40	2.00 - 10.0	10.8	11.1	9.29	0.86
Sodium	46 / 46	100%	22.8 - 15900	1.50 - 20.0	9.70 - 40.0	1460	92.2	3407	2.33
Sulfate [d]	14 / 14	100%	174 - 8220	24.0 - 230	100 - 500	2186	659	2907	1.33

Notes:

a. Number of detected samples / total number of samples in data set.

b. When calculating the mean, median, and standard deviation, non-detect results were included as one-half the method detection limit.
Non-detect results assigned a "U" or "UJ" qualifier were included as one-half the method reporting limit.

c. All data presented on a dry weight basis.

d. Analyses for ammonia (as nitrogen), chloride, fluoride, and sulfate were done only on samples collected in 2004.

TABLE 35.1-9

Tree Vegetative Tissue Data Summary and Descriptive Statistics, 2004 through 2007

Analyte	Frequency of Detection [a]	Percent Detected	Range of Detects (mg/kg) (Min - Max)	Range of Method Detection Limits (mg/kg) (Min - Max)	Range of Method Reporting Limits (mg/kg) (Min - Max)	Mean [b] (mg/kg)	Median [b] (mg/kg)	Standard Deviation [b]	Coefficient of Variation
Trace Elements [c]									
Aluminum	19 / 19	100%	23.1 - 318	0.50 - 5.10	2.00 - 20.0	97.5	67.6	82.3	0.84
Antimony	14 / 19	74%	0.030 - 0.14	0.020 - 0.040	0.050 - 0.050	0.052	0.040	0.036	0.69
Arsenic	3 / 19	16%	0.050 - 0.13	0.050 - 0.060	0.49 - 0.51	0.034	0.025	0.025	0.73
Barium	19 / 19	100%	0.90 - 14.6	0.030 - 0.10	0.050 - 0.50	4.32	3.00	3.50	0.81
Beryllium	10 / 19	53%	0.0040 - 0.026	0.0030 - 0.020	0.020 - 0.020	0.0089	0.010	0.0055	0.62
Bismuth	3 / 19	16%	0.0040 - 0.033	0.0030 - 0.0070	0.049 - 0.10	0.011	0.0035	0.014	1.35
Boron	19 / 19	100%	7.40 - 30.5	0.10 - 3.00	4.90 - 20.2	16.2	16.0	6.39	0.40
Cadmium	8 / 19	42%	0.0080 - 0.066	0.0060 - 0.020	0.049 - 0.051	0.020	0.010	0.021	1.07
Calcium	19 / 19	100%	1830 - 7710	1.50 - 2.00	4.90 - 10.1	4684	4120	1872	0.40
Chromium	6 / 19	32%	0.40 - 0.90	0.20 - 1.00	1.00 - 2.00	0.45	0.40	0.13	0.28
Cobalt	19 / 19	100%	0.072 - 2.46	0.0030 - 0.010	0.020 - 0.020	0.43	0.32	0.51	1.19
Copper	19 / 19	100%	3.70 - 15.1	0.020 - 0.10	0.10 - 0.10	6.10	5.40	2.67	0.44
Iron	19 / 19	100%	38.8 - 113	0.30 - 0.60	2.00 - 4.10	57.8	48.2	20.2	0.35
Lead	19 / 19	100%	0.050 - 0.69	0.020 - 0.020	0.050 - 0.050	0.18	0.10	0.19	1.08
Magnesium	19 / 19	100%	968 - 3820	0.20 - 1.00	2.00 - 4.10	2029	2070	738	0.36
Manganese	19 / 19	100%	24.0 - 564	0.020 - 0.070	0.49 - 2.03	170	130	127	0.75
Mercury	19 / 19	100%	0.011 - 0.085	0.0010 - 0.012	0.014 - 0.024	0.040	0.029	0.024	0.59
Molybdenum	8 / 19	42%	0.020 - 0.73	0.010 - 0.020	0.050 - 0.050	0.079	0.025	0.16	2.05
Nickel	19 / 19	100%	0.70 - 4.16	0.030 - 0.090	0.20 - 0.20	2.19	2.17	0.89	0.41
Potassium	19 / 19	100%	4410 - 11200	2.50 - 203	196 - 406	8222	8390	1659	0.20
Selenium	0 / 19	0%	NA - NA	0.10 - 0.20	1.00 - 1.00	NA	NA	NA	NA
Silver	6 / 19	32%	0.0030 - 1.18	0.0030 - 0.0080	0.020 - 0.020	0.067	0.0040	0.27	4.05
Thallium	3 / 19	16%	0.0030 - 0.0050	0.0020 - 0.020	0.020 - 0.020	0.0048	0.0030	0.0042	0.88
Tin	4 / 19	21%	4.70 - 6.00	1.00 - 5.10	4.90 - 20.2	4.60	2.50	3.11	0.68
Vanadium	18 / 19	95%	0.030 - 0.23	0.020 - 0.040	0.20 - 0.20	0.13	0.16	0.075	0.57
Zinc	19 / 19	100%	14.8 - 49.7	0.10 - 0.70	0.50 - 2.00	29.3	25.7	10.1	0.35

Analyte	Frequency of Detection [a]	Percent Detected	Range of Detects (mg/kg) (Min - Max)	Range of Method Detection Limits (mg/kg) (Min - Max)	Range of Method Reporting Limits (mg/kg) (Min - Max)	Mean [b] (mg/kg)	Median [b] (mg/kg)	Standard Deviation [b]	Coefficient of Variation
Anions and Cations [c]									
Ammonia (as nitrogen) [d]	5 / 5	100%	31.6 - 102	3.80 - 38.0	6.20 - 65.0	50.9	39.9	29.0	0.57
Chloride [d]	5 / 5	100%	1380 - 4610	25.0 - 40.0	170 - 250	2664	2850	1310	0.49
Cyanide	4 / 19	21%	0.11 - 0.80	0.090 - 0.50	0.50 - 1.40	0.22	0.11	0.25	1.11
Fluoride [d]	4 / 5	80%	0.40 - 14.8	0.20 - 0.40	2.00 - 3.40	7.60	10.6	6.83	0.90
Sodium	19 / 19	100%	33.4 - 1510	1.50 - 20.0	9.80 - 40.0	324	226	335	1.04
Sulfate [d]	5 / 5	100%	288 - 1750	75.0 - 120	170 - 250	1020	897	568	0.56

Notes:

a. Number of detected samples / total number of samples in data set.

b. When calculating the mean, median, and standard deviation, non-detect results were included as one-half the method detection limit.
Non-detect results assigned a "U" or "UJ" qualifier were included as one-half the method reporting limit.

c. All data presented on a dry weight basis.

d. Analyses for ammonia (as nitrogen), chloride, fluoride, and sulfate were done only on samples collected in 2004.

TABLE 35.1-10

Mann-Whitney U-test Results, Comparison of Lingonberry Vegetative and Fruit Tissue Data, 2004 through 2007

Analyte	Rank Sum Berry	Rank Sum Vegetation	U	Z Adjusted	*P* Level	Valid Number Berry	Valid Number Vegetation	2*1 Sided
Trace Elements								
Aluminum	23.0	55.0	2.00	**-2.56**	**0.010**	6	6	**0.0087**
Antimony	42.5	35.5	14.5	0.56	0.58	6	6	0.59
Arsenic	38.5	39.5	17.5	-0.080	0.94	6	6	0.94
Barium	21.0	57.0	0	**-2.88**	**0.0039**	6	6	**0.0022**
Beryllium	39.0	39.0	18.0	0	1.00	6	6	NA
Bismuth	43.0	35.0	14.0	0.64	0.52	6	6	0.59
Boron	27.0	51.0	6.00	-1.92	0.055	6	6	0.0649
Cadmium	31.5	46.5	10.5	-1.20	0.23	6	6	0.24
Calcium	21.0	57.0	0	**-2.88**	**0.0039**	6	6	**0.0022**
Chromium	42.5	35.5	14.5	0.56	0.58	6	6	0.59
Cobalt	21.0	57.0	0	**-2.88**	**0.0039**	6	6	**0.0022**
Copper	30.0	48.0	9.00	-1.44	0.15	6	6	0.18
Iron	31.0	47.0	10.0	-1.28	0.20	6	6	0.24
Lead	30.5	47.5	9.50	-1.36	0.17	6	6	0.18
Magnesium	21.0	57.0	0	**-2.88**	**0.0039**	6	6	**0.0022**
Manganese	21.0	57.0	0	**-2.88**	**0.0039**	6	6	**0.0022**
Mercury	23.0	55.0	2.00	**-2.56**	**0.0104**	6	6	**0.0087**
Molybdenum	40.5	37.5	16.5	0.24	0.81	6	6	0.82
Nickel	33.0	45.0	12.0	-0.96	0.34	6	6	0.39
Potassium	53.0	25.0	4.00	**2.24**	**0.0250**	6	6	**0.026**
Selenium	36.0	42.0	15.0	-0.48	0.63	6	6	0.70
Silver	36.0	42.0	15.0	-0.48	0.63	6	6	0.70
Thallium	33.5	44.5	12.5	-0.88	0.38	6	6	0.39
Tin	40.0	38.0	17.0	0.16	0.87	6	6	0.94
Vanadium	27.0	51.0	6.00	-1.92	0.055	6	6	0.065
Zinc	21.0	57.0	0	**-2.88**	**0.0039**	6	6	**0.0022**

Analyte	Rank Sum Berry	Rank Sum Vegetation	U	Z Adjusted	*P* Level	Valid Number Berry	Valid Number Vegetation	2*1 Sided
Anions and Cations								
Chloride [a]	5.00	5.00	2.00	0	1.00	2	2	NA
Cyanide	38.5	39.5	17.5	-0.080	0.94	6	6	0.94
Fluoride [a]	3.00	7.00	0	-1.55	0.12	2	2	0.33
Ammonia (as nitrogen) [a]	7.00	3.00	0	1.54919	0.12	2	2	0.33
Sodium	46.0	32.0	11.0	1.12	0.26	6	6	0.31
Sulfate [a]	7.00	3.00	0	1.55	0.12	2	2	0.33

Notes:

a. Analyses for ammonia (as nitrogen), chloride, fluoride, and sulfate were done only on samples collected in 2004.

Results in red indicate a statistically significant difference in concentrations between vegetation and berries.

NA = Not applicable.

P level = Statistical test significance level (0.05).

U = Mann-Whitney statistic.

Z adjusted = Value normalized to the standard distribution.

2*1 sided = P value for Mann Whitney Test.

TABLE 35.1-11

Mann-Whitney U-test Results, Comparison of Crowberry Vegetative and Fruit Tissues, 2004 through 2007

Analyte	Rank Sum Berry	Rank Sum Vegetation	U	Z Adjusted	*P* Level	Valid Number Berry	Valid Number Vegetation	2*1 Sided
Trace Elements								
Aluminum	46.0	144	10.0	**-2.81**	**0.0050**	8	11	**0.0036**
Antimony	103	87.0	21.0	1.90	0.06	8	11	0.062
Arsenic	64.0	126	28.0	-1.32	0.19	8	11	0.21
Barium	36.0	154	0	**-3.63**	**0.0003**	8	11	**0.000026**
Beryllium	76.0	114	40.0	-0.33	0.74	8	11	0.78
Bismuth	82.0	108	42.0	0.17	0.87	8	11	0.90
Boron	36.0	154	0.0	**-3.63**	**0.00028**	8	11	**0.000026**
Cadmium	56.0	134	20.0	**-1.98**	**0.05**	8	11	**0.050621**
Calcium	36.0	154	0	**-3.63**	**0.00028**	8	11	**0.000026**
Chromium	71.5	119	35.5	-0.70	0.48	8	11	0.49
Cobalt	39.0	151	3.00	**-3.39**	**0.0007**	8	11	**0.000185**
Copper	72.5	118	36.5	-0.62	0.54	8	11	0.54
Iron	59.0	131	23.0	-1.73	0.08	8	11	0.091
Lead	63.5	127	27.5	-1.36	0.17	8	11	0.18
Magnesium	36.0	154	0	**-3.63**	**0.0003**	8	11	**0.000026**
Manganese	36.0	154	0	**-3.63**	**0.0003**	8	11	**0.000026**
Mercury	66.5	124	30.5	-1.11	0.26	8	11	0.27
Molybdenum	74.0	116	38.0	-0.50	0.62	8	11	0.66
Nickel	60.0	130	24.0	-1.65	0.10	8	11	0.11
Potassium	124	66.0	0	**3.63**	**0.0003**	8	11	**0.000026**
Selenium	80.0	110	44.0	0.00	1.00	8	11	NA
Silver	91.0	99.0	33.0	0.91	0.36	8	11	0.40
Thallium	76.5	114	40.5	-0.29	0.77	8	11	0.78
Tin	84.0	106	40.0	0.33	0.74	8	11	0.78
Vanadium	57.5	133	21.5	-1.86	0.06	8	11	0.062025
Zinc	46.0	144	10.0	**-2.81**	**0.0050**	8	11	**0.003599**

Analyte	Rank Sum Berry	Rank Sum Vegetation	U	Z Adjusted	*P* Level	Valid Number Berry	Valid Number Vegetation	2*1 Sided
Anions and Cations								
Chloride [a]	7.00	14.0	4.00	0	1.00	2	4	NA
Cyanide	84.5	105.5	39.5	0.37	0.71	8	11	0.72
Fluoride [a]	4.00	17.0	1.00	-1.39	0.16	2	4	0.27
Ammonia (as nitrogen) [a]	11.0	10.0	0.00	1.85	0.06	2	4	0.13
Sodium	123	67.0	1.00	**3.55**	**0.00038**	8	11	**0.000053**
Sulfate [a]	7.00	14.0	4.00	0.0	1.00	2	4	NA

Notes:

a. Analyses for ammonia (as nitrogen), chloride, fluoride, and sulfate were done only on samples collected in 2004.

Results in red indicate a statistically significant difference in concentrations between vegetation and berries.

NA = Not applicable.

P level = Statistical test significance level (0.05).

U = Mann-Whitney statistic.

Z adjusted = Value normalized to the standard distribution.

2*1 sided = P value for Mann Whitney Test.

TABLE 35.2-1
Target Analytes and Analytical Methods for Stream Sediment Samples, 2004 through 2007

Analyte	Method
Trace elements [a]	SW 6010/6020 (ICP/ICP-MS)/E200.7/E200.8
Mercury	SW7471 (CVAA)
Ammonia (as nitrogen)	SM4500NH3G
Cyanide, Total	SM4500CE/SW9012A
Chloride	E300.0
Fluoride	E300.0
Sulfate	E300.0
Sodium	SW6020
Acid-volatile Sulfide	Draft E1991
Simultaneously Extractable Metals	SW6010B/E200.7

Notes:

a. Ag, Al, As, B, Ba, Be, Bi, Ca, Cd, Co, Cr, Cu, Fe, Pb, K, Mg, Mn, Mo, Ni, S, Sb, Se, Sn, Tl, V, Zn (see Appendix D of this environmental baseline document for the definitions of these chemical abbreviations).

CVAA = Cold Vapor Atomic Absorption

E = Methods for Chemical Analysis of Inorganic Substances in Environmental Samples, EPA/600/R-93-100, August 1993, and Methods for the Determination of Metals in Environmental Samples, EPA/600/4-91-010, June 1991.

ICP = Inductively Coupled Plasma.

MS = Mass Spectrometry.

SM = Standard Methods for the Examination of Water and Wastewater, 20th Edition.

SW = U.S. Environmental Protection Agency Test Methods for Evaluating Solid Waste Physical/Chemical Methods, Third edition, September 1986.

TABLE 35.2-2

Sediment Data Summary and Descriptive Statistics, 2004 through 2007

Analyte	Frequency of Detection [a]	Percent Detected	Range of Detects (mg/kg) (Min - Max)	Range of Method Detection Limits (mg/kg) (Min - Max)	Range of Method Reporting Limits (mg/kg) (Min - Max)	Mean [b] (mg/kg)	Median [b] (mg/kg)	Standard Deviation [b]	Coefficient of Variation
Trace Elements [c]									
Aluminum	19 / 19	100%	6,470 - 44,000	6.16 - 97.0	19.9 - 196	16,141	15,500	8,074	0.50
Antimony	4 / 19	21%	0.041 - 0.093	0.0021 - 0.20	0.098 - 0.65	0.078	0.049	0.081	1.04
Arsenic	19 / 19	100%	0.83 - 13.1	0.0083 - 0.57	0.19 - 1.79	5.00	4.80	2.75	0.55
Barium	19 / 19	100%	9.40 - 114	0.00060 - 0.62	0.19 - 1.96	45.1	42.3	29.2	0.65
Beryllium	18 / 19	95%	0.064 - 0.30	0.017 - 0.20	0.098 - 0.65	0.13	0.13	0.052	0.40
Bismuth	0 / 19	0%	NA - NA	0.061 - 1.60	0.20 - 31.0	NA	NA	NA	NA
Boron	10 / 19	53%	1.68 - 44.5	0.37 - 6.20	1.19 - 77.0	5.43	2.52	9.69	1.79
Cadmium	14 / 19	74%	0.048 - 0.45	0.00050 - 0.41	0.19 - 1.31	0.18	0.15	0.13	0.72
Calcium	19 / 19	100%	800 - 9,960	0.54 - 615	29.3 - 1960	4,605	4,840	2,828	0.61
Chromium	19 / 19	100%	1.95 - 54.5	0.0081 - 0.17	0.19 - 0.65	24.9	22.0	16.4	0.66
Cobalt	19 / 19	100%	1.40 - 17.0	0.00080 - 0.98	0.19 - 3.27	9.50	9.75	4.61	0.49
Copper	19 / 19	100%	6.00 - 119	0.0011 - 1.18	0.19 - 3.92	42.5	41.7	26.2	0.62
Iron	18 / 19	95%	7,180 - 31,700	0.47 - 303	9.80 - 978	18,605	21,000	8,215	0.44
Lead	19 / 19	100%	0.44 - 5.27	0.0012 - 0.088	0.19 - 0.65	2.38	1.88	1.40	0.59
Magnesium	19 / 19	100%	980 - 15,800	3.40 - 615	29.3 - 1960	8,458	8,640	4717	0.56
Manganese	19 / 19	100%	47.0 - 662	0.0015 - 1.47	0.20 - 4.75	331	373	182	0.55
Mercury	5 / 19	26%	0.0092 - 0.10	0.0090 - 0.033	0.020 - 0.074	0.015	0.0079	0.021	1.46
Molybdenum	11 / 19	58%	0.31 - 22.0	0.00070 - 2.03	0.19 - 6.54	2.07	0.52	5.09	2.46
Nickel	19 / 19	100%	2.20 - 28.2	0.0019 - 0.41	0.19 - 1.31	13.5	14.0	7.53	0.56
Potassium	19 / 19	100%	51.0 - 1,800	4.90 - 203	97.8 - 654	570	504	424	0.74
Selenium	16 / 19	84%	0.17 - 3.20	0.013 - 0.98	0.48 - 3.27	0.78	0.45	0.78	1.00
Silver	3 / 19	16%	0.040 - 0.17	0.00050 - 0.044	0.098 - 0.65	0.073	0.021	0.086	1.18
Thallium	10 / 19	53%	0.013 - 0.11	0.0013 - 0.041	0.020 - 0.65	0.082	0.082	0.083	1.01
Tin	1 / 19	5%	1.90 - 1.90	0.0025 - 2.03	0.48 - 6.54	0.60	0.63	0.42	0.69
Vanadium	19 / 19	100%	28.9 - 108	0.0047 - 6.15	0.19 - 19.6	65.2	68.4	22.7	0.35
Zinc	19 / 19	100%	10.0 - 95.1	0.0088 - 2.03	0.48 - 6.54	47.5	45.6	26.4	0.56

Analyte	Frequency of Detection [a]	Percent Detected	Range of Detects (mg/kg) (Min - Max)	Range of Method Detection Limits (mg/kg) (Min - Max)	Range of Method Reporting Limits (mg/kg) (Min - Max)	Mean [b] (mg/kg)	Median [b] (mg/kg)	Standard Deviation [b]	Coefficient of Variation
Anions and Cations [c]									
Ammonia (as nitrogen)	17 / 19	89%	7.53 - 570	3.00 - 8.50	3.00 - 23.5	95.5	45.1	139	1.45
Chloride	13 / 19	68%	0.65 - 927	0.29 - 3.90	0.94 - 12.0	50.1	0.89	212	4.24
Cyanide	8 / 19	42%	0.032 - 16.0	0.027 - 3.40	0.054 - 3.40	1.48	0.036	4.10	2.77
Fluoride	3 / 19	16%	0.32 - 1.77	0.12 - 0.45	0.78 - 2.10	0.38	0.20	0.42	1.13
Sodium	19 / 19	100%	100 - 1,420	13.0 - 203	97.8 - 654	398	260	376	0.94
Sulfate	19 / 19	100%	1.13 - 157	0.29 - 3.60	0.94 - 11.0	14.5	3.41	35.3	2.44
Sulfur	4 / 4	100%	129 - 234	3.20 - 3.70	42.0 - 49.4	190	198	43.9	0.23
Miscellaneous Parameters [c]									
Acid Volatile Sulfide	0 / 4	0%	NA - NA	0.20 - 0.20	0.70 - 0.70	NA	NA	NA	NA

Notes:

a. Number of detected samples / total number of samples in data set.

b. When calculating the mean, median, and standard deviation, non-detect results were included as one-half the method detection limit.
Non-detect results assigned a "U" or "UJ" qualifier were included as one-half the method reporting limit.

c. All data presented on a dry weight basis.

TABLE 35.2-3

Simultaneously Extractable Metals in Sediment, Data Summary and Descriptive Statistics, 2006

Analyte	Frequency of Detection [a]	Percent Detected	Range of Detects (mg/kg) (Min - Max)	Range of Method Detection Limits (mg/kg) (Min - Max)	Range of Method Reporting Limits (mg/kg) (Min - Max)	Mean [b] (mg/kg)	Median [b] (mg/kg)	Standard Deviation [b]	Coefficient of Variation
Simultaneously Extracted Metals [c]									
Cadmium-SEM	2 / 5	40%	0.10 - 0.30	0.10 - 0.10	0.10 - 0.10	0.11	0.050	0.11	0.99
Copper-SEM	5 / 5	100%	4.30 - 29.4	0.10 - 0.20	0.10 - 0.20	12.3	7.90	10.1	0.83
Lead-SEM	2 / 5	40%	1.80 - 3.10	1.20 - 2.00	1.20 - 2.00	1.49	1.00	1.00	0.67
Mercury-SEM	0 / 5	0%	NA - NA	0.010 - 0.020	0.010 - 0.020	NA	NA	NA	NA
Nickel-SEM	5 / 5	100%	0.30 - 6.50	0.20 - 0.40	0.20 - 0.40	3.26	3.00	2.23	0.68
Zinc-SEM	5 / 5	100%	4.50 - 30.6	0.10 - 0.20	0.10 - 0.20	12.7	6.60	11.1	0.87

Notes:

a. Number of detected samples / total number of samples in data set.

b. When calculating the mean, median, and standard deviation, non-detect results were included as one-half the method detection limit. Non-detect results assigned a "U" or "UJ" qualifier were included as one-half the method reporting limit.

c. All data presented on a dry weight basis.

TABLE 35.3-1

Trace Elements in Fish, Data Summary and Descriptive Statistics, 2004 and 2005

Analyte	Frequency of Detection [a]	Percent Detected	Range of Detects (mg/kg) (Min - Max)	Range of Method Detection Limits (mg/kg) (Min - Max)	Range of Method Reporting Limits (mg/kg) (Min - Max)	Mean [b] (mg/kg)	Median [b] (mg/kg)	Standard Deviation [b]	Coefficient of Variation
Trace Elements [c]									
Antimony	3 / 32	9%	0.0050 - 0.0080	0.0050 - 0.0080	0.050 - 0.055	0.0033	0.0025	0.0012	0.37
Arsenic	32 / 32	100%	0.22 - 1.32	0.030 - 0.050	0.50 - 0.55	0.50	0.45	0.23	0.47
Beryllium [d]	7 / 10	70%	0.0030 - 0.015	0.0030 - 0.0030	0.020 - 0.020	0.0058	0.0050	0.0044	0.76
Cadmium	29 / 32	91%	0.0070 - 0.40	0.0040 - 0.0060	0.020 - 0.022	0.069	0.040	0.081	1.17
Chromium [d]	10 / 10	100%	1.30 - 21.5	0.30 - 0.30	0.50 - 0.50	5.96	3.40	6.44	1.08
Copper	32 / 32	100%	3.42 - 17.0	0.020 - 0.080	0.10 - 0.11	6.75	5.50	3.02	0.45
Lead	31 / 32	97%	0.015 - 0.36	0.0070 - 0.020	0.020 - 0.022	0.096	0.070	0.092	0.96
Mercury	32 / 32	100%	0.016 - 0.13	0.00030 - 0.0015	0.0010 - 0.0050	0.062	0.062	0.022	0.36
Molybdenum [d]	10 / 10	100%	0.060 - 0.29	0.050 - 0.050	0.050 - 0.050	0.15	0.14	0.065	0.45
Nickel	32 / 32	100%	0.40 - 20.6	0.020 - 0.030	0.200 - 0.220	2.79	1.19	4.27	1.53
Selenium	32 / 32	100%	0.80 - 4.60	0.30 - 0.40	1.00 - 1.10	1.91	1.45	1.06	0.56
Silver	26 / 32	81%	0.0040 - 0.29	0.0020 - 0.0040	0.020 - 0.022	0.016	0.0070	0.051	3.10
Thallium [d]	8 / 10	80%	0.022 - 0.028	0.0020 - 0.0020	0.020 - 0.020	0.021	0.023	0.0063	0.29
Zinc [d]	10 / 10	100%	129 - 172	0.070 - 0.070	0.50 - 0.50	151	151	14.6	0.096

Notes:

a. Number of detected samples / total number of samples in data set.

b. When calculating the mean, median, and standard deviation, non-detect results were included as one-half the method detection limit.
Non-detect results assigned a "U" or "UJ" qualifier were included as one-half the method reporting limit.

c. Data are reported on a dry weight basis.

TABLE 35.3-2

Trace Elements in Coho Salmon (Onchorhynchus kisutch) from Y-Valley Creek, Data Summary and Descriptive Statistics, 2004

Analyte	Frequency of Detection [a]	Percent Detected	Range of Detects (mg/kg) (Min - Max)	Range of Method Detection Limits (mg/kg) (Min - Max)	Range of Method Reporting Limits (mg/kg) (Min - Max)	Mean [b] (mg/kg)	Median [b] (mg/kg)	Standard Deviation [b]	Coefficient of Variation
Trace Elements [c]									
Antimony	1 / 11	9%	0.0050 - 0.0050	0.0050 - 0.0060	0.0500 - 0.0500	0.0028	0.0025	0.00075	0.27
Arsenic	11 / 11	100%	0.22 - 0.47	0.030 - 0.030	0.500 - 0.550	0.34	0.36	0.088	0.26
Cadmium	11 / 11	100%	0.035 - 0.11	0.0050 - 0.0060	0.0200 - 0.0220	0.054	0.041	0.025	0.46
Copper	11 / 11	100%	3.42 - 13.0	0.070 - 0.080	0.100 - 0.110	6.23	5.21	3.18	0.51
Lead	11 / 11	100%	0.053 - 0.35	0.0070 - 0.0080	0.0200 - 0.0220	0.15	0.11	0.10	0.69
Mercury	11 / 11	100%	0.058 - 0.13	0.0003 - 0.0008	0.0010 - 0.0025	0.075	0.070	0.018	0.25
Nickel	11 / 11	100%	0.77 - 2.37	0.030 - 0.030	0.200 - 0.220	1.19	1.02	0.45	0.37
Selenium	11 / 11	100%	0.90 - 1.80	0.40 - 0.40	1.00 - 1.10	1.22	1.20	0.26	0.21
Silver	6 / 11	55%	0.0040 - 0.29	0.0040 - 0.0040	0.0200 - 0.0220	0.030	0.0040	0.087	2.91

Notes:

a. Number of detected samples / total number of samples in data set.

b. When calculating the mean, median, and standard deviation, non-detect results were included as one-half the method detection limit.
Non-detect results assigned a "U" or "UJ" qualifier were included as one-half the method reporting limit.

c. Data are reported on a dry weight basis.

TABLE 35.3-3

Trace Elements in Dolly Varden (Salvelinus malma walbaum) from the Unnamed Creek, Data Summary and Descriptive Statistics, 2004

Analyte	Frequency of Detection [a]	Percent Detected	Range of Detects (mg/kg) (Min - Max)	Range of Method Detection Limits (mg/kg) (Min - Max)	Range of Method Reporting Limits (mg/kg) (Min - Max)	Mean [b] (mg/kg)	Median [b] (mg/kg)	Standard Deviation [b]	Coefficient of Variation
Trace Elements [c]									
Antimony	1 / 11	9%	0.0050 - 0.0050	0.0050 - 0.0050	0.0500 - 0.0500	0.0027	0.0025	0.00075	0.28
Arsenic	11 / 11	100%	0.32 - 1.32	0.030 - 0.030	0.500 - 0.500	0.63	0.55	0.29	0.46
Cadmium	8 / 11	73%	0.0070 - 0.021	0.0050 - 0.0050	0.0200 - 0.0200	0.0091	0.0090	0.0056	0.61
Copper	11 / 11	100%	4.51 - 9.61	0.070 - 0.070	0.100 - 0.100	6.46	5.51	1.83	0.28
Lead	11 / 11	100%	0.015 - 0.094	0.0070 - 0.0070	0.0200 - 0.0200	0.041	0.028	0.029	0.71
Mercury	11 / 11	100%	0.016 - 0.11	0.0008 - 0.0015	0.0025 - 0.0050	0.063	0.059	0.026	0.41
Nickel	11 / 11	100%	0.40 - 3.94	0.030 - 0.030	0.200 - 0.200	1.27	0.78	1.17	0.92
Selenium	11 / 11	100%	0.80 - 1.70	0.40 - 0.40	1.00 - 1.00	1.30	1.30	0.29	0.22
Silver	10 / 11	91%	0.0060 - 0.016	0.0040 - 0.0040	0.0200 - 0.0200	0.0088	0.0070	0.0043	0.48

Notes:

a. Number of detected samples / total number of samples in data set.

b. When calculating the mean, median, and standard deviation, non-detect results were included as one-half the method detection limit.
Non-detect results assigned a "U" or "UJ" qualifier were included as one-half the method reporting limit.

c. Data are reported on a dry weight basis.

TABLE 35.3-4

Trace Elements in Dolly Varden (Salvelinus malma walbaum) from Y-Valley Creek, Data Summary and Descriptive Statistics, 2005

Analyte	Frequency of Detection [a]	Percent Detected	Range of Detects (mg/kg) (Min - Max)	Range of Method Detection Limits (mg/kg) (Min - Max)	Range of Method Reporting Limits (mg/kg) (Min - Max)	Mean [b] (mg/kg)	Median [b] (mg/kg)	Standard Deviation [b]	Coefficient of Variation
Trace Elements [c]									
Antimony	1 / 10	10%	0.0080 - 0.0080	0.0080 - 0.0080	0.0500 - 0.0500	0.0044	0.0040	0.0013	0.29
Arsenic	10 / 10	100%	0.30 - 0.91	0.050 - 0.050	0.500 - 0.500	0.52	0.50	0.17	0.34
Beryllium [d]	7 / 10	70%	0.0030 - 0.015	0.0030 - 0.0030	0.0200 - 0.0200	0.0058	0.0050	0.0044	0.76
Cadmium	10 / 10	100%	0.075 - 0.40	0.0040 - 0.0040	0.0200 - 0.0200	0.15	0.12	0.098	0.64
Chromium [d]	10 / 10	100%	1.30 - 21.5	0.30 - 0.30	0.50 - 0.50	5.96	3.40	6.44	1.08
Copper	10 / 10	100%	3.92 - 17.0	0.020 - 0.020	0.100 - 0.100	7.65	6.77	3.89	0.51
Lead	9 / 10	90%	0.050 - 0.36	0.020 - 0.020	0.020 - 0.020	0.098	0.065	0.097	0.99
Mercury	10 / 10	100%	0.035 - 0.068	0.0006 - 0.0006	0.002 - 0.002	0.048	0.047	0.012	0.24
Molybdenum [d]	10 / 10	100%	0.060 - 0.29	0.050 - 0.050	0.050 - 0.050	0.15	0.14	0.065	0.45
Nickel	10 / 10	100%	1.02 - 20.6	0.020 - 0.020	0.200 - 0.200	6.23	3.51	6.47	1.04
Selenium	10 / 10	100%	2.40 - 4.60	0.30 - 0.30	1.00 - 1.00	3.33	3.15	0.64	0.19
Silver	10 / 10	100%	0.0070 - 0.013	0.0020 - 0.0020	0.0200 - 0.0200	0.0096	0.010	0.0020	0.20
Thallium [d]	8 / 10	80%	0.022 - 0.028	0.0020 - 0.0020	0.0200 - 0.0200	0.021	0.023	0.0063	0.29
Zinc [d]	10 / 10	100%	129 - 172	0.070 - 0.070	0.500 - 0.500	151	151	14.6	0.096

Notes:

a. Number of detected samples / total number of samples in data set.

b. When calculating the mean, median, and standard deviation, non-detect results were included as one-half the method detection limit.
Non-detect results assigned a "U" or "UJ" qualifier were included as one-half the method reporting limit.

c. Data are reported on a dry weight basis.

TABLE 35.4-1
Marine Sampling Stations, Trace Elements Study, Cook Inlet, 2004-2008

Station [a]	Sample Type	Number of Samples 2004	2005	2008
Intertidal Sediment [b]				
MPS3		2 (M/L)	1 (M)	3 (M/L) [c]
MPSE		1 (M)	1 (M)	1 (M)
MBSA1		NS	1 (M)	1 (M)
MPS4		2 (M/L)	1 (L)	1 (M)
MPS1A		NS	1 (M)	NS
MPS1		2 (M/L)	NS	NS
MPS2		2 (M/L)	1 (L)	1 (L)
MBB		1 (L) (GS)	1 (L)	2 (L) [c]
Subtidal Sediment [d]				
MPS4		5	NS	5
MWGI		1 [e]	NS	NS
MOPP1		1	NS	5
MPS1		5	NS	6 [c]
MPS2		5	NS	NS
Plant/Invertebrate Tissue				
MPS3	Plant	NS	NS	1/1
	Bivalve	2/2	NS	1/1
MPSE	Bivalve	1/1	NS	NS
MPS4	Plant	NS	NS	3/1
	Bivalve	2/2	NS	4/1 [f]
MPS1	Plant	NS	NS	NS
	Bivalve	2/2	NS	NS
MPS11dx	Gastropod	2/2	NS	NS
	Crustacean	1/1	NS	NS
MPS1B	Plant	NS	NS	3/1
	Bivalve	NS	NS	4/1 [f]
MPS1Bdx	Bivalve	2/2	NS	NS
MPS2	Plant	NS	NS	1/1
	Bivalve	1/1	NS	1/1
MPS2Cr	Crustacean	2/2	NS	NS
Fish Tissue [g]				
Iliamna Bay	Fish	2/1	9/4	28/5 [h]
Y-Valley	Fish	NS	NS	8/3
Iniskin Bay	Fish	3/2	2/2	19/3

Notes:

a. Locations are listed in approximate geographic order from west to east.

b. The letters “M” or “L” in parentheses after the numbers of samples for intertidal sediment indicate that samples were collected from the middle or low tidal elevations, respectively.

c. One of the samples was a subsurface sample.

d. For subtidal sediments, slightly different locations were sampled for each event.

e. Sample analyzed for inorganic substances only.

f. Two of the mussel samples from this station were replicate samples whose results were averaged for subsequent data evaluation.

g. First number indicates the number of samples/second number indicates the number of taxa sampled.

h. Number of taxa for Dolly Varden includes life stages; the juvenile stage and the adult stage are counted as though they were separate taxa.

GS = sampled analyzed for grain size only.

NS = not sampled.

TABLE 35.4-2
Analytes Measured in Marine Sediment Samples, 2004-2008

Analyte	Year 2004	Year 2005	Year 2008	Analyte	Year 2004	Year 2005	Year 2008
Physical/Chemical Properties				**Inorganic Substances**			
Total Organic Carbon	•	•	•	Aluminum	•	•	•
Grain Size	•		•	Antimony	•	•	•
				Arsenic	•	•	•
Organic Compounds				Barium	•	•	•
Benzene	•	•		Beryllium	•	•	
Ethylbenzene	•	•		Bismuth	•	•	
Toluene	•	•		Boron	•	•	
Xylenes	•	•		Cadmium	•	•	•
				Calcium	•	•	
Diesel-range Organics	•	•		Chloride	•	•	
Gasoline-range Organics	•	•		Chromium	•	•	•
Residual-range Organics	•	•		Cobalt	•	•	•
				Copper	•	•	•
Polynuclear Aromatic Hydrocarbons:				Cyanide	•	•	•
2-Methylnaphthalene		•		Fluoride	•	•	
Acenaphthene		•		Iron	•	•	•
Acenaphthylene		•		Lead	•	•	•
Anthracene		•		Magnesium	•	•	
Benzo(a)anthracene		•		Manganese	•	•	•
Benzo(a)pyrene		•		Mercury	•	•	•
Benzo(b)fluoranthene		•		Molybdenum	•	•	
Benzo(g,h,i)perylene		•		Nickel	•	•	•
Benzo(k)fluoranthene		•		Potassium	•	•	
Chrysene		•		Selenium	•	•	•
Dibenzo(a,h)anthracene		•		Silver	•	•	•
Dibenzofuran		•		Sodium	•	•	
Fluoranthene		•		Sulfate	•	•	
Fluorene		•		Thallium	•	•	
Indeno(1,2,3-cd)pyrene		•		Tin	•	•	•
Naphthalene		•		Vanadium	•	•	
Phenanthrene		•		Zinc	•	•	•
Pyrene		•					
				Acid Volatile Sulfide			•
Aliphatic Hydrocarbons [a]			•	Cadmium-SEM			•
Polynuclear Aromatic Hydrocarbons (46 compounds) [a]			•	Copper-SEM			•
				Lead-SEM			•
Nitrogen and Compounds				Mercury-SEM			•
Ammonia (as Nitrogen)	•	•		Nickel-SEM			•
Kjeldahl Nitrogen, Total	•	•		Zinc-SEM			•

Notes:

a. Table 35.4-3 lists the aliphatic hydrocarbons and polynuclear aromatic hydrocarbons measured in 2008 samples

SEM = simultaneously extractable metal.

TABLE 35.4-3

List of Aliphatic Hydrocarbon and Polynuclear Aromatic Hydrocarbon Analytes, 2008

AHC Name	Abbreviation [a]	PAH Name	Abbreviation [b]
n-Decane	n-C10	Naphthalene	N
n-Undecane	n-C11	C1-Naphthalene	N1
n-Dodecane	n-C12	C2-Naphthalene	N2
n-Tridecane	n-C13	C3-Naphthalene	N3
n-Tetradecane	n-C14	C4-Naphthalene	N4
n-Pentadecane	n-C15	Biphenyl	Bi
n-Hexadecane	n-C16	Acenaphthylene	Acn
n-Heptadecane	n-C17	Acenaphthene	Ace
Pristane	Pristane	Fluorene	F
n-Octadecane	n-C18	C1-Fluorenes	F1
Phytane	Phytane	C2-Fluorenes	F2
n-Nonadecane	n-C19	C3-Fluorenes	F3
n-Eicosane	n-C20	Phenanthrene	Ph
n-Heneicosane	n-C21	Anthracene	A
n-Docosane	n-C22	C1-Phenanthrene/Anthracene	Ph1
n-Tricosane	n-C23	C2-Phenanthrene/Anthracene	Ph2
n-Tetracosane	n-C24	C3-Phenanthrene/Anthracene	Ph3
n-Pentacosane	n-C25	C4-Phenanthrene/Anthracene	Ph4
n-Hexacosane	n-C26	Dibenzothiophene	Db
n-Heptacosane	n-C27	C1-Dibenzothiophene	Db1
n-Octacosane	n-C28	C2-Dibenzothiophene	Db2
n-Nonacosane	n-C29	C3-Dibenzothiophene	Db3
n-Triacontane	n-C30	Fluoranthene	Fl
n-Hentriacontane	n-C31	Pyrene	P
n-Dotriacontane	n-C32	C1-Fluoranthene/Pyrene	FP1
n-Tritriacontane	n-C33	C2-Fluoranthene/Pyrene	FP2
n-Tetratriacontane	n-C34	C3-Fluoranthene/Pyrene	FP3
n-Pentatriacontane	n-C35	Benzo(a)Anthracene	Ba
		Chrysene	C
		C1-Chrysenes	C1
		C2-Chrysenes	C2
		C3-Chrysenes	C3
		C4-Chrysenes	C4
		Benzo(b)fluoranthene	Bb
		Benzo(k)fluoranthene	Bk
		Benzo(e)pyrene	Bep
		Benzo(a)pyrene	Bap
		Perylene	Per
		Indeno(1,2,3-cd)pyrene	Nd
		Dibenzo(a,h)anthracene	Dbn
		Benzo(g,h,i)perylene	Bp
		2-Methylnaphthalene	(c)
		1-Methylnaphthalene	(c)
		2,6-Dimethylnaphthalene	(c)
		1,6,7-Trimethylnaphthalene	(c)
		1-Methylphenanthrene	(c)

a. Abbreviations in this column are used on Figures 35.4-11 and 35.4-12.

b. Abbreviations in this column are used on Figures 35.4-13 and 35.4-14.

c. Analytes not used in Figures 35.4-13 and 35.4-14.

AHC = aliphatic hydrocarbons; PAH = polynuclear aromatic hydrocarbons.

TABLE 35.4-4
Analytes Measured in Marine Tissue Samples, 2004-2008

Analyte	Year 2004	Year 2005	Year 2008
Basic Properties			
Total Lipids			m
Total Solids	•	•	•
Inorganic Constituents			
Antimony	•	•	•
Arsenic	•	•	•
Beryllium		•	•
Boron			•
Cadmium	•	•	•
Chromium		•	•
Copper	•	•	•
Lead	•	•	•
Mercury	•	•	•
Molybdenum		•	•
Nickel	•	•	•
Selenium	•	•	•
Silver	•	•	•
Thallium		•	•
Tin			•
Zinc		•	•
Organic Compounds			
Aliphatic Hydrocarbons [a]			m
Polynuclear Aromatic Hydrocarbons (46 compounds) [a]			m

Notes:
a. Table 35.4-3 lists the aliphatic hydrocarbons and polynuclear aromatic hydrocarbons measured in 2008 samples.
m = analyte measured only in mussels (*Mytilus trossulus*).

TABLE 35.4-5
Species Sampled for Tissue Analysis, Common and Scientific Names

	Common Name	Scientific Name
Plants	Rockweed	*Fucus distichus* ssp. *evanescens*
Crustaceans	Lyre Crab	*Hyas lyratus*
	Helmet Crab	*Telmessus cheiragonus*
Gastropods	Oregon Triton	*Fusitriton oregonensis*
	Lyre Whelk	*Neptunea lyrata*
Bivalves	Cockle	*Clinocardium nuttalli*
	Oblique Macoma	*Macoma obliqua*
	Surf Clam	*Mactromeris polynyma*
	Horse Mussel	*Modiolus modiolus*
	Eastern Softshell Clam	*Mya arenaria*
	Mussel	*Mytilus trossulus*
Fish	Chum Salmon	*Oncorhynchus keta*
	Pink Salmon	*Oncorhynchus gorbuscha*
	Dolly Varden	*Salvelinus malma*
	Starry Flounder	*Platichthys stellatus* [a]
	Yellowfin Sole	*Limanda aspera*
	White Spot Greenling	*Hexagrammos stelleri*
	Pacific Staghorn Sculpin	*Leptocottus armatus* [b]
	Pacific Halibut	*Hippoglossus stenolepis*

Notes:

a. Sometimes identified as *Pleuronectidae* family in sample identifications shown in Appendix 35.4C.

b. Sometimes identified as *Cottidae* sp. in sample identifications shown in Appendix 35.4C.

TABLE 35.4-6
Analytical Results for Intertidal Sediment: Part One Constituents [a], Grain Size, and Total Organic Carbon, 2004-2008

Station [b]	Year	Grain Size (% fines)[c]	TOC	Antimony (µg/kg)	Arsenic (µg/kg)	Cadmium (µg/kg)	Chromium (µg/kg)	Copper (µg/kg)	Lead (µg/kg)	Mercury (µg/kg)	Nickel (µg/kg)	Selenium (µg/kg)	Silver (µg/kg)	Zinc (µg/kg)
Surface Sediment														
MPS3M	2004	18.0%	0.507%	86	6,530	**31**	22,900	56,800	2,570	26	16,700	483	102	66,500
MPS3M	2005	NA	0.880%	140	12,100	82	33,600	45,600	8,640	60	31,000	800	123	98,400
MPS3M	2008	15.9%	1.210%	130	4,130	55	13,300	20,700	3,650	28	9,740	600	77	30,500
MPS3L	2004	90.0%	1.280%	168	20,700	88	34,000	40,800	6,530	53	27,800	800	153	83,900
MPS3L	2008	95.8%	0.810%	140	7,530	75	21,200	23,600	7,150	54	16,700	600	134	46,200
MPSEM	2004	51.0%	0.632%	136	9,330	64	28,700	32,700	5,160	45	22,800	435	126	67,700
MPSEM	2005	NA	0.930%	190	12,900	81	37,800	51,200	10,400	68	33,500	800	138	101,000
MPSEM	2008	91.3%	0.710%	110	7,200	67	22,700	23,900	6,990	49	16,400	500	117	46,400
MBSA1M	2005	NA	0.160%	60	2,750	70	10,000	36,600	2,080	22	7,680	**100**	58	35,100
MBSA1M	2008	18.3%	0.330%	60	4,440	95	18,400	27,500	4,300	16	12,100	**150**	77	43,700
MPS4M	2004	74.0%	0.521%	81	6,660	**31**	24,400	24,800	3,500	29	18,500	428	56	53,700
MPS4M	2008	1.6%	0.480%	80	2,540	56	13,600	18,400	1,520	3	8,410	**200**	**9**	25,000
MPS4L	2004	NA	0.782%	110	11,100	**30**	28,200	25,800	4,540	35	22,400	596	88	62,300
MPS4L	2005	NA	0.580%	120	6,770	69	21,100	26,300	4,180	38	18,200	400	75	48,700
MPS1AM	2005	NA	0.660%	70	2,970	67	19,300	18,800	2,370	15	13,200	**100**	24	31,000
MPS1M	2004	1.1%	0.109%	33	2,430	73	32,400	18,600	2,310	**6**	16,200	**75**	50	40,400
MPS1L	2004	NA	0.135%	44	3,570	64	23,500	18,200	2,510	**6**	13,700	**74**	51	40,300
MPS2M	2004	93.0%	0.376%	98	6,640	**30**	17,100	18,500	3,100	20	13,400	364	90	53,300
MPS2L	2004	NA	0.735%	147	12,600	**30**	31,300	31,800	6,130	45	26,400	400	98	75,000
MPS2L	2005	NA	0.580%	140	10,400	72	29,300	35,300	7,210	51	24,100	600	90	75,900
MPS2L	2008	92.3%	0.970%	140	7,820	71	19,600	18,400	7,190	54	15,300	600	111	41,800
MBBL	2004	42.0%	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MBBL	2005	NA	0.270%	140	5,930	62	14,000	25,600	3,930	36	12,200	300	56	47,000
MBBL	2008	64.8%	0.480%	100	6,180	50	14,500	14,600	5,210	73	11,700	500	67	34,700
Subsurface Sediment														
MPS3L	2008	87.6%	0.690%	140	5,620	77	19,900	22,800	7,200	100	15,200	500	125	43,000
MBBL	2008	27.9%	0.300%	90	5,190	41	11,400	13,600	4,550	30	9,260	**200**	61	33,100
Comparison Values														
Alaskan Rock (high) [d]		NC	NC	NC	39,000	NC	84,000	75,000	25,000	NC	47,000	NC	NC	288,000
Alaskan Rock (low) [d]		NC	NC	NC	8,000	NC	47,000	16,000	6,000	NC	19,000	NC	NC	96,000
Average Continental Crust [d]		NC	NC	300	1,700	100	126,000	25,000	14,800	40	56,000	NC	70	65,000
SQuiRT [e]		NC	NC	630	7,240	380	49,000	18,700	30,000	130	15,000	1,000	230	94,000

Notes:

a. "Part One constituents" are those inorganic constituents for which there are SQuiRT values for comparison.

b. The letters "M" or "L" at the end of the station code indicate the tidal elevation where the sample was collected, i.e., middle or lower, respectively.

c. Measured as percentage passing 75 microns in 2004 and 63 microns in 2008.

d. Source: Saupe et al., 2005.

e. Source: Buchman, 2008.

Results are reported on a dry weight basis.

Concentrations measured below the limit of detection are indicated by **bold** text.

NA = analysis not performed.

NC = no comparison value available

TOC = total organic carbon.

µg/kg = micrograms per kilogram. (Data in analytical results tables in appendices are presented in milligrams per kilogram [mg/kg]; 1 mg/kg equals 1,000 µg/kg.)

TABLE 35.4-7
Analytical Results for Intertidal Sediment: Part Two Constituents[a], 2004-2008

Station [b]	Year	Aluminum (µg/kg)	Barium (µg/kg)	Beryl-lium (µg/kg)	Bismuth (µg/kg)	Boron (µg/kg)	Cobalt (µg/kg)	Cyanide (µg/kg)	Iron (µg/kg)	Manga-nese (µg/kg)	Molyb-denum (µg/kg)	NH3-N (µg/kg)	TKN (µg/kg)	Thallium (µg/kg)	Tin (µg/kg)	Vanadium (µg/kg)
Surface Sediment																
MPS3M	2004	17,700,000	57,900	216	**31**	11,900	13,700	92	24,700,000	538,000	487	48,900	680,000	39	**493**	70,300
MPS3M	2005	20,000,000	129,000	404	206	22,200	12,600	**35**	31,000,000	483,000	1,060	20,200	886,000	166	**3,300**	74,600
MPS3M	2008	13,200,000	58,700	NA	NA	NA	5,530	**180**	20,300,000	283,000	NA	NA	NA	NA	360	NA
MPS3L	2004	17,800,000	122,000	344	114	11,400	12,100	200	32,600,000	503,000	2,340	506,000	1,690,000	110	1,160	71,200
MPS3L	2008	17,100,000	102,000	NA	NA	NA	7,950	**45**	27,100,000	425,000	NA	NA	NA	NA	**4,450**	NA
MPSEM	2004	14,900,000	103,000	269	82	9,760	10,000	120	24,400,000	389,000	808	71,200	1,030,000	103	1,020	61,100
MPSEM	2005	20,600,000	133,000	383	231	19,900	13,900	70	32,900,000	509,000	1,260	14,100	819,000	183	9,200	76,300
MPSEM	2008	19,900,000	108,000	NA	NA	NA	8,130	3,620	29,300,000	450,000	NA	NA	NA	NA	550	NA
MBSA1M	2005	18,500,000	26,100	73	26	13,700	13,600	**35**	29,600,000	714,000	431	1,300	94,000	17	**4,250**	77,600
MBSA1M	2008	22,400,000	52,600	NA	NA	NA	8,870	**40**	31,200,000	689,000	NA	NA	NA	NA	360	NA
MPS4M	2004	14,200,000	68,200	168	**31**	11,500	8,900	67	21,600,000	397,000	402	59,200	539,000	**3**	1,060	56,700
MPS4M	2008	13,700,000	25,700	NA	NA	NA	6,640	**40**	18,700,000	429,000	NA	NA	NA	NA	**85**	NA
MPS4L	2004	15,300,000	84,000	234	**30**	10,600	10,200	79	25,300,000	514,000	575	96,000	1,260,000	**3**	1,070	62,400
MPS4L	2005	14,000,000	65,300	178	80	14,500	10,100	**35**	22,900,000	433,000	493	23,000	527,000	81	**3,850**	57,200
MPS1AM	2005	12,200,000	14,800	91	23	9,100	7,900	110	16,400,000	345,000	131	500	71,000	17	**3,650**	41,800
MPS1M	2004	11,100,000	15,900	114	**31**	**1,545**	8,580	57	15,700,000	376,000	**155**	15,500	142,000	**3**	**499**	56,400
MPS1L	2004	12,700,000	21,900	136	**30**	**1,525**	8,380	41	17,600,000	405,000	**153**	34,300	302,000	**3**	**492**	50,300
MPS2M	2004	15,500,000	44,800	188	72	11,300	9,060	62	27,500,000	504,000	728	35,500	526,000	178	**482**	66,600
MPS2L	2004	18,100,000	107,000	**150**	135	8,740	11,400	70	29,800,000	486,000	787	71,200	803,000	**3**	1,160	69,900
MPS2L	2005	16,700,000	109,000	293	146	17,100	10,900	**35**	27,600,000	423,000	770	17,800	528,000	135	**3,850**	63,800
MPS2L	2008	16,400,000	101,000	NA	NA	NA	7,000	**45**	27,300,000	416,000	NA	NA	NA	NA	**4,750**	NA
MBBL	2004	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MBBL	2005	17,600,000	110,000	261	64	12,900	9,300	**35**	27,200,000	309,000	1,170	13,500	247,000	72	**3,950**	90,800
MBBL	2008	16,700,000	92,900	NA	NA	NA	6,560	**45**	23,800,000	416,000	NA	NA	NA	NA	**4,100**	NA
Subsurface Sediment																
MPS3L	2008	17,500,000	101,000	NA	NA	NA	7,430	**45**	26,300,000	392,000	NA	NA	NA	NA	**4,350**	NA
MBBL	2008	16,300,000	83,400	NA	NA	NA	6,800	**45**	23,000,000	318,000	NA	NA	NA	NA	5,450	NA
Comparison Values																
Alaskan Rock (high) [c]		78,100,000	NC	NC	NC	NC	NC	NC	66,600,000	1,710,000	NC	NC	NC	NC	NC	NC
Alaskan Rock (low) [c]		26,700,000	NC	NC	NC	NC	NC	NC	15,900,000	351,000	NC	NC	NC	NC	NC	NC
Avg Continental Crust [c]		79,600,000	NC	NC	NC	NC	NC	NC	43,200,000	716,000	NC	NC	NC	NC	NC	NC

Notes:

a. "Part Two constituents" are those inorganic constituents for which there are not SQuiRT values for comparison.

b. The letters"M" or "L" at the end of the station code indicate the tidal elevation where the sample was collected, i.e., middle or lower, respectively.

c. Source: Saupe et al., 2005.

Results are reported on a dry weight basis.

Concentrations measured below the limit of detection are indicated by **bold** text.

NA = analysis not performed. NC = no comparison value available

NH3-N = ammonia as nitrogen. TOC = total organic carbon.

TKN = total Kjeldahl nitrogen. µg/kg = micrograms per kilogram. (Data in analytical results tables in appendices are presented in milligrams per kilogram [mg/kg]; 1 mg/kg equals 1,000 µg/kg).

TABLE 35.4-8
Analytical Results for Subtidal Sediment: Part One Constituents[a], Grain Size, and Total Organic Carbon, 2004 and 2008

Station [b]	Year	Grain Size (% fines) [b]	TOC	Antimony (µg/kg)	Arsenic (µg/kg)	Cadmium (µg/kg)	Chromium (µg/kg)	Copper (µg/kg)	Lead (µg/kg)	Mercury (µg/kg)	Nickel (µg/kg)	Selenium (µg/kg)	Silver (µg/kg)	Zinc (µg/kg)
Surface Sediment														
MPS4 [c]	2004	81.0%	0.73%	138	10,800	**30**	31,800	28,000	5,380	41	22,300	473	92	65,200
MPS4 [c]	2008	49.9%	0.58%	100	6,540	46	16,100	14,700	5,480	26	12,000	400	54	36,300
MWGI	2004	NA	0.46%	148	9,670	71	20,000	24,700	3,690	34	16,400	668	98	55,000
MOPP1	2004	25.0%	0.24%	183	5,940	**30**	14,500	12,400	3,260	34	11,900	356	49	39,100
MOPP1 [c]	2008	28.8%	0.18%	70	6,210	31	12,000	9,810	4,790	22	10,600	**200**	35	30,400
MPS1 [c]	2004	65.0%	0.58%	164	8,870	74	26,900	31,400	5,470	44	23,500	864	113	68,900
MPS1 [c]	2008	85.4%	0.74%	160	8,000	72	22,700	20,300	7,200	46	17,500	600	86	47,200
MPS2 [c]	2004	68.0%	0.53%	168	9,700	72	27,600	30,500	5,370	41	23,500	638	120	68,800
Subsurface Sediment														
MPS1	2008	81.9%	0.64%	120	6,040	69	20,100	19,700	6,930	43	16,200	500	87	44,000
Comparison Values														
9 nm east of MOPP1 [d]		NC	NC	NC	NC	<250	NC	17,200	NC	NC	5,900	NC	NC	17,800
15 nm east of MOPP1 [d]		NC	NC	NC	NC	<250	NC	15,100	NC	NC	4,100	NC	NC	14,700
Chinitna Bay [e]		NC	NC	750	13,000	130	28,000	39,000	7,100	50	15,000	ND	150	82,000
Cook Inlet [e]		NC	NC	830	10,000	170	64,000	28,000	11,000	50	27,000	ND	140	79,000
Alaskan Rock (high) [e]		NC	NC	NC	39,000	NC	84,000	75,000	25,000	NC	47,000	NC	NC	288,000
Alaskan Rock (low) [e]		NC	NC	NC	8,000	NC	47,000	16,000	6,000	NC	19,000	NC	NC	96,000
Average Continental Crust [e]		NC	NC	300	1,700	100	126,000	25,000	14,800	40	56,000	NC	70	65,000
SQuiRT [f]		NC	NC	630	7,240	380	49,000	18,700	30,000	130	15,000	1,000	230	94,000

Notes:

a. "Part One constituents" are those inorganic constituents for which there are SQuiRT values for comparison.

b. Measured as percentage passing 75 microns in 2004 and 63 microns in 2008.

c. Values represent the median for five replicate samples taken at the respective sampling station.

d. Source: Burrell, 1978.

e. Source: Saupe et al., 2005; Chinitna Bay station approx. 18 nm northeast of MOPP1, Cook Inlet station approx. 30 nm south of MOPP1.

f. Source: Buchman, 2008.

Results are reported on a dry weight basis.

Concentrations measured below the limit of detection are indicated by **bold** text.

NA = analysis not performed. NC = no comparison value available

nm = nautical miles TOC = total organic carbon.

µg/kg = micrograms per kilogram. (Data in analytical results tables in appendices are presented in milligrams per kilogram [mg/kg]; 1 mg/kg equals 1,000 µg/kg.)

TABLE 35.4-9
Analytical Results for Subtidal Sediment: Part Two Constituents[a], 2004 and 2008

Station	Year	Aluminum (µg/kg)	Barium (µg/kg)	Beryllium (µg/kg)	Bismuth (µg/kg)	Boron (µg/kg)	Cobalt (µg/kg)	Cyanide (µg/kg)	Iron (µg/kg)	Manganese (µg/kg)	Molybdenum (µg/kg)	NH3-N (µg/kg)	TKN (µg/kg)	Thallium (µg/kg)	Tin (µg/kg)	Vanadium (µg/kg)
Surface Sediment																
MPS4 [b]	2004	15,600,000	87,400	201	98	11,500	11,200	70	27,400,000	540,000	694	71,500	814,000	**3**	1,050	69,600
MPS4 [b]	2008	18,700,000	79,000	NA	NA	NA	7,470	**40**	24,700,000	434,000	NA	NA	NA	NA	490	NA
MWGI	2004	12,800,000	65,500	227	76	9,550	10,200	140	21,600,000	438,000	778	51,100	761,000	192	**495**	58,300
MOPP1	2004	12,500,000	64,000	163	**30**	10,500	6,990	78	23,700,000	325,000	**151**	23,000	315,000	37	**487**	63,200
MOPP1 [b]	2008	11,700,000	62,000	NA	NA	NA	6,620	**45**	21,600,000	337,000	NA	NA	NA	NA	**5,450**	NA
MPS1 [b]	2004	16,000,000	106,000	276	79	13,100	11,000	120	27,200,000	435,000	775	53,600	640,000	95	1,050	66,700
MPS1 [b]	2008	19,800,000	114,000	NA	NA	NA	8,260	**40**	29,100,000	453,000	NA	NA	NA	NA	600	NA
MPS2 [b]	2004	13,400,000	112,000	272	67	9,020	10,900	110	22,600,000	453,000	606	58,600	734,000	79	1,040	65,900
Subsurface Sediment																
MPS1	2008	20,200,000	108,000	NA	NA	NA	7,840	40	28,700,000	422,000	NA	NA	NA	NA	590	NA
Comparison Values																
9 nm east of MOPP1 [c]		NC	NC	NC	NC	NC	NC	NC	3,685,000	112,000	NC	NC	NC	NC	NC	NC
15 nm east of MOPP1 [c]		NC	NC	NC	NC	NC	NC	NC	3,310,000	100,000	NC	NC	NC	NC	NC	NC
Chinitna Bay [d]		28,000,000	NC	NC	NC	NC	NC	NC	53,000,000	830,000	NC	NC	NC	NC	510	NC
Cook Inlet [d]		43,000,000	NC	NC	NC	NC	NC	NC	35,000,000	700,000	NC	NC	NC	NC	610	NC
Alaskan Rock (high) [d]		78,100,000	NC	NC	NC	NC	NC	NC	66,600,000	1,710,000	NC	NC	NC	NC	NC	NC
Alaskan Rock (low) [d]		26,700,000	NC	NC	NC	NC	NC	NC	15,900,000	351,000	NC	NC	NC	NC	NC	NC
Average Continental Crust [d]		79,600,000	NC	NC	NC	NC	NC	NC	43,200,000	716,000	NC	NC	NC	NC	NC	NC

Notes:

a. "Part Two constituents" are those inorganic constituents for which there are not SQuiRT values for comparison.

b. Values represent the median for five replicate samples taken at the respective sampling station.

c. Source: Burrell, 1978.

d. Source: Saupe et al., 2005; Chinitna Bay station approx. 18 nm northeast of MOPP1, Cook Inlet station approx. 30 nm south of MOPP1.

Results are reported on a dry weight basis.

Concentrations measured below the limit of detection are indicated by **bold** text.

NA = analysis not performed.
NC = no comparison value available.
NH3-N = total ammonia as nitrogen.
nm = nautical miles.
TKN = total Kjeldahl nitrogen.
TOC = total organic carbon.
µg/kg = micrograms per kilogram. (Data in analytical results tables in appendices are presented in milligrams per kilogram [mg/kg]; 1 mg/kg equals 1,000 µg/kg.)

TABLE 35.4-10
Analytical Results for Marine Sediments: Acid Volatile Sulfide and Simultaneously Extractable Metals, 2008

Station	Bioavailability	Acid-Volatile Sulfide (µmol/kg)	Sum of SEM Values (µmol/kg)	Cadmium-SEM (µmol/kg)	Copper-SEM (µmol/kg)	Lead-SEM (µmol/kg)	Mercury-SEM (µmol/kg)	Nickel-SEM (µmol/kg)	Zinc-SEM (µmol/kg)
Intertidal Sediment [a]									
MPS3L		3,711	1,788	**0.89**	456	**39**	**0.05**	324	968
MPSEM	Yes	75	1,682	**4.00**	453	38	**0.05**	302	885
MBSA1M	Yes	53	1,026	**3.56**	408	**10**	**0.05**	121	483
MPS4M	Yes	**3**	178	**8.45**	60	**23**	**0.10**	**16**	70
MPS2L	Yes	390	1,584	**0.89**	357	34	**0.04**	308	884
MBBL	Yes	549	1,139	**0.89**	252	29	**0.04**	199	658
Intertidal Subsurface Sediment [a]									
MPS3L		20,458	1,912	**0.89**	452	41	**0.05**	353	1,066
MBBL		2,492	1,112	**0.89**	236	26	**0.04**	160	690
Subtidal Sediment [b]									
MPS4	Yes	549	1,162	**3.11**	261	28	**0.02**	210	667
MOPP1	Yes	**3** [c]	831	**0.89**	145	25	**0.04**	165	495
MPS1	Yes	187	1,781	**3.56**	398	39	**0.05**	365	989
Subtidal Subsurface Sediment									
MPS1		4,834	1,733	**3.11**	403	37	**0.02**	324	967

Notes:

a. The letters"M" or "L" at the end of the station code indicate the tidal elevation where the sample was collected, i.e., middle or lower, respectively.
b. Values for subtidal surface sediments represent the median for five replicate samples taken at the respective sampling station.
c. AVS was not detected above the method detection limit in three of the five replicate samples collected at MOPP1.

Results are reported on a dry weight basis.
Concentrations measured below the limit of detection are indicated by **bold** text.
µmol/kg = micromoles per kilogram. (Analytical results in Appendix 35.4A1 are presented in milligrams per kilogram [mg/kg];
µmol/kg = mg/kg / atomic weight of the element for SEMs or of sulfide for AVS. These atomic weights are provided in Appendix 35.4A4.)
SEM = Simultaneously extracted metal.

TABLE 35.4-11
Analytical Results for Marine Sediment: Organic Compounds, 2004

Station	Benzene (µg/kg)	Ethylbenzene (µg/kg)	Toluene (µg/kg)	Xylene, Isomer o (µg/kg)	Xylene, Isomers m & p (µg/kg)	Gasoline-range Organics (µg/kg)	Diesel-range Organics (µg/kg)	Residual-range Organics (µg/kg)
Intertidal Sediment [a]								
MPS3M	**0.60**	**1.19**	**2.29**	**1.19**	**2.29**	314	**9,300**	32,200
MPS3L	**0.71**	**1.41**	**2.71**	**1.41**	**2.71**	502	43,400	142,000
MPSEM	**1.92**	**3.69**	**7.35**	**3.69**	**7.35**	210	41,700	45,900
MPS4M	**0.58**	**1.17**	**2.24**	**1.17**	**2.24**	**595**	**10,050**	33,000
MPS4L	**0.67**	**1.33**	**2.55**	**1.33**	**2.55**	384	27,800	58,500
MPS1M	**0.52**	**1.03**	**1.99**	**1.03**	**1.99**	**430**	**9,900**	**9,900**
MPS1L	**0.51**	**1.03**	**1.97**	**1.03**	**1.97**	215	**8,950**	**8,950**
MPS2M	**0.55**	**1.10**	**2.11**	**1.10**	**2.11**	**352**	**14,000**	**14,000**
MPS2L	**0.73**	**1.46**	**2.80**	**1.46**	**2.80**	**640**	**9,100**	**9,100**
Subtidal Sediment								
MPS4 [b]	**0.66**	**1.32**	**2.53**	**1.32**	**2.53**	**600**	**12,350**	29,700[c]
MOPP1	**0.54**	**1.07**	**2.06**	**1.07**	**2.06**	258	**9,300**	9,300
MPS1 [b]	**0.66**	**1.32**	**2.53**	**1.32**	**2.53**	620[c]	**10,050**	33,900
MPS2 [b]	**0.71**	**1.42**	**2.73**	**1.42**	**2.73**	655[d]	11,600[e]	30,900
Comparison Values								
SQuiRT [f]	NC	4	NC	4	4	NC	NC	NC

Notes:

a. The letters "M" or "L" at the end of the station code indicate the tidal elevation where the sample was collected, i.e., middle or lower, respectively.

b. Values represent the median for five replicate samples taken at the respective sampling station.

c. Analyte was not detected above the detection limit in three of the five replicate samples collected at this station.

d. Analyte was not detected above the detection limit in four of the five replicate samples collected at this station.

e. Analyte was not detected above the detection limit in two of the five replicate samples collected at this station.

f. Source: Buchman, 2008.

Results are reported on a dry weight basis.

Concentrations measured below the limit of detection are indicated by **bold** text.

NC = no comparison value available

µg/kg = micrograms per kilogram. (Analytical results in Appendix 35.4A2 are presented in milligrams per kilogram [mg/kg]; 1 mg/kg equals 1,000 µg/kg).

TABLE 35.4-12
Analytical Results for Interidal Sediment: Organic Compounds, 2005

Station [a]	Benzene (µg/kg)	Ethyl-benzene (µg/kg)	Toluene (µg/kg)	Xylene, Isomer o (µg/kg)	Xylene, Isomers m & p (µg/kg)	Gasoline-range Organics (µg/kg)	Diesel-range Organics (µg/kg)	Residual-range Organics (µg/kg)
MPS3M	**10.5**	**9.5**	**9.5**	**8**	**18**	**700**	**36,000**	**60,000**
MPSEM	**8.5**	**8**	**8**	**6.5**	**15**	**700**	**23,000**	**60,000**
MBSA1M	**6.5**	**6**	**6**	**4.75**	**11.5**	**475**	**1,700**	**46,500**
MPS4L	**8.5**	**7.5**	**7.5**	**6.5**	**14.5**	**600**	**37,000**	**60,000**
MPS1AM	**7**	**6.5**	**6.5**	**4.95**	**12**	**490**	**1,800**	**48,000**
MPS2L	**8.5**	**8**	**8**	**6.5**	**14.5**	**6,500**	**24,000**	**60,000**
MBBL	**7.5**	**7**	**7**	**5.5**	**13**	**550**	**6,600**	**48,500**
Comparison Values								
SQuiRT [b]	NC	4	NC	4	4	NC	NC	NC

Station [a]	2-Methyl-naphthalene (µg/kg)	Acenaph-thene (µg/kg)	Acenaph-thylene (µg/kg)	Anthra-cene (µg/kg)	Benzo(a)-anthracene (µg/kg)	Benzo(a)-pyrene (µg/kg)	Benzo(b)-fluoran-thene (µg/kg)	Benzo-(g,h,i)-perylene (µg/kg)	Benzo(k)-fluoran-thene (µg/kg)	Chrysene (µg/kg)
MPS3M	2.6	**0.14**	**0.19**	**0.19**	**0.14**	**0.19**	**0.41**	**0.2**	**0.285**	**0.35**
MPSEM	2.3	**0.13**	**0.18**	**0.18**	0.29	**0.18**	**0.39**	0.39	**0.265**	0.7
MBSA1M	0.45	**0.1**	**0.135**	**0.135**	**0.1**	**0.135**	**0.29**	**0.14**	**0.2**	**0.25**
MPS4L	1.5	**0.125**	**0.17**	**0.17**	**0.125**	**0.17**	**0.37**	**0.18**	**0.255**	**0.315**
MPS1AM	**0.215**	**0.105**	**0.14**	**0.14**	**0.105**	**0.14**	**0.305**	**0.145**	**0.21**	**0.26**
MPS2L	2.5	**0.125**	**0.17**	**0.17**	0.29	**0.17**	0.88	0.59	**0.255**	0.94
MBBL	1.4	**0.11**	**0.155**	**0.155**	**0.11**	**0.155**	**0.33**	**0.16**	**0.23**	**0.28**
Comparison Values										
SQuiRT [b]	NC	6.7	5.9	34	61	69	130	67	70	82

Station [a]	Dibenzo(a,h)-anthracene (µg/kg)	Dibenzo-furan (µg/kg)	Fluoran-thene (µg/kg)	Fluorene (µg/kg)	Indeno-(1,2,3-cd)-pyrene (µg/kg)	Naph-thalene (µg/kg)	Phenan-threne (µg/kg)	Pyrene (µg/kg)
MPS3M	**0.225**	0.75	0.6	0.43	**0.205**	**2.15**	2.4	0.65
MPSEM	**0.21**	0.69	0.68	0.47	**0.195**	**2.05**	2.1	0.95
MBSA1M	**0.16**	**0.105**	**0.21**	**0.115**	**0.145**	**1.55**	0.46	**0.22**
MPS4L	**0.2**	0.45	**0.26**	**0.15**	**0.185**	**1.95**	1.5	**0.28**
MPS1AM	**0.165**	**0.11**	**0.215**	**0.12**	**0.155**	**1.6**	**0.21**	**0.23**
MPS2L	**0.205**	0.79	0.87	0.49	**0.185**	**1.95**	3.4	0.83
MBBL	**0.18**	0.4	**0.235**	**0.13**	**0.165**	**1.75**	1.3	**0.25**
Comparison Values								
SQuiRT [b]	6.2	NC	113	19	68	30	68	125

Notes:

a. The letters"M" or "L" at the end of the station code indicate the tidal elevation where the sample was collected, i.e., middle or lower, respectively.

b. Source: Buchman, 2008.

Results are reported on a dry weight basis.

Concentrations measured below the limit of detection are indicated by **bold** text.

NC = no comparison value available

µg/kg = micrograms per kilogram. (Some analytical results in Appendix 35.4A2 are presented in milligrams per kilogram [mg/kg]; 1 mg/kg equals 1,000 µg/kg.)

TABLE 35.4-13
Analytical Results for Rockweed, Inorganic Constituents, 2008

Station	Antimony (µg/kg)	Arsenic (µg/kg)	Boron (µg/kg)	Cadmium (µg/kg)	Chromium (µg/kg)	Copper (µg/kg)	Lead (µg/kg)	Mercury (µg/kg)	Molybdenum (µg/kg)	Nickel (µg/kg)	Silver (µg/kg)	Thallium (µg/kg)	Zinc (µg/kg)
May													
MPS4	70	36500	89400	2320	700	9140	200	15	220	8990	181	9	18900
MPS1B	50	33000	113000	1960	500	10300	150	50	230	7260	227	8	16000
July													
MPS3	60	19400	118000	1340	1800	6380	180	9	190	6690	80	7	8190
MPS4	80	22700	126000	1830	3800	6270	190	12	220	8300	127	9	9100
MPS1B	50	21000	130000	1280	2400	4180	270	19	230	5080	92	13	7770
MPS2	60	36400	98400	2060	2400	6510	330	20	270	6580	130	11	10100
September													
MPS4	70	36500	134000	1800	2000	6720	560	11	320	5990	150	15	10600
MPS1B	70	26900	94000	1700	900	5830	300	7	370	6690	150	24	10700
Median	65	29950	115500	1815	1900	6445	235	13	230	6690	140	10	10350
Comparison Values													
Eisler [a]	NC	8600	NC	6000	3500	NC	600	NC	NC	15000	NC	NC	45000

Note:

a. Source: Eisler, n.d.; concentrations for cadmium, chromium, and nickel in *F. vesiculosus*, other elements in *F. distichus*.

Results are reported on a dry weight basis.

NC = no comparison value available.

µg/kg = micrograms per kilogram. (Analytical results in Appendix 35.4B are presented in milligrams per kilogram [mg/kg]; 1 mg/kg equals 1,000 µg/kg.)

TABLE 35.4-14

Concentrations of Inorganic Constituents in Fish and Invertebrate Tissues, 2004 and 2005

Station	Bay	Year	Species	Antimony (µg/kg)	Arsenic (µg/kg)	Beryllium (µg/kg)	Cadmium (µg/kg)	Chromium (µg/kg)	Copper (µg/kg)	Lead (µg/kg)	Mercury (µg/kg)	Molybdenum (µg/kg)	Nickel (µg/kg)	Selenium (µg/kg)	Silver (µg/kg)	Thallium (µg/kg)	Zinc (µg/kg)
Invertebrates [a]																	
MPS2Cr	Iniskin	2004	Lyre Crab	41	18,000	NA	5,350	NA	119,000	534	114	NA	3,780	3,100	1,610	NA	NA
MPS11dx	Iniskin	2004	Helmet Crab	40	32,500	NA	7,920	NA	127,000	928	279	NA	3,430	3,500	1,400	NA	NA
MPS2Cr	Iniskin	2004	Helmet Crab	15	9,490	NA	3,870	NA	123,000	95	43	NA	1,670	2,300	961	NA	NA
MPS11dx	Iniskin	2004	Oregon Triton	85	103,000	NA	23,500	NA	589,000	1,920	572	NA	4,300	4,300	6,890	NA	NA
MPS11dx	Iniskin	2004	Lyre Whelk	48	13,800	NA	4,550	NA	54,300	493	211	NA	1,830	2,200	1,150	NA	NA
MPS3	Iliamna	2004	Cockle	23	6,700	NA	168	NA	6,560	622	76	NA	11,100	2,100	59	NA	NA
MPS1Bdx	Iniskin	2004	Cockle	27	6,440	NA	169	NA	14,900	1,420	24	NA	8,820	2,700	37	NA	NA
MPS4L	Iliamna	2004	Oblique Macoma	83	17,000	NA	187	NA	35,900	2,730	126	NA	10,500	3,600	250	NA	NA
MPS1Bdx	Iniskin	2004	Surf Clam	25	5,090	NA	402	NA	15,300	593	32	NA	5,540	2,000	160	NA	NA
MPS1	Iniskin	2004	Horse Mussel	13	8,720	NA	2,490	NA	67,700	1,500	117	NA	6,510	2,600	770	NA	NA
MPSE	Iliamna	2004	Eastern Softshell Clam	83	47,700	NA	285	NA	19,200	2,550	42	NA	8,530	2,900	127	NA	NA
MPS3	Iliamna	2004	Mussel	20	8,020	NA	2,110	NA	9,660	685	64	NA	3,480	2,600	47	NA	NA
MPS4M	Iliamna	2004	Mussel	14	7,670	NA	2,200	NA	7,440	478	83	NA	2,560	3,000	47	NA	NA
MPS1M	Iniskin	2004	Mussel	19	8,980	NA	2,990	NA	11,300	493	80	NA	3,810	4,000	47	NA	NA
MPS2M	Iniskin	2004	Mussel	19	8,630	NA	2,300	NA	12,700	636	67	NA	3,850	3,400	40	NA	NA
Fish																	
MPS3	Iliamna	2004	Chum Salmon-liver	8	1,560	NA	4,250	NA	273,000	115	89	NA	100	9,900	5,850	NA	NA
MPS3	Iliamna	2004	Chum Salmon-muscle	**3**	690	NA	10	NA	3,540	7	108	NA	410	1,400	**2**	NA	NA
MBS4	Iliamna	2005	Dolly Varden	**4**	810	**1.5**	12	**150**	4,800	20	151	**25**	2,770	600	**10**	5	61,700
MPS1C	Iniskin	2005	Dolly Varden	**4**	3,560	**1.5**	38	4,200	12,400	530	53	70	8,330	2,000	45	**10**	57,500
MPSE	Iliamna	2005	Starry Flounder	**4**	6,080	3.0	11	**150**	3,300	50	70	**25**	1,190	600	**10**	4	56,500
MBS3	Iliamna	2005	Starry Flounder	8	2,170	4.0	113	800	12,400	7,340	22	80	3,900	2,600	44	12	81,600
MBS3	Iliamna	2005	Starry Flounder	**4**	2,870	**1.5**	6	**150**	2,600	30	98	**25**	1,400	300	**10**	**1**	64,400
MBSA1	Iliamna	2005	Starry Flounder	**4**	10,900	**1.5**	9	**150**	2,600	30	84	**25**	1,230	1,100	**10**	2	83,300
MPS2TA	Iniskin	2005	Yellowfin Sole	**4**	3,810	**1.5**	112	1,400	8,600	100	47	60	4,360	1,670	968	**1**	45,600
MTR3	Iliamna	2005	White Spot Greenling	**4**	2,790	**1.5**	15	**150**	3,000	30	44	**25**	720	**700**	**10**	2	40,800
MTR1	Iliamna	2005	White Spot Greenling	49	6,140	**1.5**	72	2,000	18,700	170	**252**	70	7,210	1,400	66	2	55,500
MPS4	Iliamna	2005	White Spot Greenling	**4**	4,550	**1.5**	33	1,600	9,800	90	66	60	5,190	2,140	177	**1**	55,800
MPS1	Iniskin	2004	White Spot Greenling	**3**	4,670	NA	76	NA	4,970	54	140	NA	850	2,100	102	NA	NA
MBSA1	Iliamna	2005	Pacific Staghorn Sculpin	**4**	4,040	**1.5**	14	**150**	6,100	60	76	**25**	1,260	900	**10**	5	34,200
MPS1T	Iniskin	2004	Pacific Staghorn Sculpin	7	3,360	NA	23	NA	11,300	152	51	NA	2,800	1,800	28	NA	NA
MPS2H	Iniskin	2004	Pacific Staghorn Sculpin	9	7,340	NA	60	NA	6,220	125	130	NA	1,160	2,200	26	NA	NA

Notes:

a. The letters "M" or "L" at the end of the station code indicate the tidal elevation where the sample was collected, i.e., middle or lower tidal elevation, respectively.

Rows are sorted by species and then by bay.

Results are reported on a dry weight basis.

Concentrations measured below the limit of detection are indicated by **bold** text.

NA = analysis not performed.

µg/kg = micrograms per kilogram. (Analytical results in Appendix 35.4C1 are presented in milligrams per kilogram [mg/kg]; 1 mg/kg equals 1,000 µg/kg.)

TABLE 35.4-15
Median Concentrations of Inorganic Constituents in Fish and Invertebrate Tissues, 2008

Area [a]	Taxon	n	Antimony (µg/kg)	Arsenic (µg/kg)	Beryllium (µg/kg)	Boron (µg/kg)	Cadmium (µg/kg)	Chromium (µg/kg)	Copper (µg/kg)	Lead (µg/kg)	Mercury (µg/kg)	Molybdenum (µg/kg)	Nickel (µg/kg)	Selenium (µg/kg)	Silver (µg/kg)	Thallium (µg/kg)	Tin (µg/kg)	Zinc (µg/kg)
Y-Valley	Pink Salmon	1	25	1490	**4**	569	9	230	2170	17	136	17	170	500	**10**	4	60	12600
Iliamna	Chum Salmon	3	**4**	820	**4**	312	5	**35**	1740	25	133	**4**	20	**490**	**4**	**2**	**25**	12800
Y-Valley	Chum Salmon	1	**4**	860	**4**	398	6	**35**	1520	**2**	175	**4**	40	800	**10**	**2**	**25**	12600
Iliamna	Dolly Varden (adult)	1	**5**	3800	**3**	300	**2**	**30**	3150	67	118	11	210	1570	**3**	3	100	44400
Y-Valley	Dolly Varden (adult)	6	**4**	4505	**4**	300	**3**	75	4205	106	92	9	240	1935	**4**	**2**	350	48300
Iliamna	Pacific Halibut	8	**4**	6290	**4**	**150**	**3**	**35**	1640	48	309	15	330	2890	**4**	**2**	150	16550
Iniskin	Pacific Halibut	6	**5**	7190	**4**	**150**	**3**	58	1445	61	384	11	80	2525	**4**	**2**	**100**	15100
Iliamna	Dolly Varden (juvenile)	8	**4**	2835	**3**	1545	62	450	9650	71	73	67	1385	1000	40	7	180	121500
Iniskin	Dolly Varden (juvenile)	8	6	2285	**4**	2405	73	305	12350	87	70	73	1220	1050	48	6	145	128500
Iliamna	Starry Flounder	8	18	4305	**4**	2750	31	2825	12250	663	68	85	5245	600	19	6	435	74800
Iniskin	Yellowfin Sole	5	**4**	11400	**4**	2000	64	1030	4700	130	79	73	3010	1400	8	**2**	230	61100
Iliamna	Mussel	4 [b]	24	9475	17	28200	2550	3703	17050	706	91	446	7588	2350	50	16	265	62400
Iniskin	Mussel	4 [b]	25	9310	25	34050	2723	3753	9595	723	83	506	3338	2350	47	21	130	56850
Comparison Values																		
Alaska [c]	Pink Salmon		NC	1300	NC	NC	<50	<260	NC	<250	<130	NC	<250	1100	NC	NC	NC	NC
Alaska [c]	Chum Salmon		NC	1000	NC	NC	<50	<260	NC	<250	210	NC	<250	1300	NC	NC	NC	NC
Alaska [c]	Pacific Halibut		NC	6000	NC	NC	<50	<260	NC	<250	1100	NC	130	1700	NC	NC	NC	NC
Cook Inlet [d]	Flathead Sole (high)		NC	NC	NC	NC	<130	NC	NC	1160	NC	NC	<250	NC	NC	NC	NC	25700
Cook Inlet [d]	Flathead Sole (low)		NC	NC	NC	NC	<130	NC	NC	920	NC	NC	<250	NC	NC	NC	NC	24300
Oil Bay [e]	Mussel (high)		NC	NC	NC	NC	1000	NC	8000	NC	NC	NC	2400	NC	NC	NC	NC	70000
Oil Bay [e]	Mussel (low)		NC	NC	NC	NC	1000	NC	8000	NC	NC	NC	1200	NC	NC	NC	NC	56000
English Bay [f]	Mussel		NC	9210	NC	NC	3670	1090	6910	336	53	NC	1670	3060	43	NC	0	83700

Notes:

a. Iliamna = Iliamna Bay, Y-Valley = Y-Valley area between Iliamna and Iniskin Bays (comprising stations MYVCM and MYVL), Iniskin = Iniskin Bay. (See Figure 35.4-2.)

b. At MPS1B in Iniskin Bay and MPS4 in Iliamna Bay, replicate mussel samples were collected in May 2008. The analytical results for each sample pair were averaged and those average values were used when determining the median values presented here.

c. Source: ADEC, 2007. Values based on fish samples from throughout the state. Concentrations were originally expressed in wet weight, so they were multiplied by a factor of 5 for use in this table.

d. Source: Burrell, 1978; sampling location was approximately 45 nautical miles east of the Iniskin/Iliamna Estuary.

e. Source: Burrell, 1978; sampling location was approximately 6 nautical miles east-northeast of station MOPP1.

f. Source: NOAA Mussel Watch program for English Bay, located approximately 50 nautical miles east-southeast of the Iniskin/Iliamna Estuary. (NOAA, 2011)

Results are reported on a dry weight basis.

Concentrations measured below the limit of detection are indicated by **bold** text.

n = number of samples.

NA = analysis not performed.

NC = no comparison value available.

µg/kg = micrograms per kilogram. (Analytical results in Appendix 35.4C1 are presented in milligrams per kilogram [mg/kg]; 1 mg/kg equals 1,000 µg/kg.)

TABLE 35.4-16
Analytical Results for Mussel Tissue, Organic Constituents, 2008

Month	Station	Lipids (%)	Total AHCs (µg/kg)	Total PAHs without Perylene (µg/kg)
May	MPS4 [a]	4.5	7,479	198
May	MPS1B [a]	4.7	10,325	233
Jul	MPS3	5.3	13,684	116
Jul	MPS4	9.1	17,231	109
Jul	MPS1B	4.1	27,943	45
Jul	MPS2	5.8	25,691	135
Sep	MPS4	5.2	14,392	99
Sep	MPS1B	1[(b)]	25,918	43

Notes:

a. Values represent the median for multiple replicate samples taken at the respective sampling station.

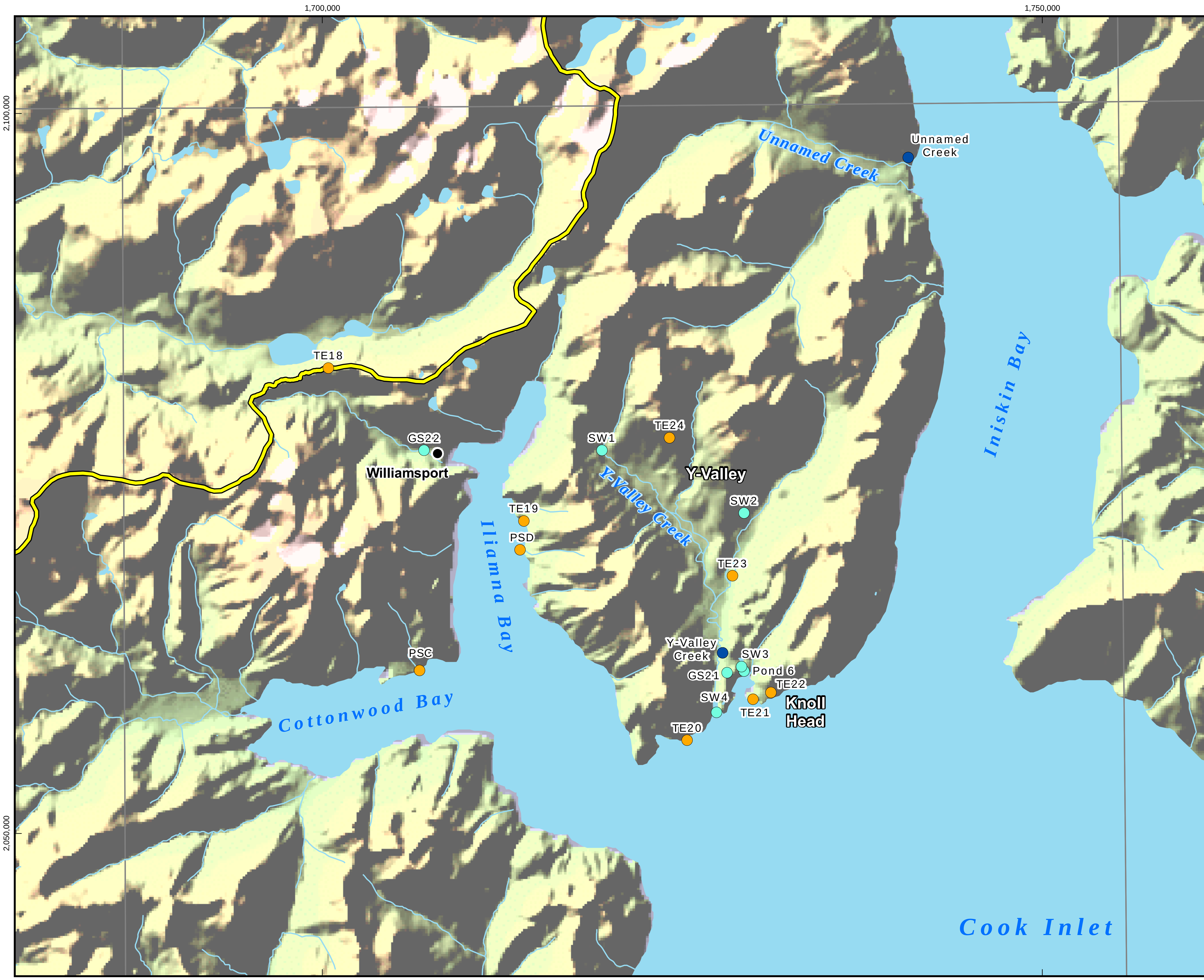
b. This value does not match the other values for lipids in format as reported from the laborator

AHCs = aliphatic hydrocarbons.

PAHs = polynuclear aromatic hydrocarbons.

µg/kg = micrograms per kilogram. (Analytical results in Appendix 35.4C2 for AHCs [total alkanes] are presented in µg/gram [g]; 1 µg/g equals 1,000 µg/kg.)

FIGURES

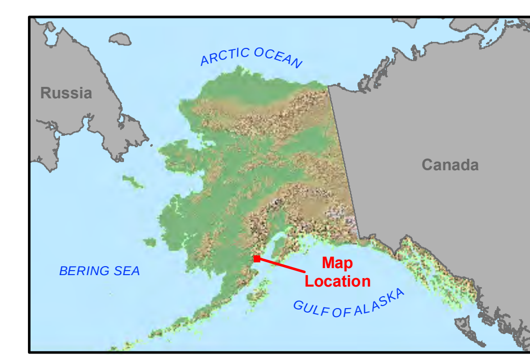


THE pebble PARTNERSHIP

Figure 35.1-1
Trace Elements Study,
Sampling Locations for Soil, Vegetation,
Sediment, and Fish,
Cook Inlet Drainages Study Area,
2004-2008

Legend

- Soil and Vegetation Collection Locations
- Stream Sediment Collection Locations
- Fish Collection Locations
- Communities
- Bristol Bay/Cook Inlet Drainages Boundary



Miles 0 1 2 3

Kilometers 0 1 2 3 4

N

Scale 1:80,000

Alaska State Plane Zone 5 (units feet)
1983 North American Datum

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Version: 6	Author: RDI-LS

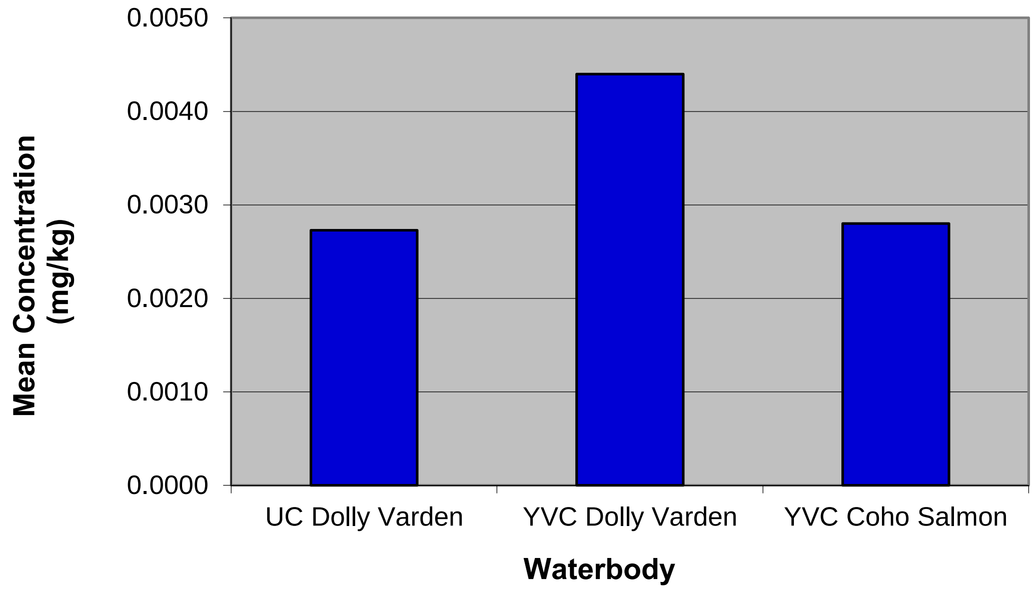

FIGURE 35.3-1
Mean Antimony Concentrations in Whole Fish, Unnamed Creek (UC) and Y-Valley Creek (YVC), 2004 and 2005

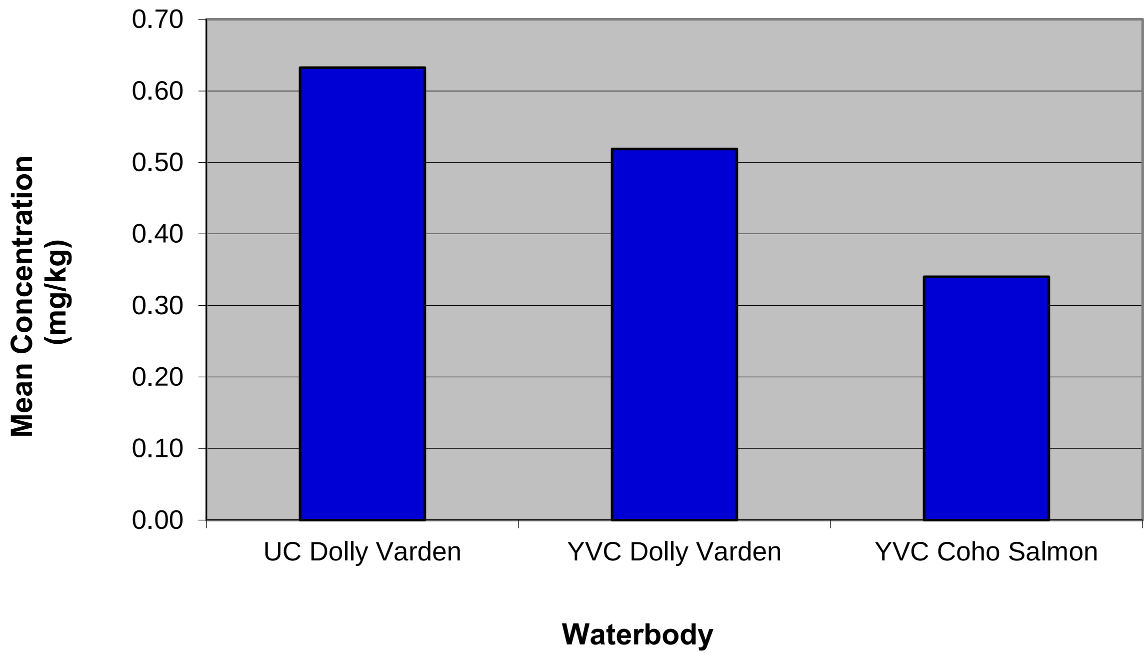

FIGURE 35.3-2
Mean Arsenic Concentrations in Whole Fish, Unnamed Creek (UC) and Y-Valley Creek (YVC), 2004 and 2005

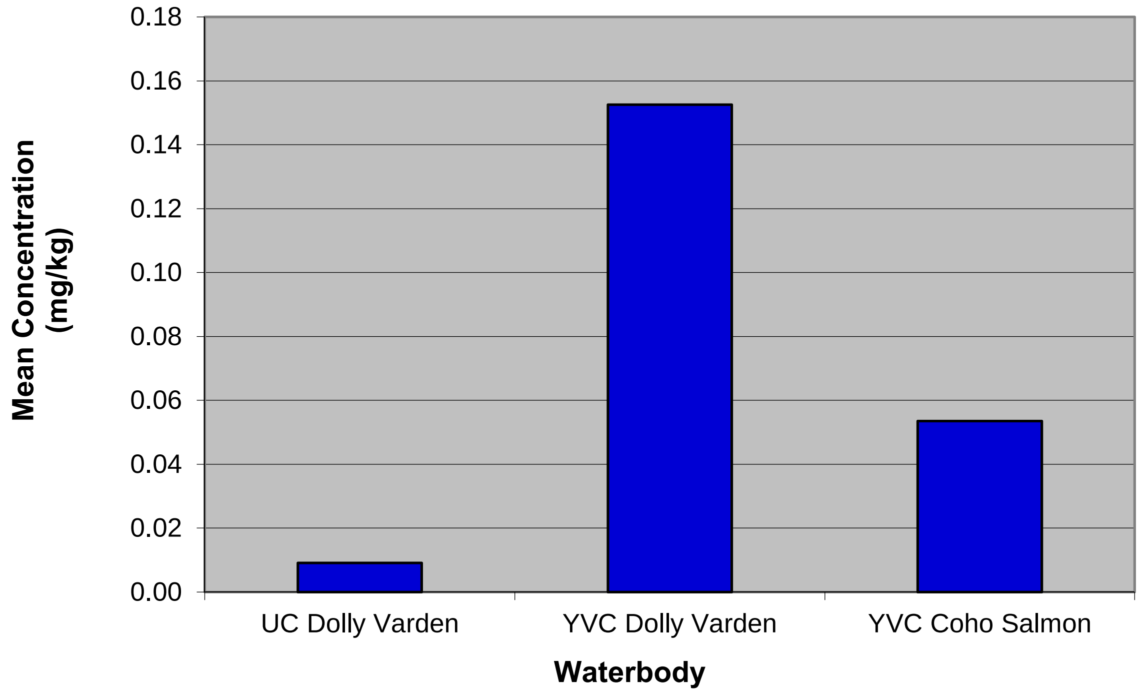

FIGURE 35.3-3
Mean Cadmium Concentrations in Whole Fish, Unnamed Creek (UC) and Y-Valley Creek (YVC), 2004 and 2005

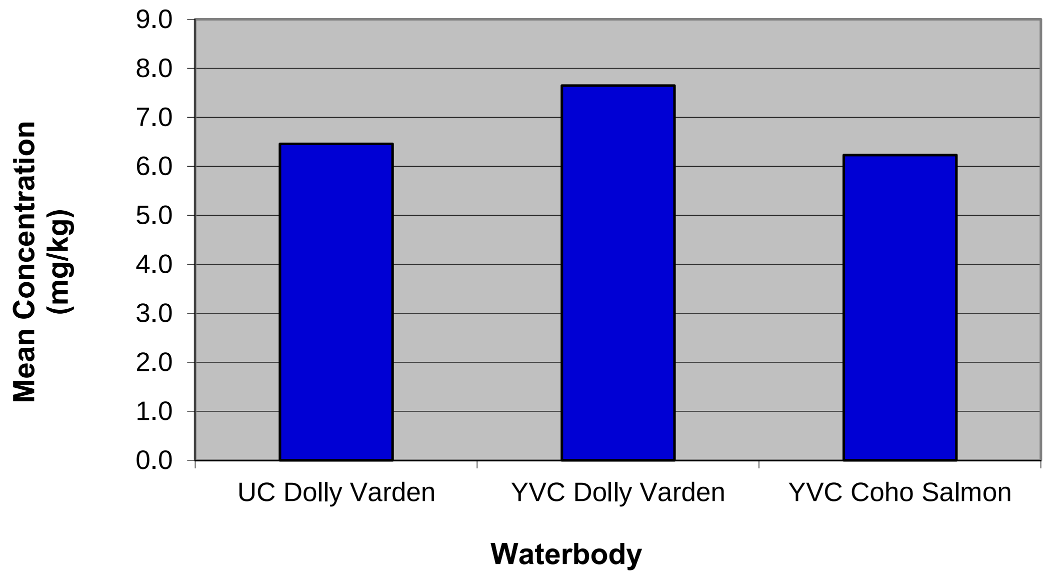

FIGURE 35.2-4
Mean Copper Concentrations in Whole Fish, Unnamed Creek (UC) and Y-Valley Creek (YVC), 2004 and 2005

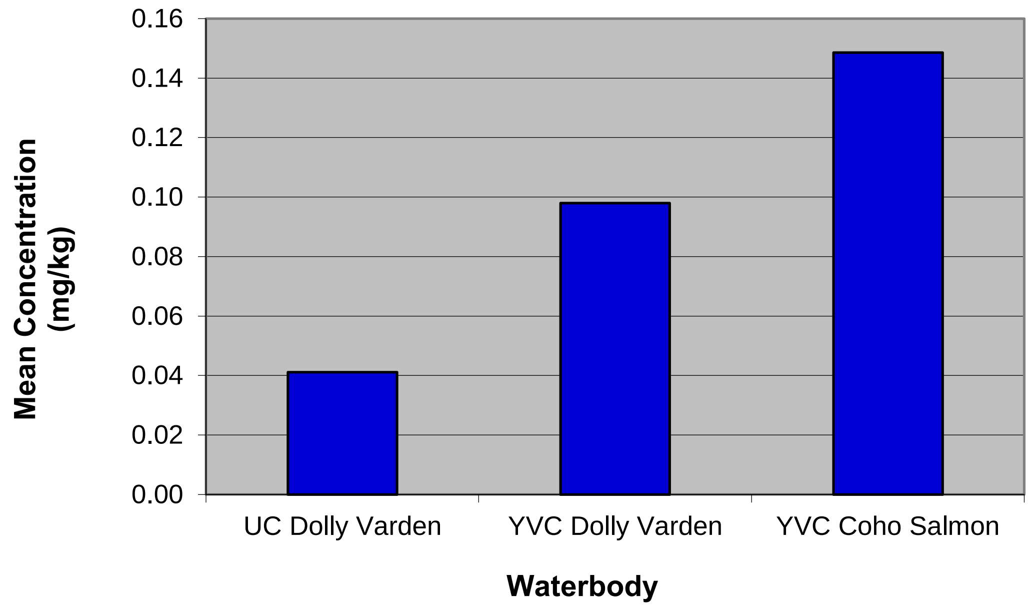

FIGURE 35.3-5
Mean Lead Concentrations in Whole Fish, Unnamed Creek (UC) and Y-Valley Creek (YVC), 2004 and 2005

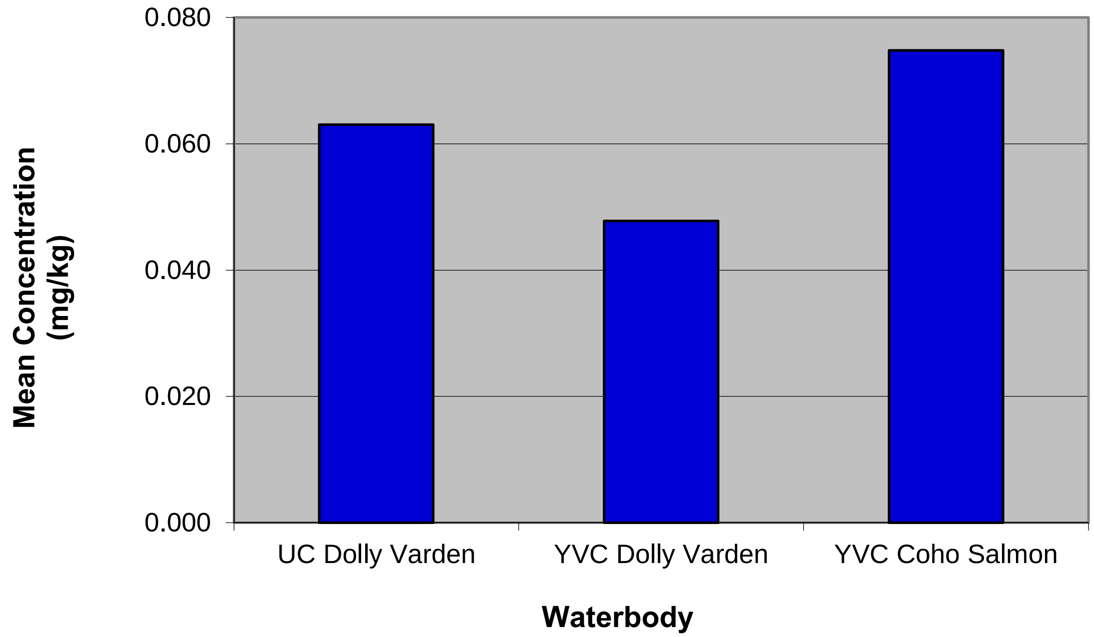

FIGURE 35.3-6
Mean Mercury Concentrations in Whole Fish, Unnamed Creek (UC) and Y-Valley Creek (YVC), 2004 and 2005

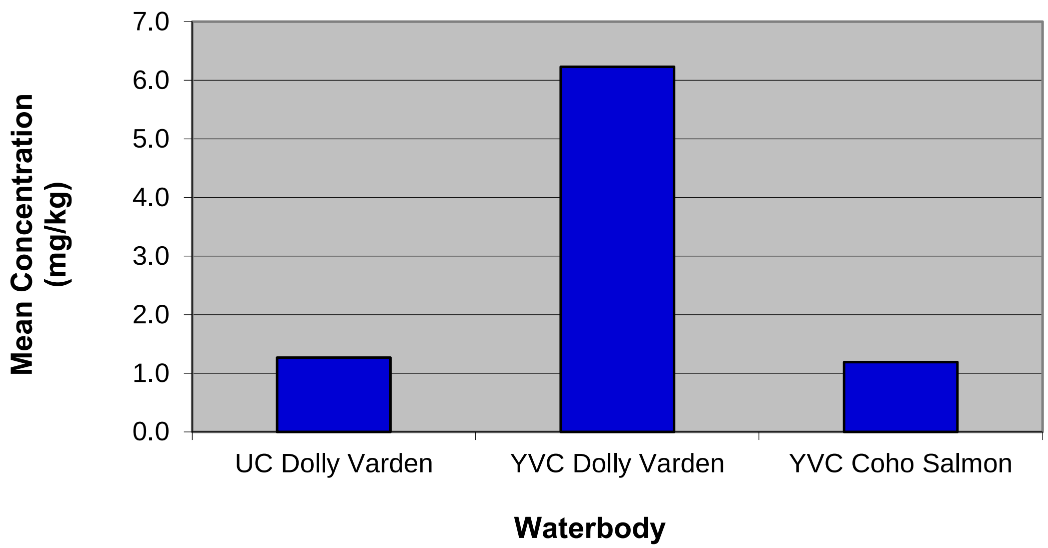

FIGURE 35.3-7
Mean Nickel Concentrations in Whole Fish, Unnamed Creek (UC) and Y-Valley Creek (YVC), 2004 and 2005

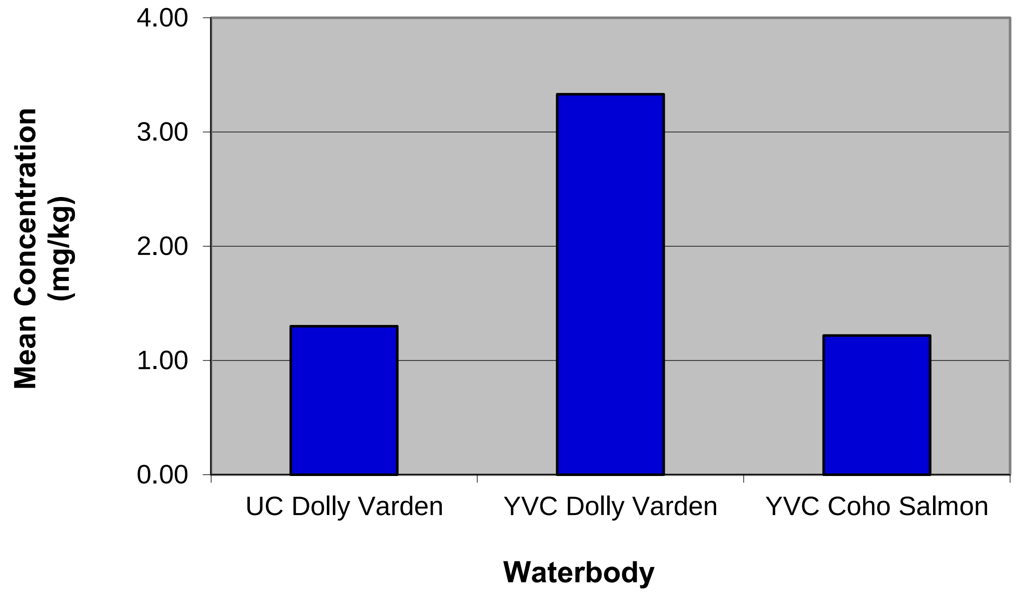

FIGURE 35.3-8
Mean Selenium Concentrations in Whole Fish, Unnamed Creek (UC) and Y-Valley Creek (YVC), 2004 and 2005

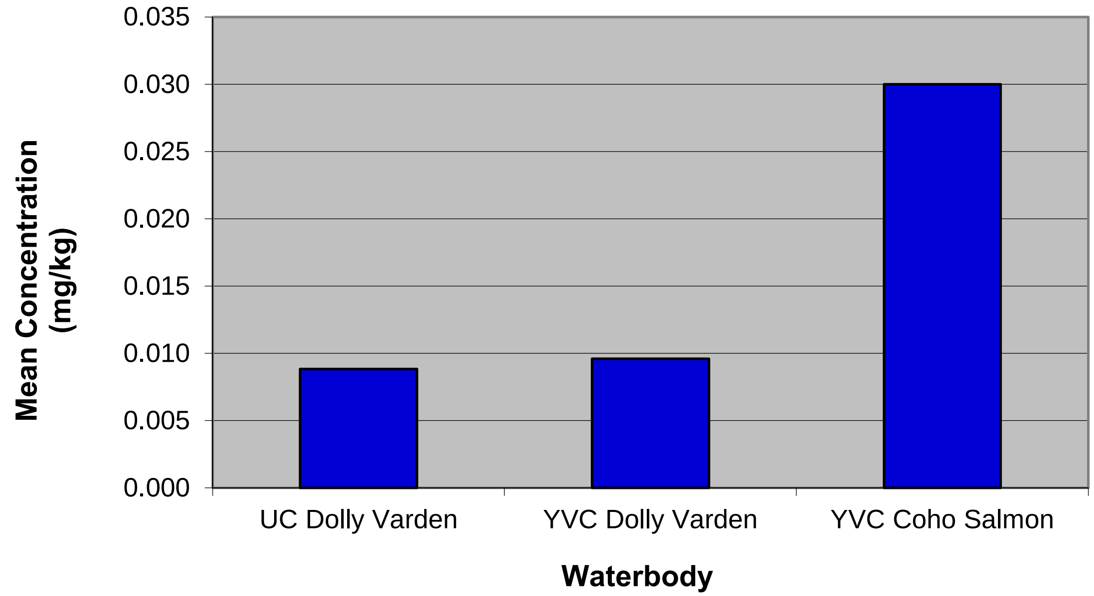

FIGURE 35.3-9
Mean Silver Concentrations in Whole Fish, Unnamed Creek (UC) and Y-Valley Creek (YVC), 2004 and 2005

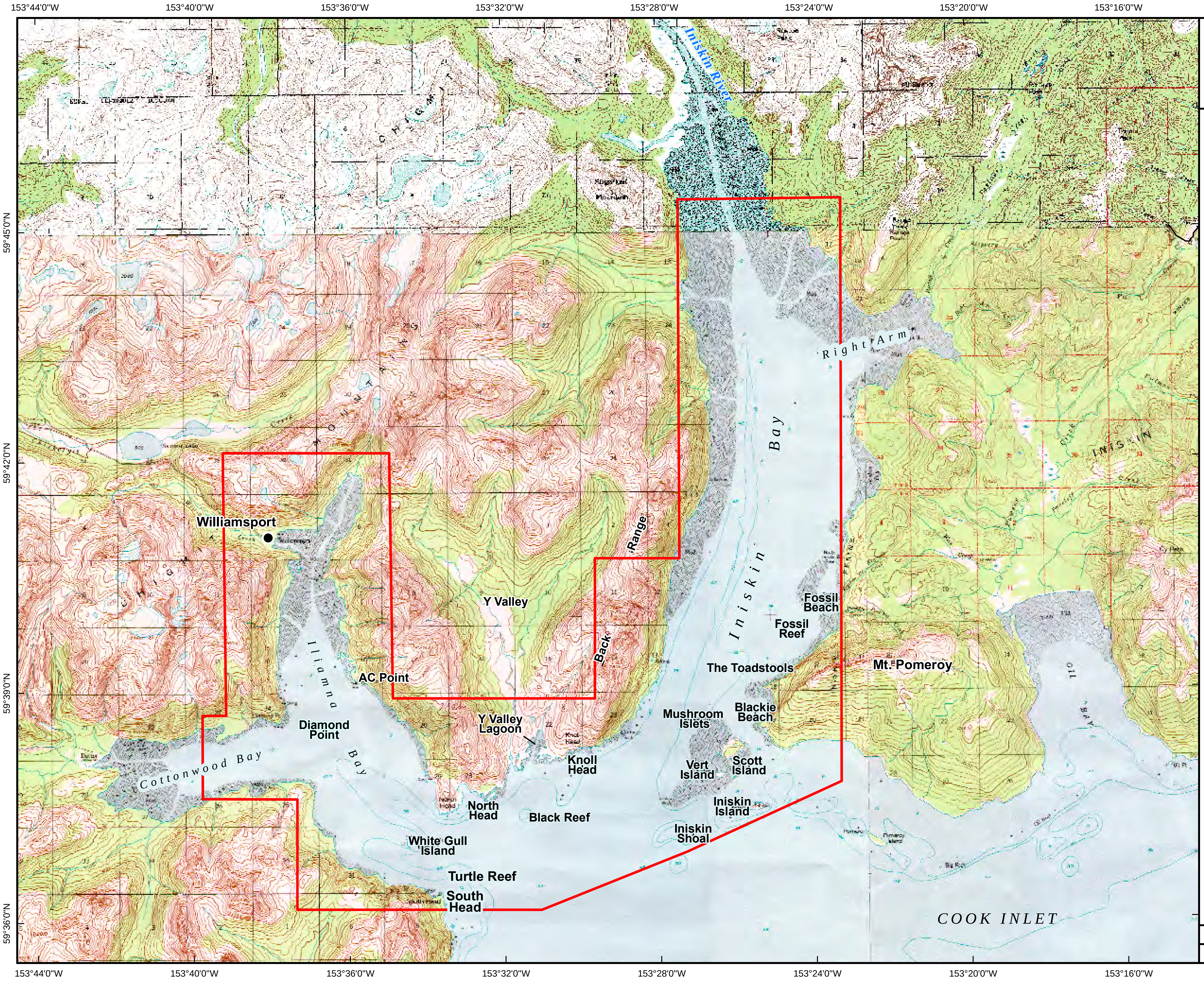

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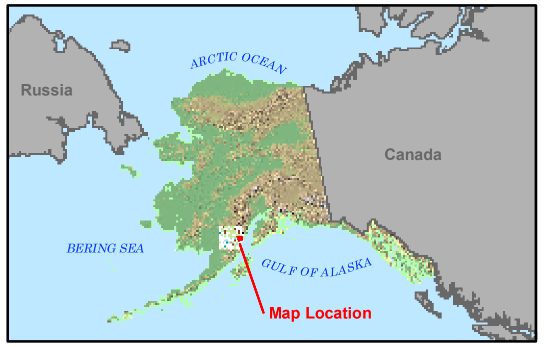
Figure 35.4-1
Marine Trace Elements Study Vicinity and the Iniskin-Iliamna Estuary Study Area, 2004 - 2008

Legend

IIE Study Area

Existing Community



Miles: 0, 0.5, 1, 1.5, 2, 2.5
Kilometers: 0, 1, 2, 3
Scale 1:90,000

N

Alaska State Plane Zone 5 (units feet)
1983 North American Datum

File: RDI_SA_Fig35-4-1_11X17L_1of1_D01.mxd	Date: July 7, 2011
Version: 1	Author: RDI-LS

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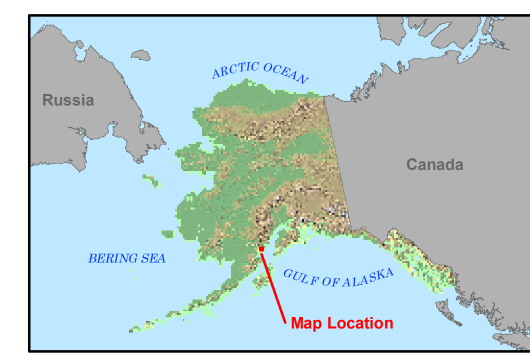
Figure 35.4-2a
Trace Elements Study, Sampling Stations for Marine Sediment, 2004-2008

Legend

- Intertidal Sediment Station
- MPS2 Intertidal Station Identification Code Example
- Subtidal Sediment Station
- MPS2 Subtidal Station Identification Code Example
- Existing Community

Note:
Sampling locations varied slightly for each sampling event; therefore, station locations depicted here are approximate.



0 0.5 1 1.5 Miles
0 0.5 1 1.5 2 Kilometers
Scale 1:41,323

N

Alaska State Plane Zone 5 (units feet)
1983 North American Datum

File: RDI_Pen_Fig35-4-2a_11X17L_1of1_D01.mxd	Date: June 28, 2011
Version: 1	Author: RDI-LS

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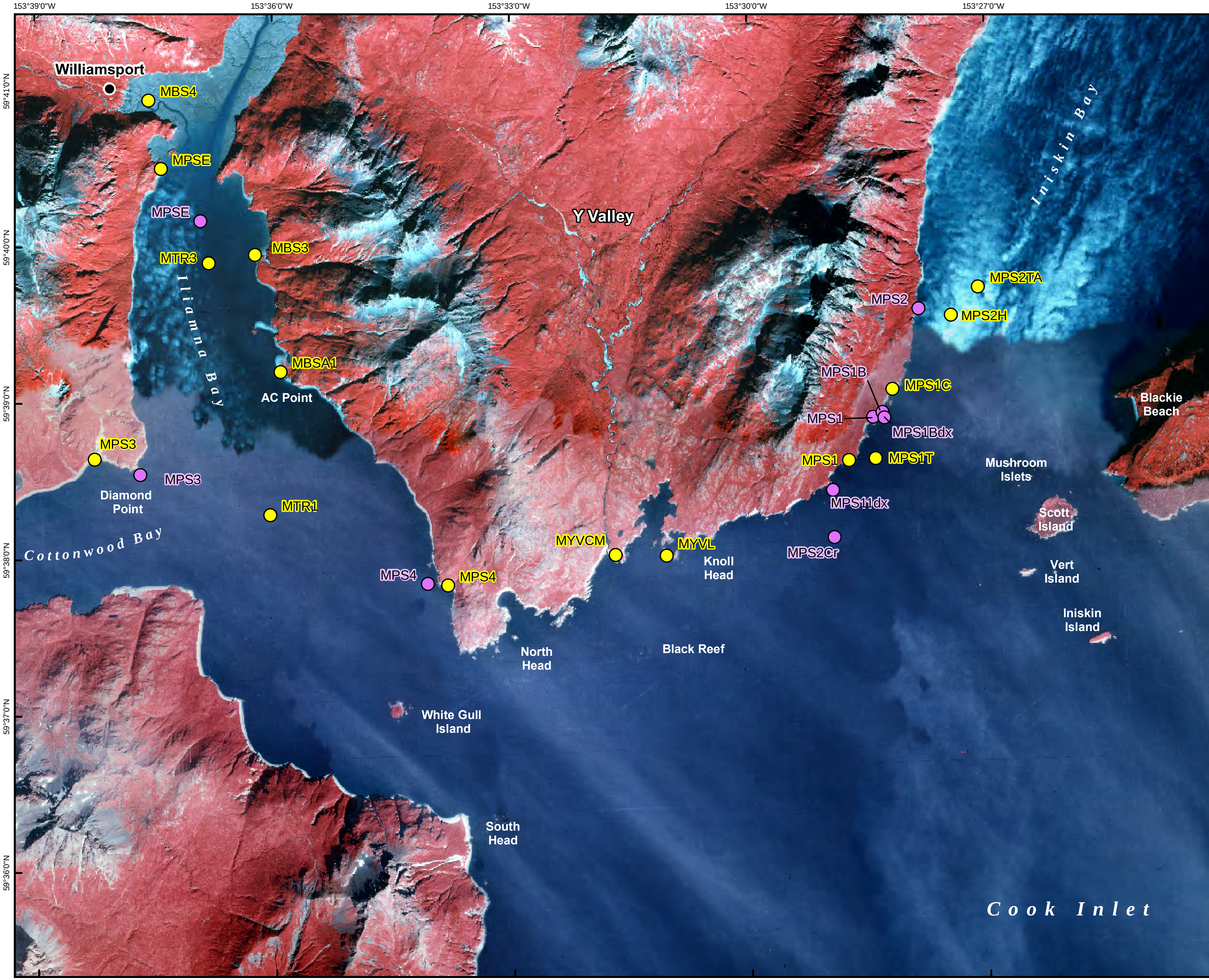
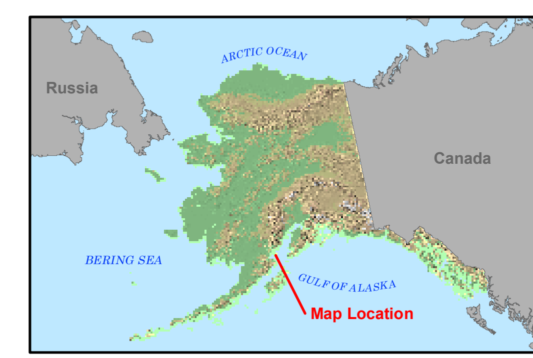
Figure 35.4-2b
Trace Elements Study,
Sampling Stations for Marine Tissue,
2004 and 2008



Legend

- Fish Tissue Sampling Stations
- MPS1 Fish Tissue Station Identification Code, Example
- Invertebrate and Plant Tissue Sampling Stations
- MPS1 Invertebrate and Plant Tissue Station Identification Code, Example
- Existing Community

Note:
Sampling locations varied slightly for each sampling event; therefore, station locations depicted here are approximate.



Miles: 0, 0.5, 1, 1.5
Kilometers: 0, 0.5, 1, 1.5, 2
Scale 1:45,000

N

Alaska State Plane Zone 5 (units feet)
1983 North American Datum

File: RDI_Pen_Fig35-4-2b_11x17L_V05.mxd	Date: June 28, 2011
Version: 5	Author: RDI-LS

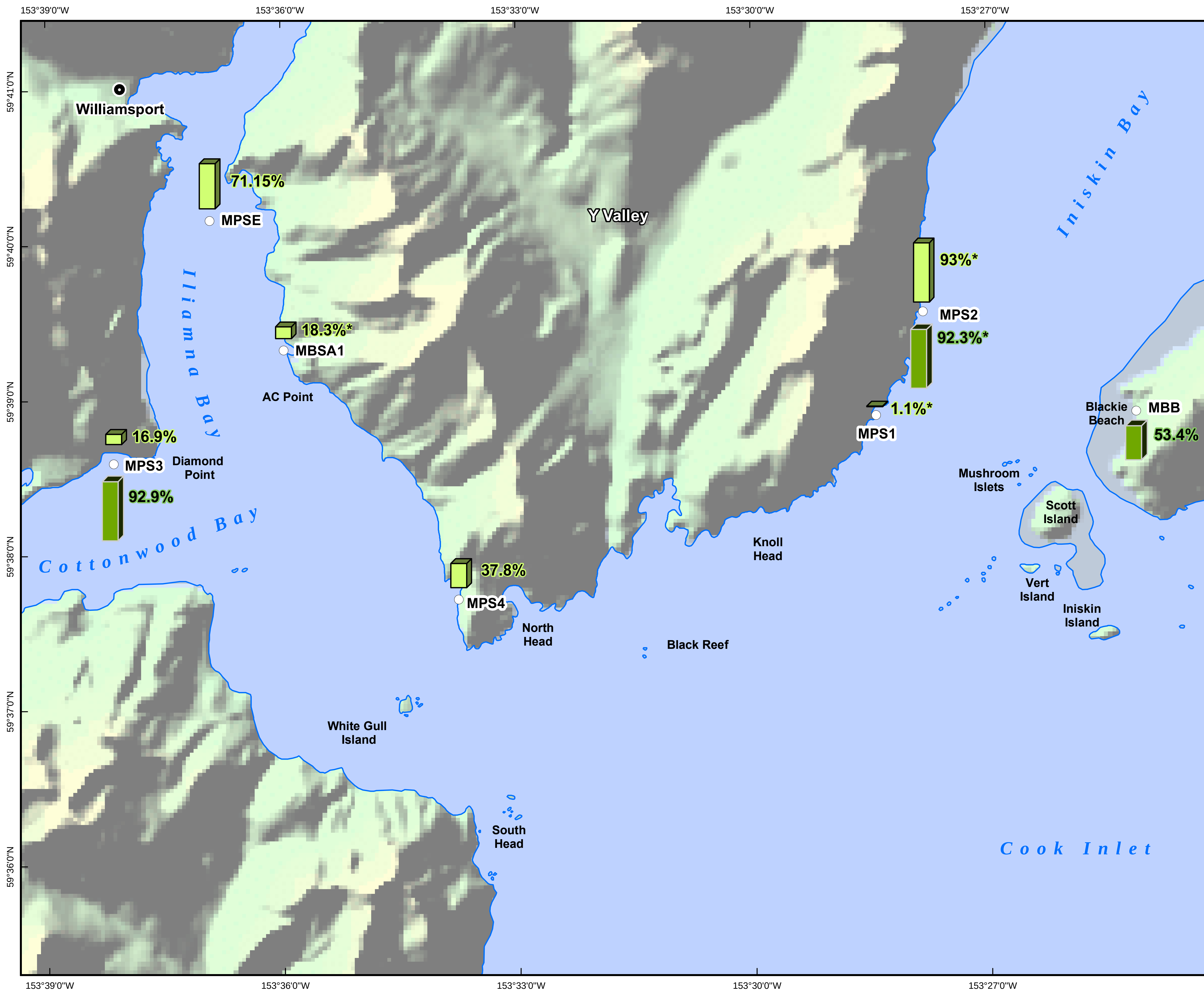


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Figure 35.4-3a
Trace Elements Study,
Median Grain Size (% Fines)
in Intertidal Marine Sediment,
2004 - 2008

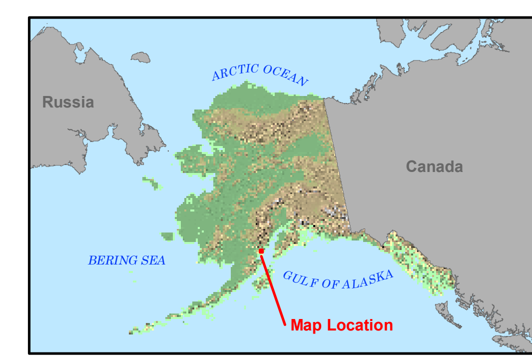
Legend

Intertidal Sediment Station
MPS2 Station Identification Code Example
% fines Middle Tidal Elevation
% fines Low Tidal Elevation
Existing Community

* Results for a single sample, not medians.

Scale: 20 40 60 80 100
Percent Fines

See Table 35.4-6 for individual results.



Miles 0 0.5 1 1.5
Kilometers 0 0.5 1 1.5 2 2.5
Scale 1:45,000

N

Alaska State Plane Zone 5 (units feet)
1983 North American Datum

File: RDI_Pen_Fine_Inter_Fig35-4-3a_11X17L_1of1_D06.mxd	Date: June 28, 2011
Version: 6	Author: RDI-LS

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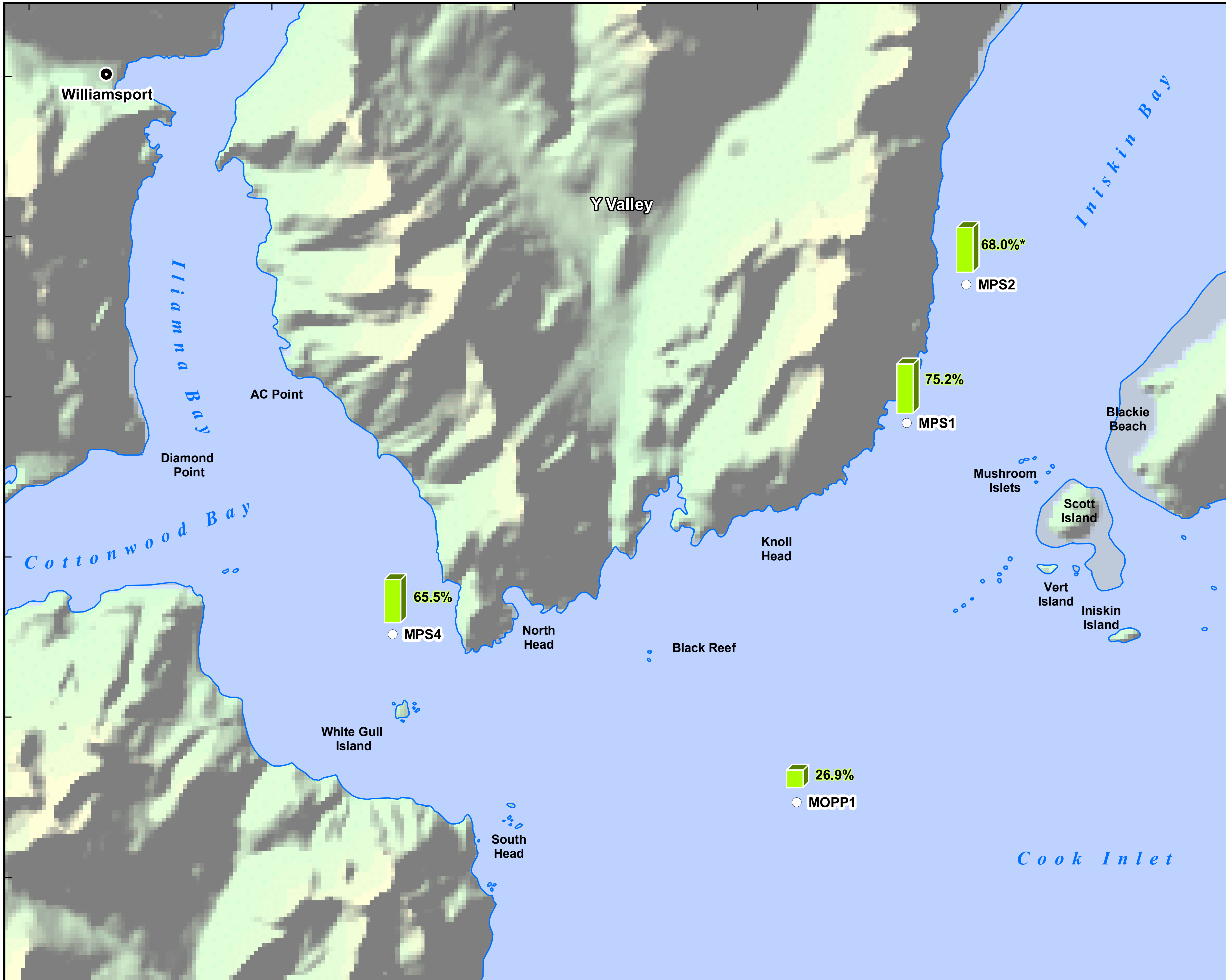
Figure 35.4-3b
Trace Elements Study,
Mean Grain Size (% Fines)
in Subtidal Marine Sediment,
2004 and 2008



Legend

○ Subtidal Sediment Station

MPS2 Station Identification Code Example

% fines

● Existing Community

* Value is the median of 5 replicates taken in 2004.

Scale: 20 40 60 80 100 Percent Fines

See Table 35.4-8 for individual results.
Means shown are calculated from the medians for multiple years.

Miles: 0 0.5 1 1.5

Kilometers: 0 0.5 1 1.5 2 2.5

Scale 1:45,000

N

Alaska State Plane Zone 5 (units feet)
1983 North American Datum

File: RDI_Pen_Fine_Sub_Fig35-4-3b_11X17L_1of1_D04.mxd	Date: June 29, 2011
Version: 4	Author: RDI-LS

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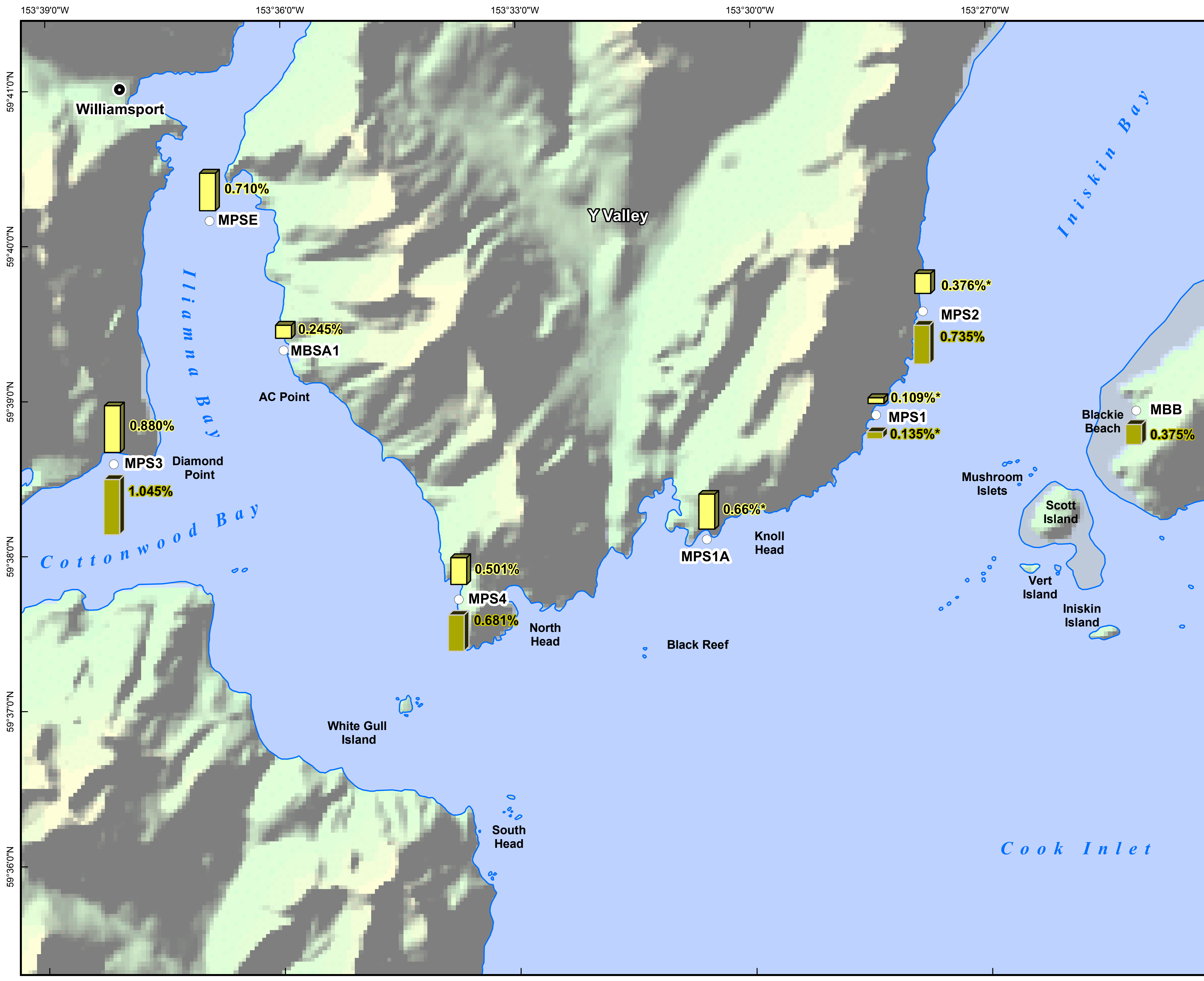
Figure 35.4-4a
Trace Elements Study, Median Total Organic Carbon (% TOC) in Intertidal Marine Sediment, 2004 - 2008



Legend

Intertidal Sediment Station

MPS2 Station Identification Code Example

% TOC Middle Tidal Elevation

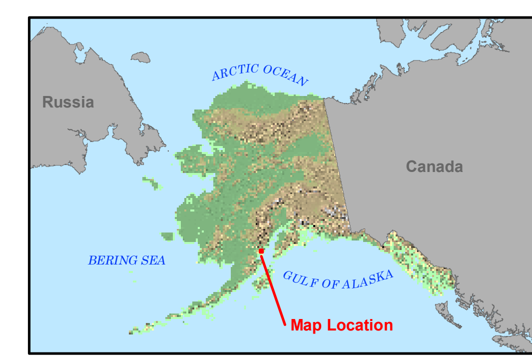
% TOC Low Tidal Elevation

Existing Community

*Results for a single sample, not medians.

Scale: .25 .50 .75 1.0 1.25
Percent TOC

See Table 35.4-6 for individual results.



Miles: 0 0.5 1 1.5

Kilometers: 0 0.5 1 1.5 2 2.5

Scale 1:45,000

N

Alaska State Plane Zone 5 (units feet)
1983 North American Datum

File: RDI_Pen_TOC_Inter_Fig35-4-4a_11X17L_1of1_D06.mxd	Date: June 29, 2011
Version: 6	Author: RDI-LS

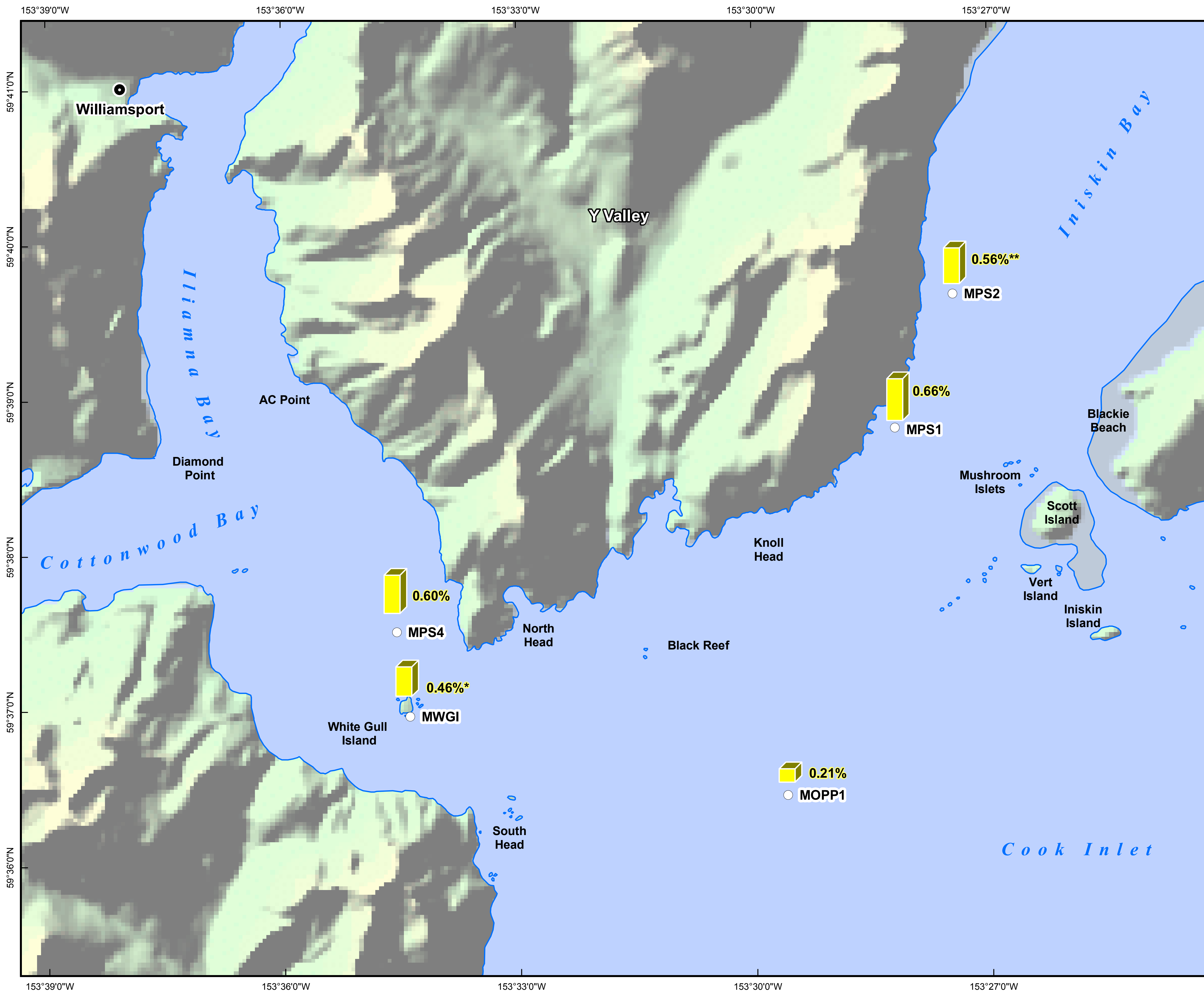


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Figure 35.4-4b
Trace Elements Study,
Mean Total Organic Carbon (% TOC)
in Subtidal Marine Sediment,
2004 and 2008

Legend

Subtidal Sediment Station

MPS2 Station Identification Code Example

% TOC

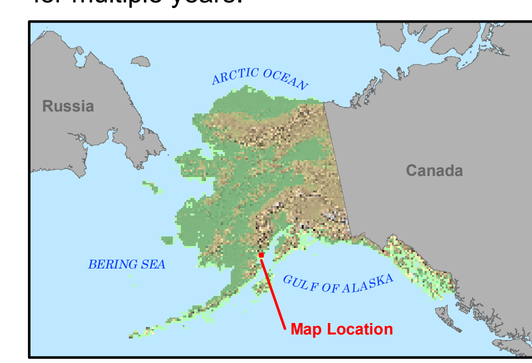
Existing Community

* Result for a single sample, not a mean

* *Value is the median of 5 replicates taken in 2004

Scale: .20 .40 .60 .80 1.0
Percent TOC

See Table 35.4-8 for individual results.
Means shown are calculated from the medians for multiple years.



Miles: 0 0.5 1 1.5

Kilometers: 0 0.5 1 1.5 2 2.5

Scale 1:45,000

N

Alaska State Plane Zone 5 (units feet)
1983 North American Datum

File: RDI_Pen_TOC_Sub_Fig35-4-4b_11X17L_1of1_D05.mxd	Date: June 28, 2011
Version: 5	Author: RDI-LS

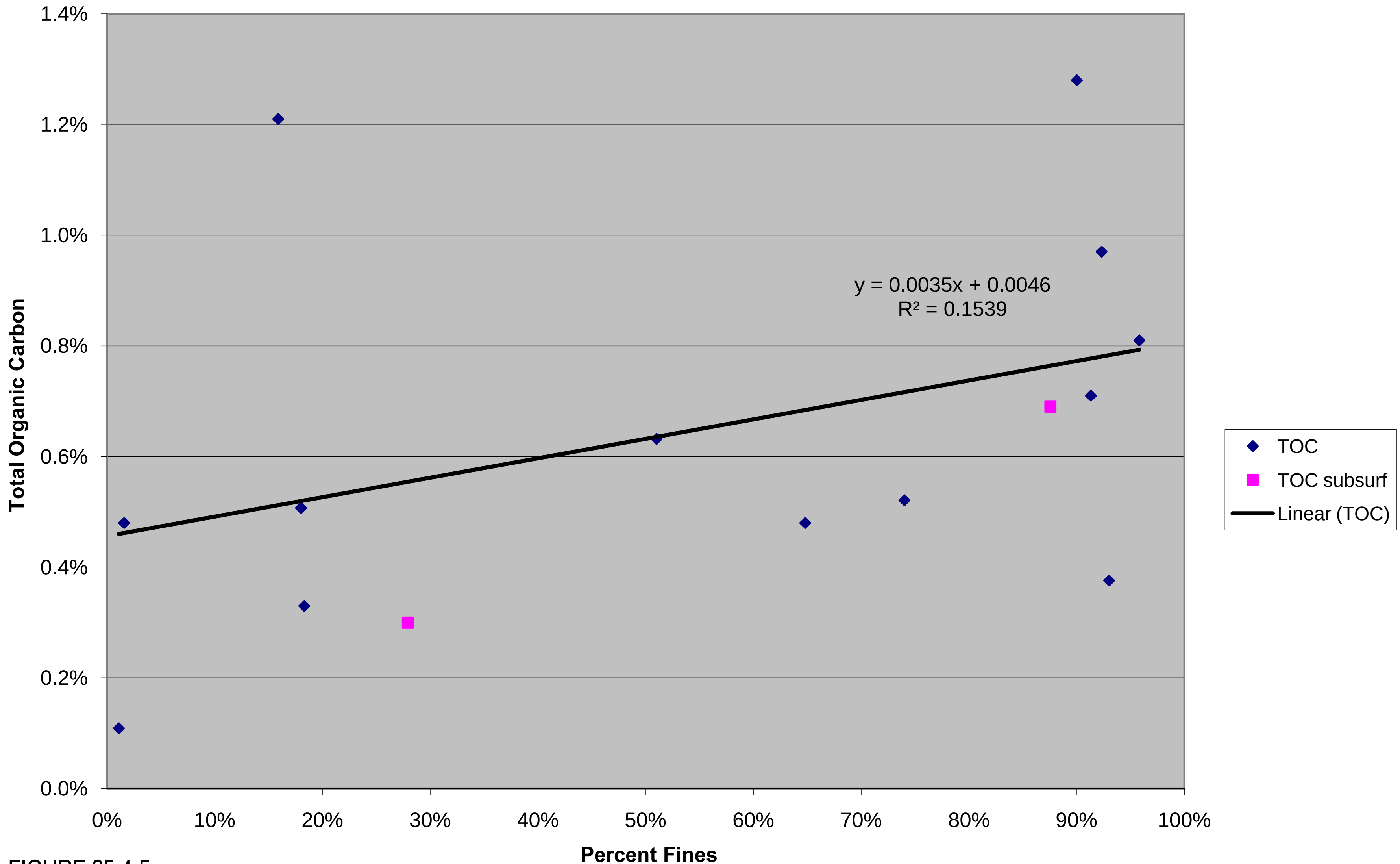


FIGURE 35.4-5
Regression of Total Organic Carbon (TOC) on Percent Fines for Intertidal Sediments

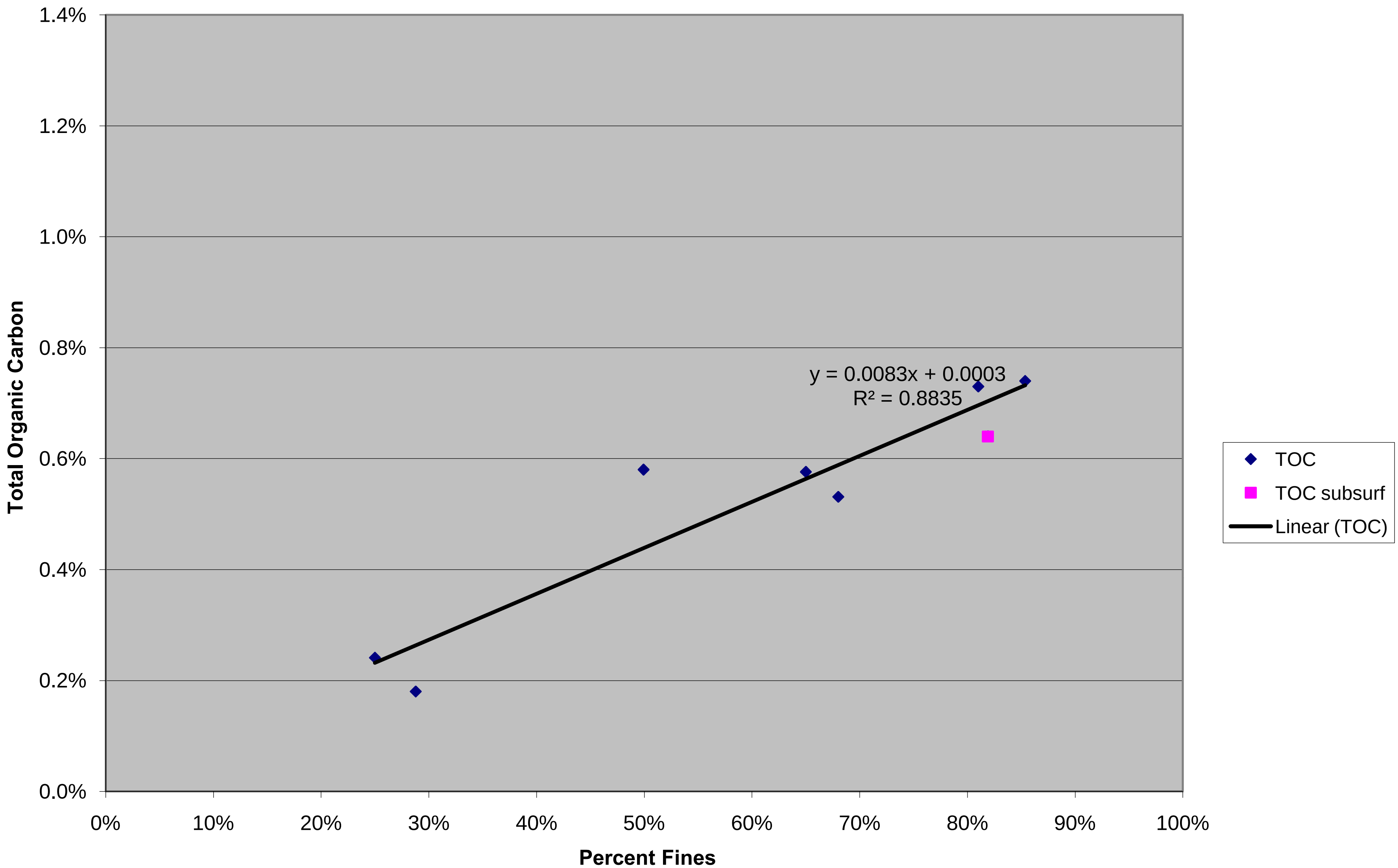


FIGURE 35.4-6
Regression of Total Organic Carbon (TOC) on Percent Fines for Subtidal Sediments

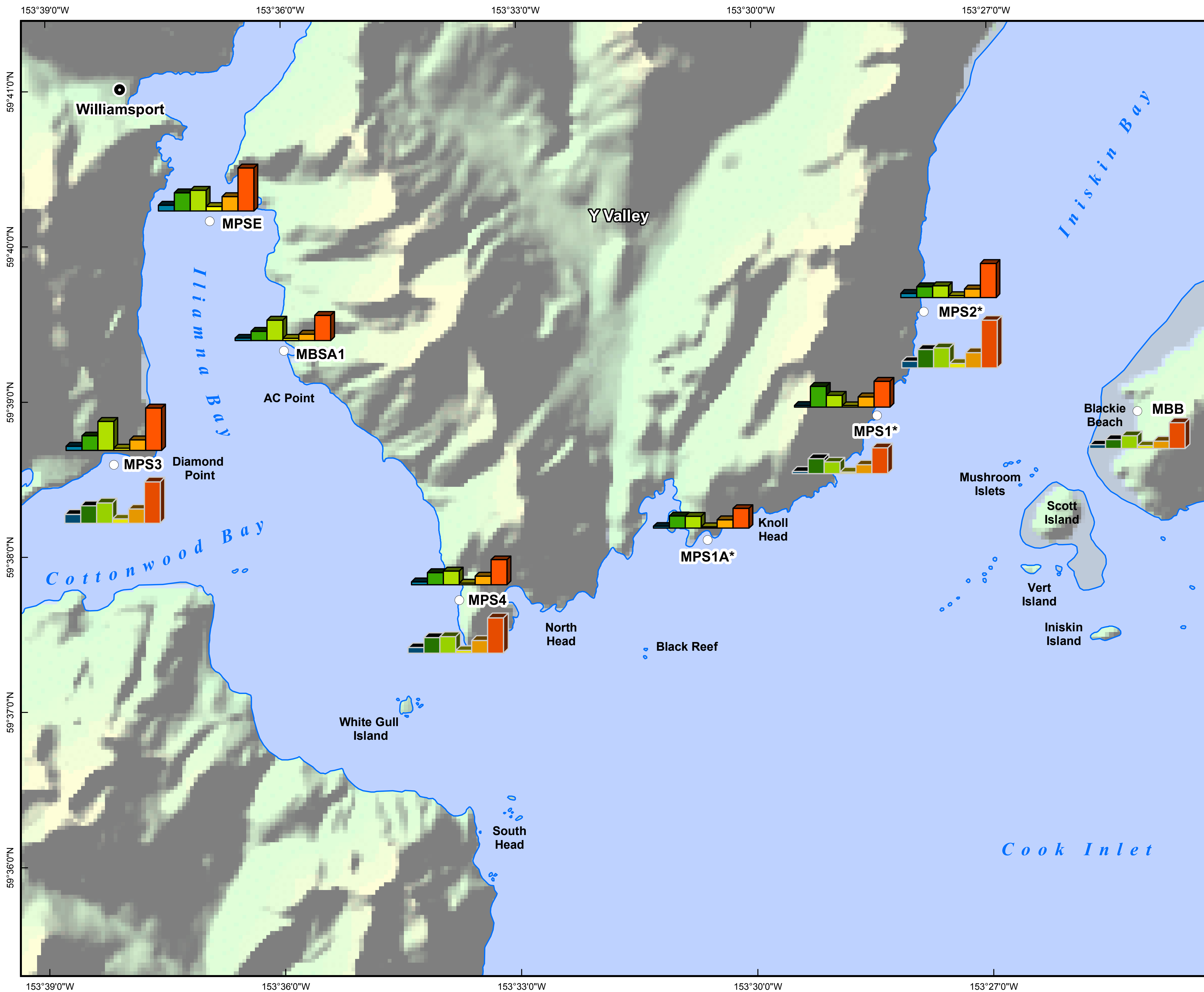


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Figure 35.4-7a
Trace Elements Study, Medians for High Concentration Analytes in Intertidal Marine Sediments, 2004 - 2008

Legend

○ Intertidal Sediment Station

MPS2 Station Identification Code Example

Analytes Middle Tidal Elevation	Analytes Low Tidal Elevation
Arsenic	Arsenic
Chromium	Chromium
Copper	Copper
Lead	Lead
Nickel	Nickel
Zinc	Zinc

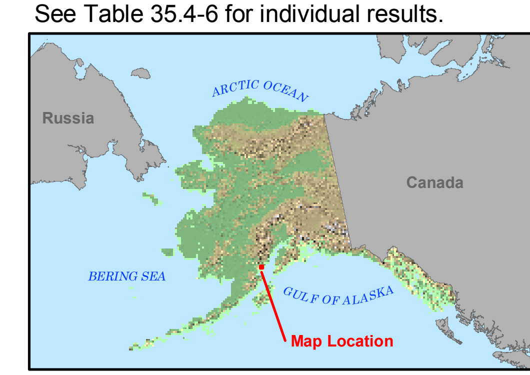
● Existing Community

* Results for a single sample, not a median.

Scale: 0 20K 40K 60K 80K 100K

Concentrations in µg/kg

Results for the analytes on this figure were in the higher range for this study.
See Table 35.4-6 for individual results.



Miles: 0 0.5 1 1.5

Kilometers: 0 0.5 1 1.5 2 2.5

N

Scale 1:45,000

Alaska State Plane Zone 5 (units feet)
1983 North American Datum

File: RDI_Pen_Hi_Inter_Fig35-4-7a_11X17L_1of1_D04.mxd	Date: June 29, 2011
Version: 4	Author: RDI-LS

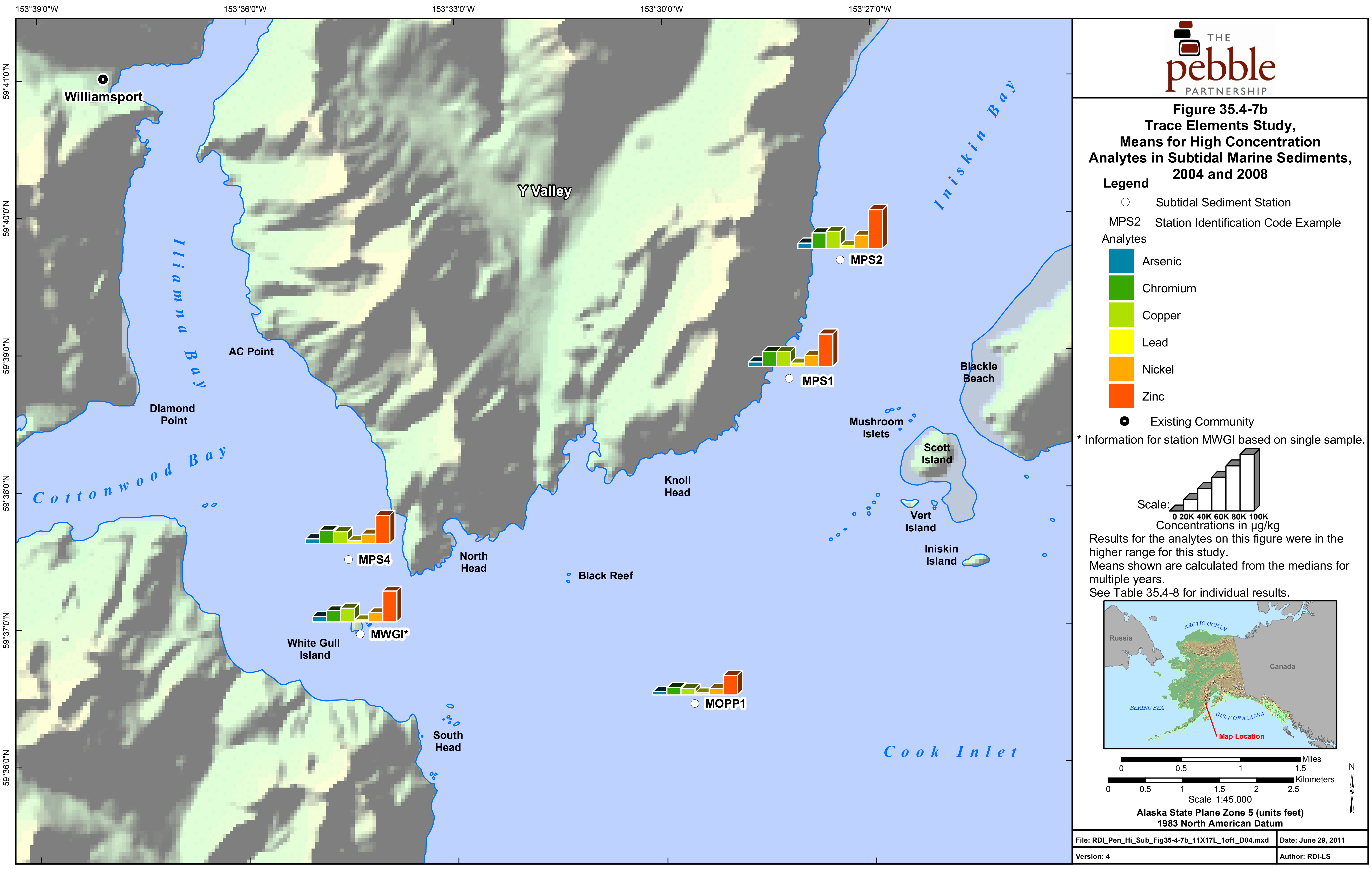


Figure 35.4-7b
Trace Elements Study, Means for High Concentration Analytes in Subtidal Marine Sediments, 2004 and 2008

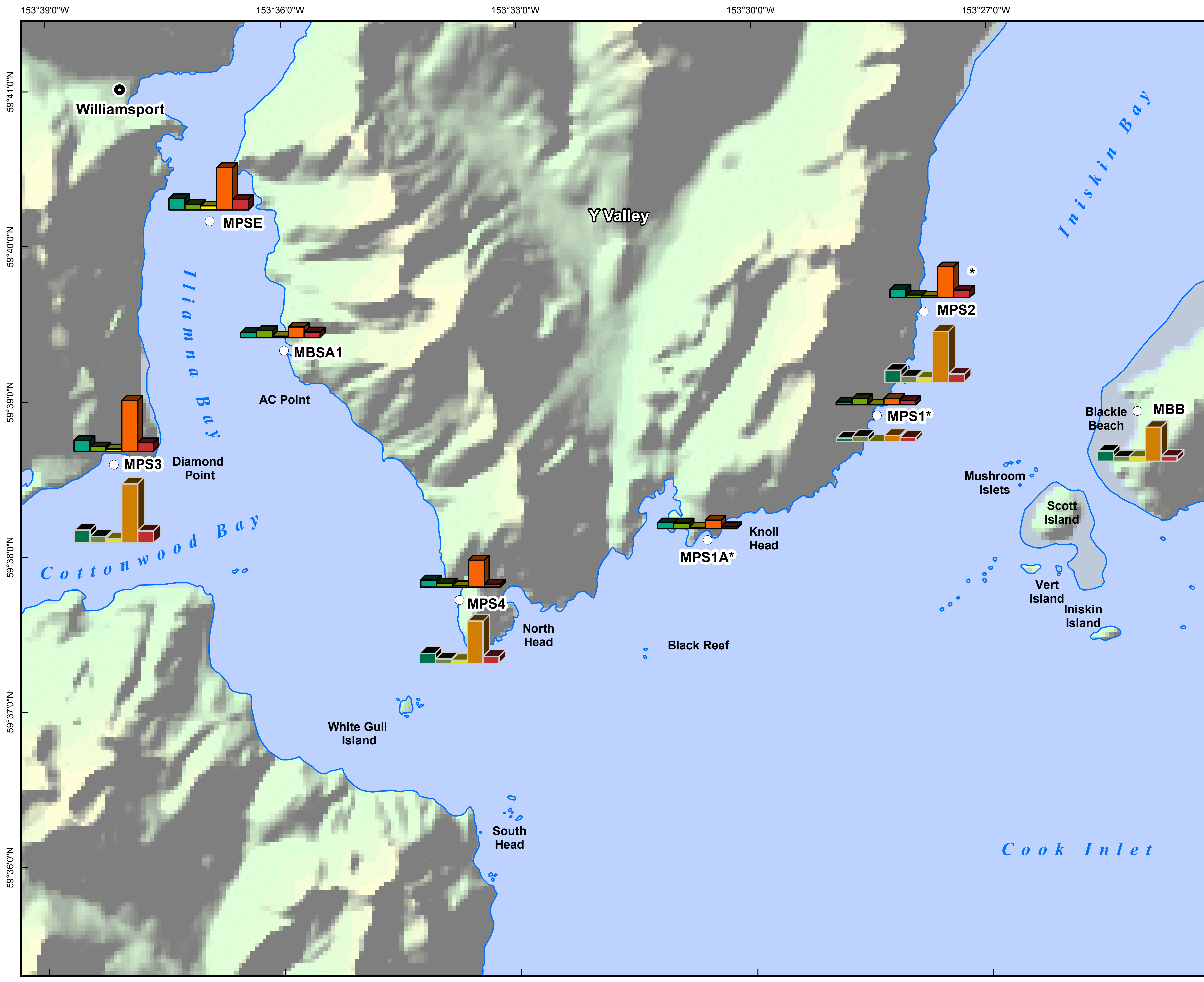


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Figure 35.4-8a
Trace Elements Study,
Medians for Low Concentration
Analytes in Intertidal Marine Sediments,
2004 – 2008

Legend

Intertidal Sediment Station

MPS2 Station Identification Code Example

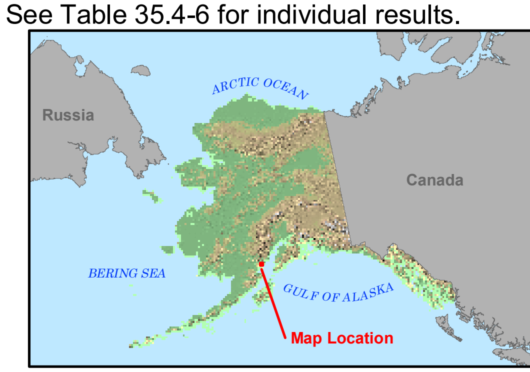
Analytes Middle Tide Elevatioin	Analytes Low Tide Elevatioin
Antimony	Antimony
Cadmium	Cadmium
Mercury	Mercury
Selenium	Selenium
Silver	Silver

Existing Community

* Results for a single sample, not a median.

Scale: 150 300 450 600 750
Concentrations in µg/kg

Results for the analytes on this figure were in the lower range for this study.
See Table 35.4-6 for individual results.



Miles: 0 0.5 1 1.5
Kilometers: 0 0.5 1 1.5 2 2.5
N
Scale 1:45,000
Alaska State Plane Zone 5 (units feet)
1983 North American Datum

File: RDI_Pen_Lo_Inter_Fig35-4-8a_11X17L_1of1_D04.mxd	Date: June 29, 2011
Version: 4	Author: RDI-LS

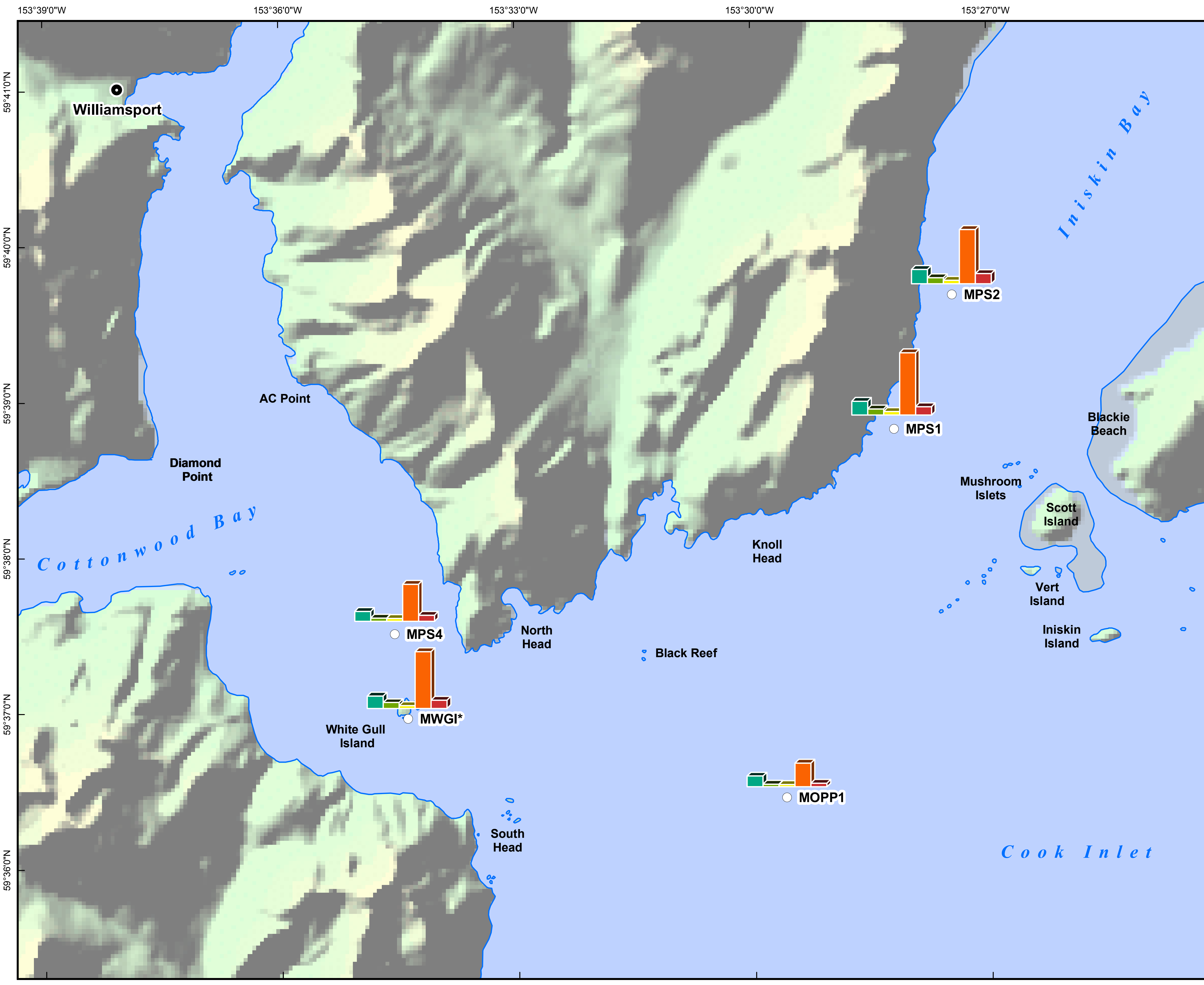


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Figure 35.4-8b
Trace Elements Study,
Means for Low Concentration
Analytes in Subtidal Marine Sediments,
2004 and 2008

Legend

Subtidal Sediment Station

MPS2 Station Identification Code Example

Analytes

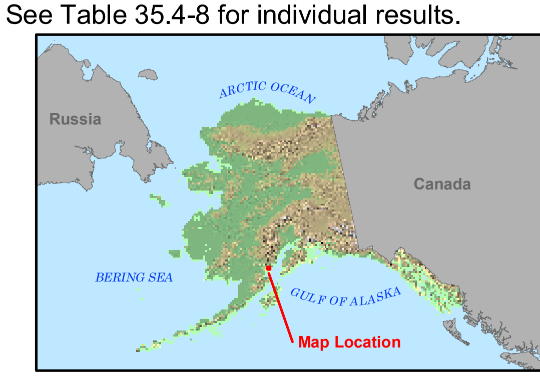
- Antimony
- Cadmium
- Mercury
- Selenium
- Silver

Existing Community

* Information for station MWGI based on single sample.

Scale: 150 300 450 600 750
Concentrations in µg/kg

Results for the analytes on this figure were in the lower range for this study.
Means shown are calculated from the medians for multiple years.
See Table 35.4-8 for individual results.



Miles: 0 0.5 1 1.5
Kilometers: 0 0.5 1 1.5 2 2.5
N

Scale 1:45,000

Alaska State Plane Zone 5 (units feet)
1983 North American Datum

File: RDI_Pen_Lo_Sub_Fig35-4-8b_11X17L_1of1_D04.mxd	Date: June 29, 2011
Version: 4	Author: RDI-LS

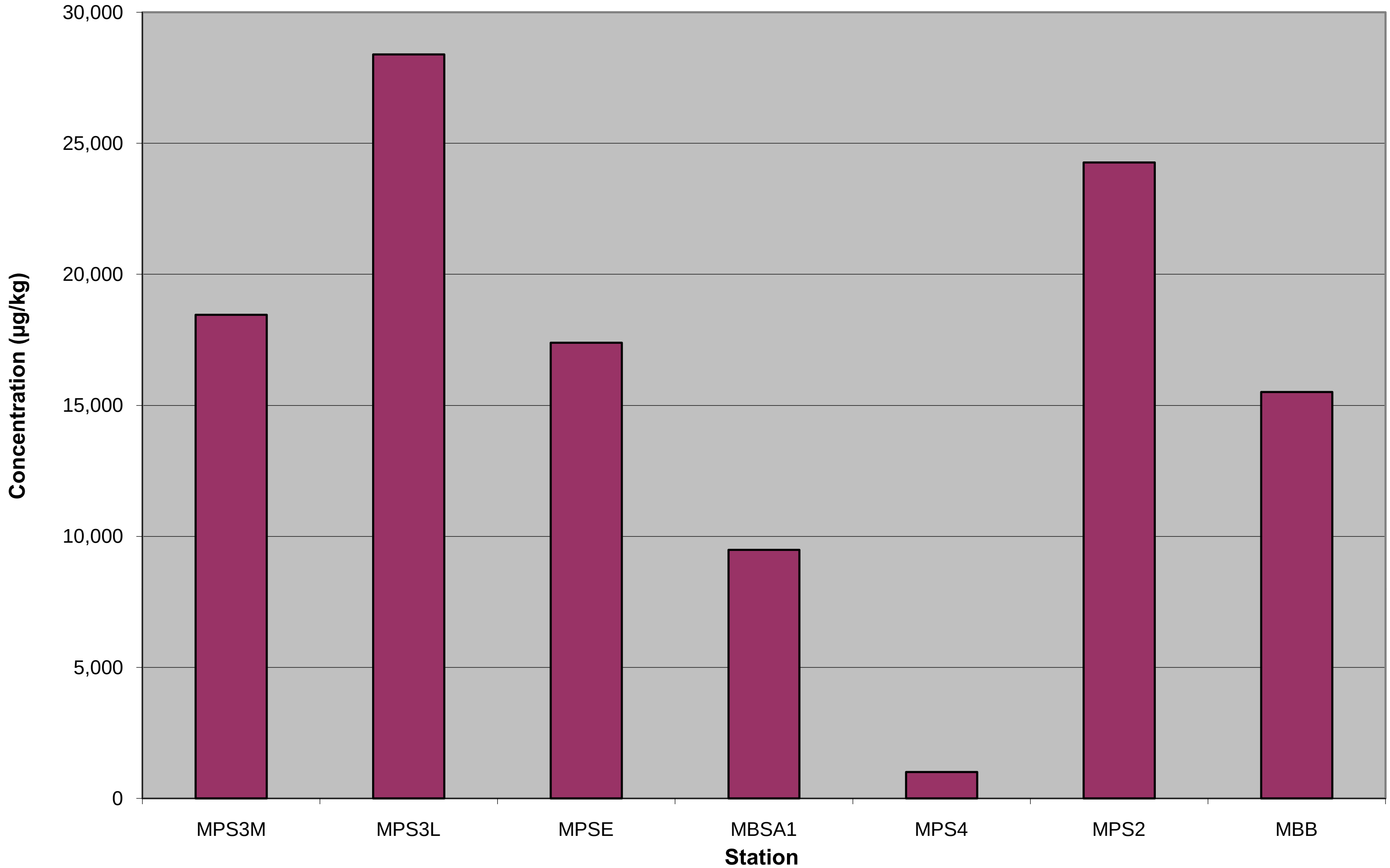
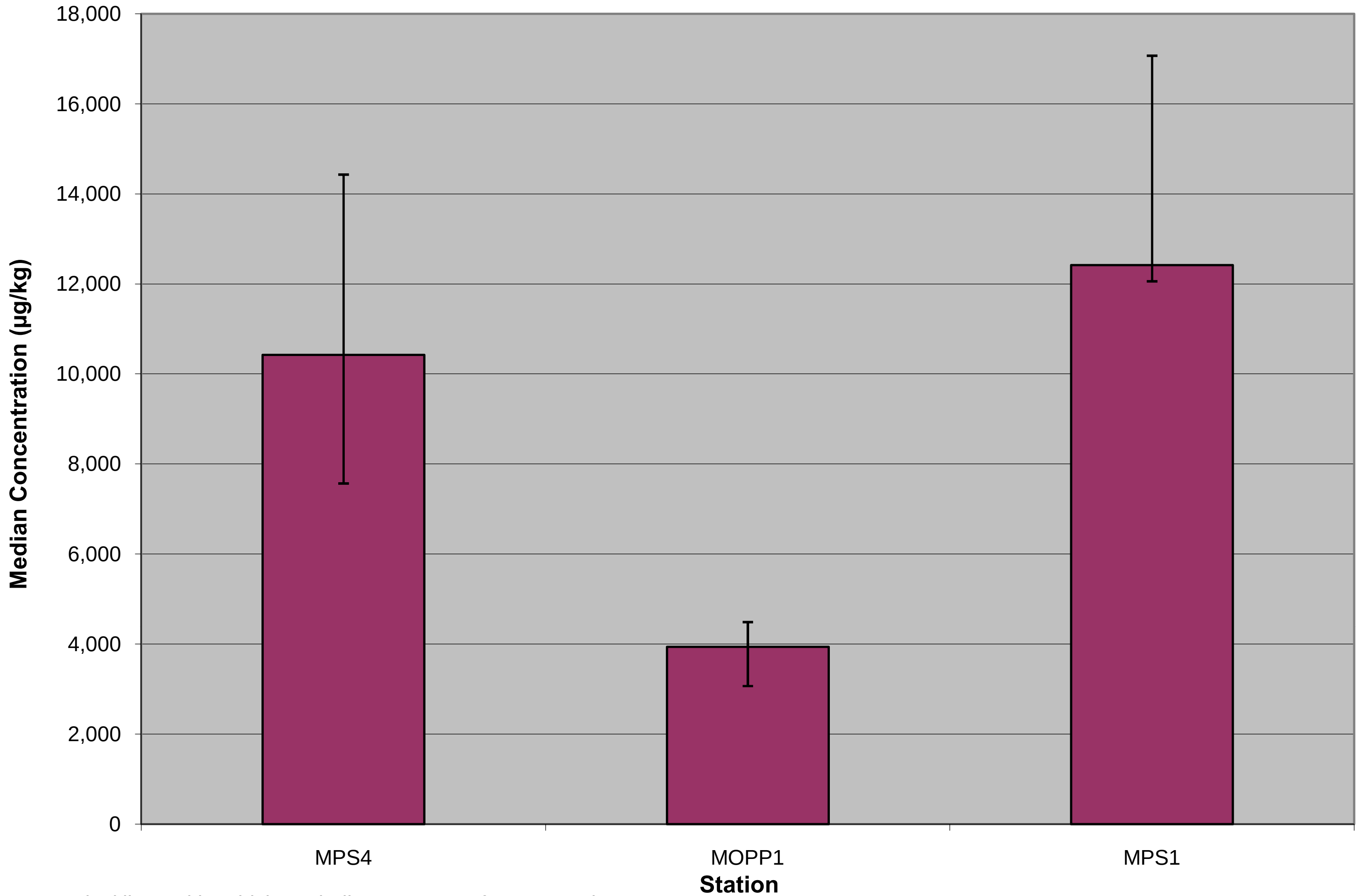


FIGURE 35.4-9
Total Petroleum Hydrocarbons in Intertidal Sediments, July 2008



Note: Vertical lines with "whiskers" indicate ranges of concentrations.

FIGURE 35.4-10
Total Petroleum Hydrocarbons in Subtidal Sediments, July 2008

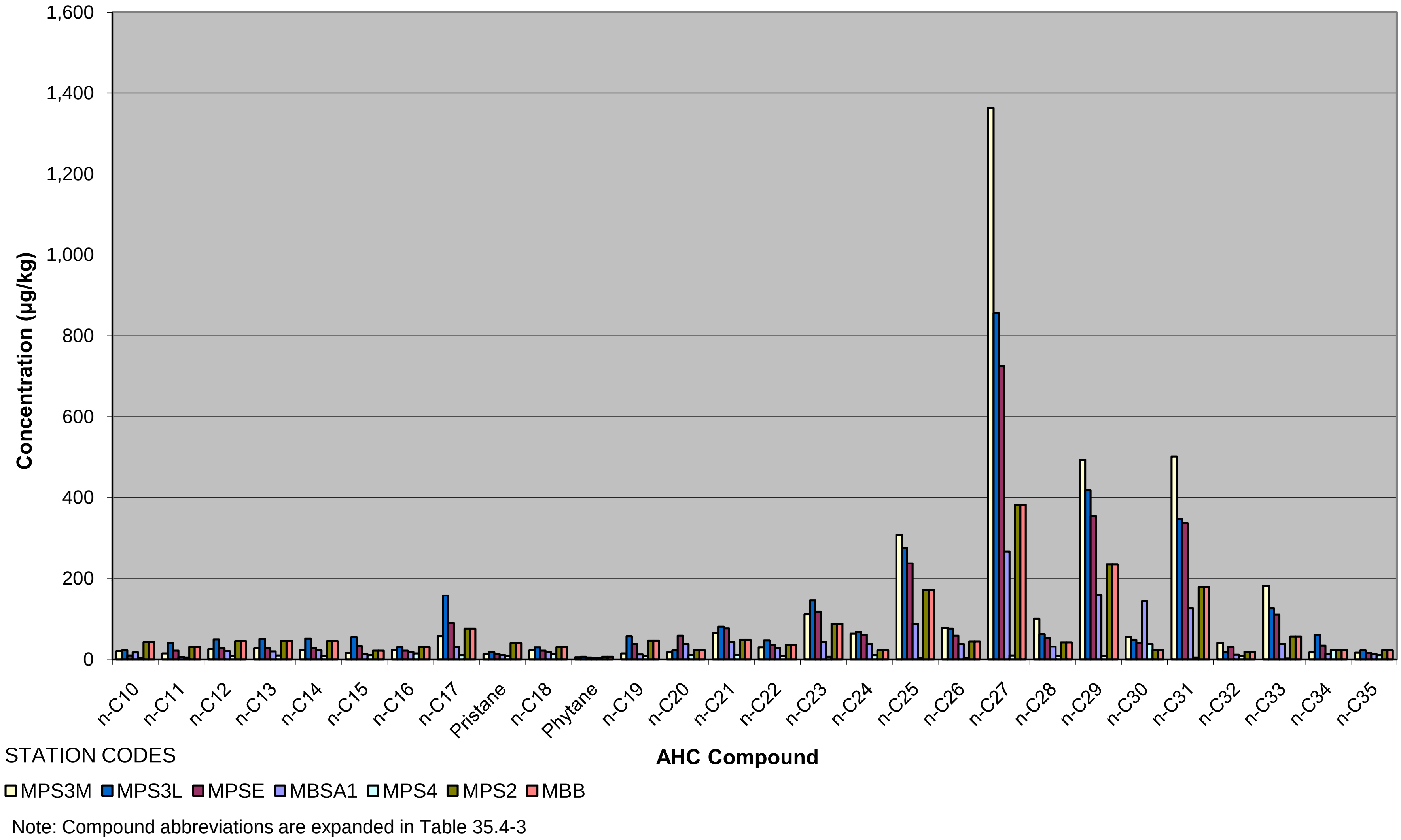
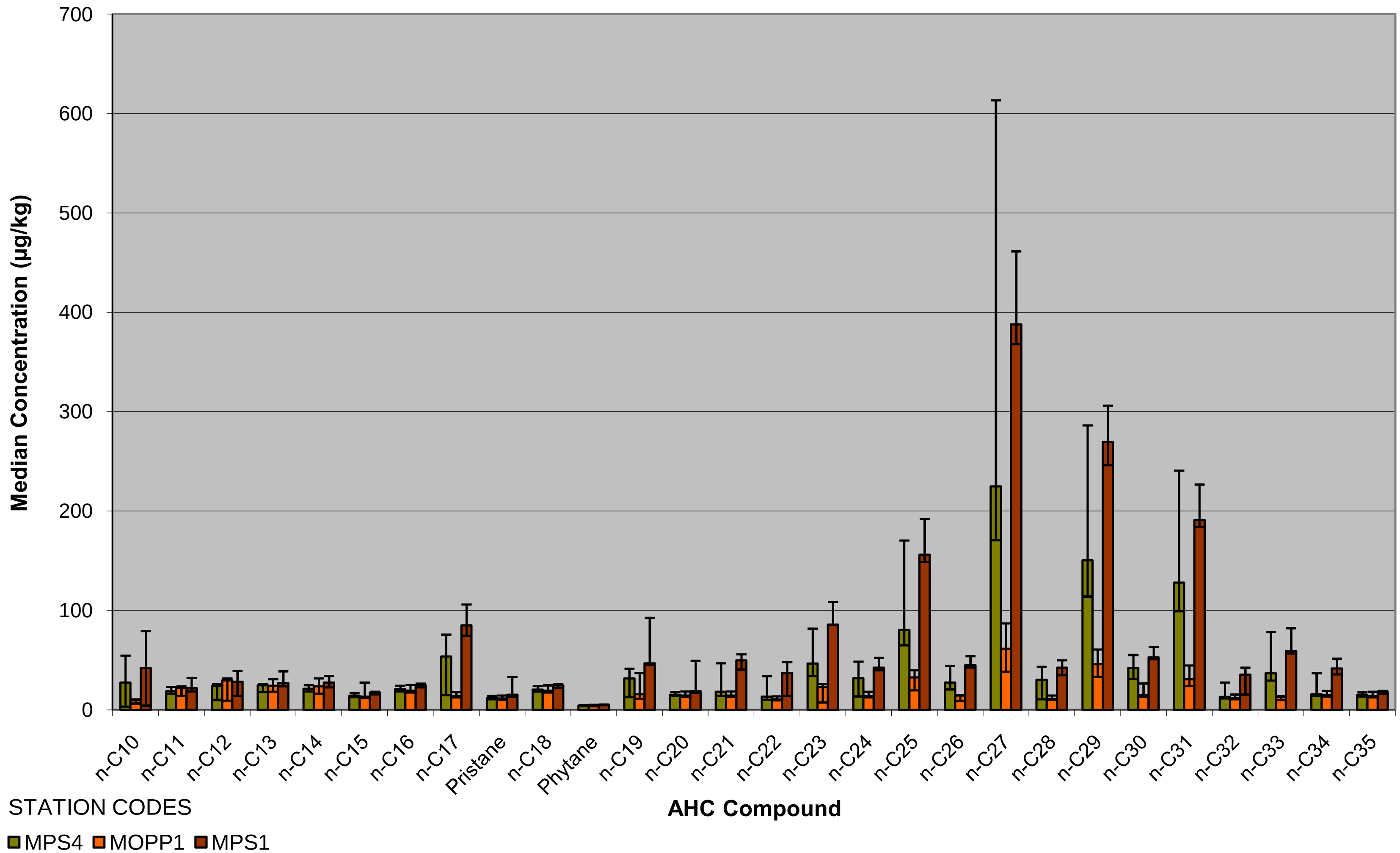


FIGURE 35.4-11
Concentrations of Aliphatic Hydrocarbons (AHCs) in Intertidal Sediments, July 2008



Notes: Compound abbreviations are expanded in Table 35.4-3.
Vertical lines with "whiskers" indicate ranges of concentrations.

FIGURE 35.4-12
Concentrations of Aliphatic Hydrocarbons (AHCs) in Subtidal Sediments, July 2008

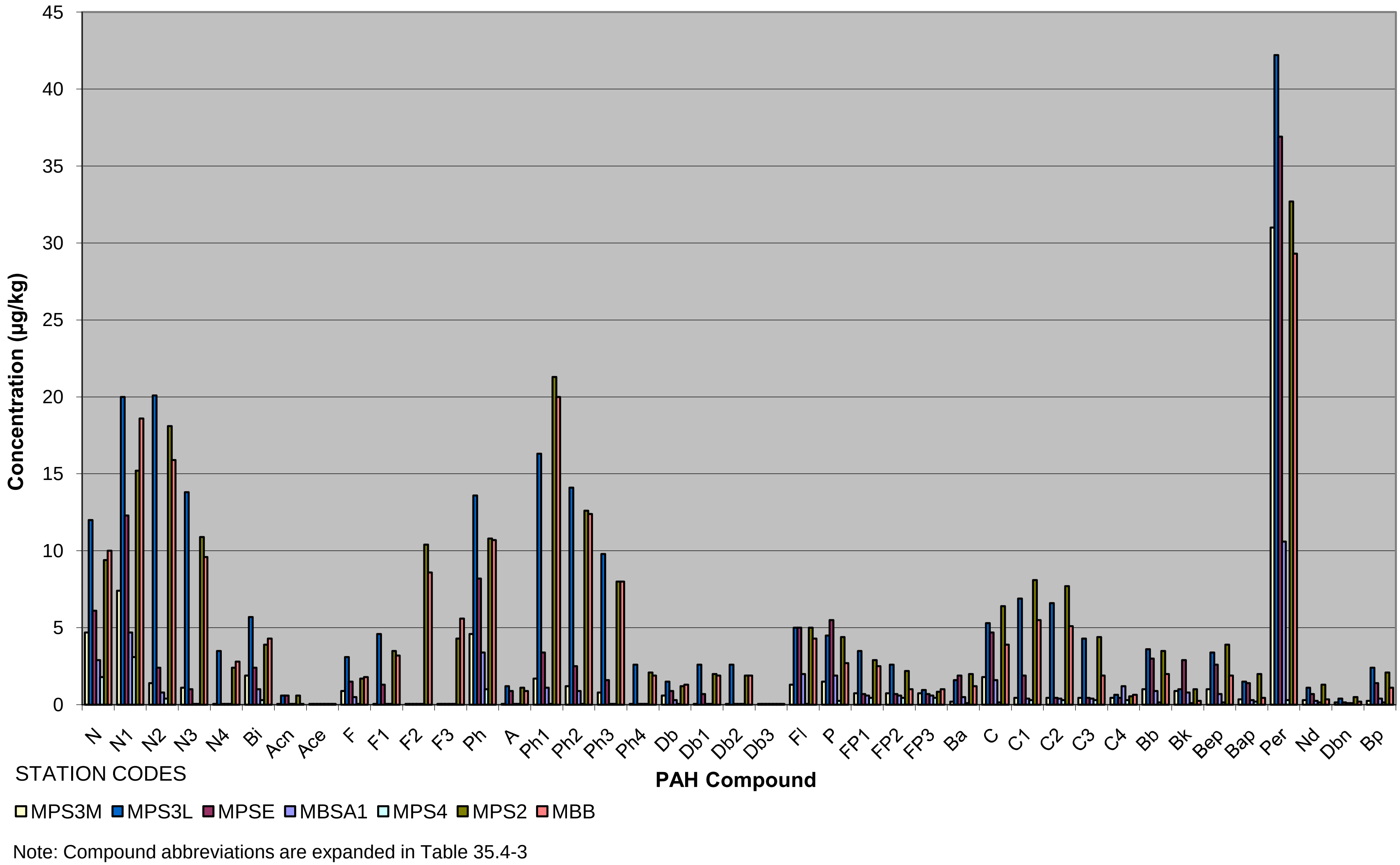
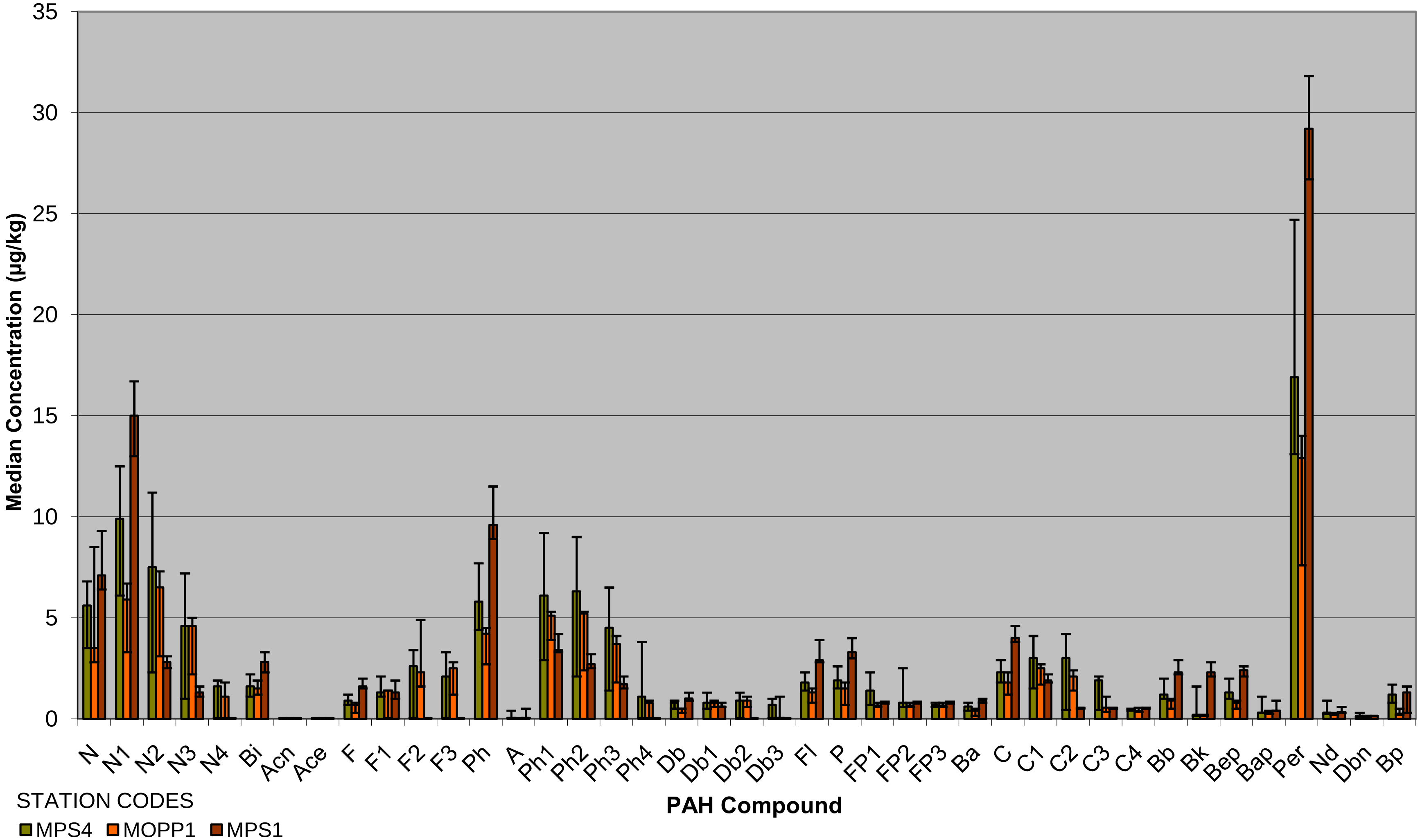


FIGURE 35.4-13
Concentrations of Polynuclear Aromatic Hydrocarbons (PAHs) in Intertidal Sediments, July 2008



Notes: Compound abbreviations are expanded in Table 35.4-3.
Vertical lines with "whiskers" indicate ranges of concentrations.

FIGURE 35.4-14
Concentrations of Polynuclear Aromatic Hydrocarbons (PAHs) in Subtidal Sediments, July 2008

APPENDICES

APPENDIX 35.1A

Photographic Log, Soil and Vegetation Sampling

Photographic Log, Soil and Vegetation Sampling

2004 Sample Site TE18

2004 Sample Site TE19

2004 Sample Site TE19

2004 Sample Site TE20

2004 Sample Site TE20

2004 Sample Site TE20

Photographic Log, Soil and Vegetation Sampling

2004 Sample Site TE20

2004 Sample Site TE21

2004 Sample Site TE22

2004 Sample Site TE23

2004 Sample Site TE24

APPENDIX 35.1B

Soil Sample Results, Cook Inlet Drainages Study Area, 2004 and 2006

Appendix 35.1B. Soil Sample Results, Cook Inlet Drainages Study Area, 2004 and 2006

STATION	Total Solids	Organic Carbon	Chloride	Fluoride	Sulfate	Total Cyanide	Ammonia	Aluminum	Antimony	Arsenic	Barium	Beryllium	Bismuth	Boron	Cadmium	Calcium	Chromium	Cobalt	Copper	Iron	Lead	Magnesium	Manganese	Mercury	Molybdenum
	Wet	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
	percent	percent	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
TE18																									
Sample Date																									
08/18/04	84.6	4.51	**0.60**	**0.183**	2.86	0.21	106	24800	**0.115**	3.32	173	0.116	**0.0361**	**1.81**	**0.0361**	10300	7.55	9.84	60.2	24000	2.25	7190	274	0.0518	**0.181**
08/29/06	69.7	4.63	**0.222**	**0.222**	**1.06**	0.083	130	250000	**0.0213**	1.89	221	**0.0699**	**0.0426**	2.52	**0.0426**	7560	3.33	7.52	66.3	14400	2.74	5730	215	**0.0301**	**0.213**
Mean	77.2	4.57	0.41	0.202	1.96	0.15	120	140000	0.068	2.61	197	0.093	0.0393	2.16	0.0393	8900	5.44	8.68	63.3	19000	2.50	6460	245	0.0410	0.197
Median	77.2	4.57	0.41	0.202	1.96	0.15	120	140000	0.068	2.61	197	0.093	0.0393	2.16	0.0393	8900	5.44	8.68	63.3	19000	2.50	6460	245	0.0410	0.197
St. Deviation	10.5	0.08	0.27	0.028	1.27	0.09	20	160000	0.066	1.01	34	0.033	0.0046	0.51	0.0046	1900	2.98	1.64	4.3	7000	0.35	1030	42	0.0153	0.023
# of values	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Minimum	69.7	4.51	0.222	0.183	1.06	0.083	106	24800	0.0213	1.89	173	0.0699	0.0361	1.81	0.0361	7560	3.33	7.52	60.2	14400	2.25	5730	215	0.0301	0.181
Maximum	84.6	4.63	0.60	0.222	2.86	0.21	130	250000	0.115	3.32	221	0.116	0.0426	2.52	0.0426	10300	7.55	9.84	66.3	24000	2.74	7190	274	0.0518	0.213
% of values undetected			50%	100%					50%				100%	50%	100%										100%
of values between MDL and MRL			1		1				1			1												1	
TE19																									
Sample Date																									
08/18/04	55.9	30.9	5.02	**0.270**	8.87	0.71	391	17400	**0.113**	8.18	18.0	**0.066**	**0.282**	**2.67**	**0.253**	3110	8.64	3.82	202	13400	5.58	3410	133	0.0995	2.28
08/29/06	34.3	25.4	3.87	**0.451**	7.07	0.20	696	8960	**0.0442**	3.45	45.3	**0.0442**	**0.0885**	5.93	**0.0885**	6880	5.44	6.56	76.6	12100	2.43	6200	669	**0.0423**	**0.442**
Mean	45.1	28.2	4.45	0.36	7.97	0.46	544	13200	0.079	5.82	32.0	0.0551	0.185	4.3	0.17	5000	7.04	5.19	139	12800	4.01	4800	401	0.0709	1.36
Median	45.1	28.2	4.45	0.36	7.97	0.46	544	13200	0.079	5.82	32.0	0.0551	0.185	4.3	0.17	5000	7.04	5.19	139	12800	4.01	4800	401	0.0709	1.36
St. Deviation	15.3	3.9	0.81	0.13	1.27	0.36	216	6000	0.049	3.34	19	0.0155	0.137	2.31	0.116	2670	2.26	1.94	89	900	2.23	2000	379	0.0404	1.3
# of values	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Minimum	34.3	25.4	3.87	0.270	7.07	0.2	391	8960	0.0442	3.45	18.0	0.0442	0.0885	2.67	0.0885	3110	5.44	3.82	76.6	12100	2.43	3410	133	0.0423	0.442
Maximum	55.9	30.9	5.02	0.451	8.87	0.71	696	17400	0.113	8.18	45.3	0.066	0.282	5.93	0.253	6880	8.64	6.56	202	13400	5.58	6200	669	0.0995	2.28
% of values undetected				100%					50%			50%	50%	50%	50%										50%
of values between MDL and MRL									1			1	1		1									1	
TE20																									
Sample Date																									
08/18/04	31.9	17.2	8.89	**1.19**	6.77	0.120	336	11200	**0.103**	**0.870**	29.8	**0.272**	**0.0945**	**4.72**	**0.341**	1560	4.42	2.35	10.2	7260	2.39	712	47.9	**0.108**	**1.27**
08/29/06	33.5	21.3	5.28	**0.463**	7.49	**0.047**	456	2950	**0.0448**	**0.448**	19.9	**0.0448**	**0.0895**	**1.47**	**0.0895**	1440	1.21	**0.949**	6.29	2670	1.75	466	21.0	**0.113**	**0.448**
Mean	32.7	19.3	7.09	0.83	7.13	0.080	396	7100	0.074	0.66	24.9	0.158	0.092	3.1	0.22	1500	2.82	1.65	8.20	4970	2.07	589	34.0	0.111	0.86
Median	32.7	19.3	7.09	0.83	7.13	0.080	396	7100	0.074	0.66	24.9	0.158	0.092	3.1	0.22	1500	2.82	1.65	8.20	4970	2.07	589	34.0	0.111	0.86
St. Deviation	1.1	2.9	2.55	0.51	0.51	0.05	85	5800	0.041	0.3	7	0.161	0.0035	2.3	0.178	80	2.27	0.99	2.8	3250	0.45	174	19	0.004	0.58
# of values	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Minimum	31.9	17.2	5.28	0.463	6.77	0.047	336	2950	0.0448	0.448	19.9	0.0448	0.0895	1.47	0.0895	1440	1.21	0.949	6.29	2670	1.75	466	21.0	0.108	0.448
Maximum	33.5	21.3	8.89	1.19	7.49	0.120	456	11200	0.103	0.870	29.8	0.272	0.0945	4.72	0.341	1560	4.42	2.35	10.2	7260	2.39	712	47.9	0.113	1.27
% of values undetected				50%					50%	100%		50%	100%	100%	50%										50%
of values between MDL and MRL				1		1			1			1			1			1						2	1
TE21																									
Sample Date																									
08/28/04	46.1	7.95	17.6		10.1	**0.055**	368	2270	**0.0331**	**0.61**	10.5	**0.0331**	**0.066**	**7.02**	**0.066**	776	1.32	**0.665**	5.07	2390	1.39	325	12.9	**0.0438**	**0.331**
08/28/06	33.8	27.9	**1.89**	**0.458**	**1.57**	**0.015**	271	1440	**0.0458**	4.32	10.9	**0.0458**	**0.0915**	**1.22**	**0.0915**	1950	2.13	**0.719**	5.44	1560	2.12	849	12.1	**0.0756**	**0.458**
Mean	40.0	17.9	9.70	0.458	5.80	0.035	320	1860	0.0394	2.5	10.7	0.0394	0.0788	4.1	0.079	1360	1.73	0.692	5.26	1980	1.76	587	12.5	0.0597	0.394
Median	40.0	17.9	9.70	0.458	5.80	0.035	320	1860	0.0394	2.5	10.7	0.0394	0.0788	4.1	0.079	1360	1.73	0.692	5.26	1980	1.76	587	12.5	0.0597	0.394
St. Deviation	8.7	14.1	11.1	NA	6	0.029	69	590	0.0089	2.6	0.3	0.0089	0.018	4.1	0.018	830	0.57	0.038	0.26	590	0.52	371	0.6	0.0225	0.089
# of values	2	2	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Minimum	33.8	7.95	1.89	0.458	1.57	0.0145	271	1440	0.0331	0.61	10.5	0.0331	0.066	1.22	0.066	776	1.32	0.665	5.07	1560	1.39	325	12.1	0.0438	0.331
Maximum	46.1	27.9	17.6	0.458	10.1	0.055	368	2270	0.0458	4.32	10.9	0.0458	0.0915	7.02	0.0915	1950	2.13	0.719	5.44	2390	2.12	849	12.9	0.0756	0.458
% of values undetected				100%		100%			100%	50%		100%	100%		100%										100%
of values between MDL and MRL			1		1									2				2						2	

Appendix 35.1B. Soil Sample Results, Cook Inlet Drainages Study Area, 2004 and 2006

STATION	Nickel	Potassium	Selenium	Silver	Sodium	Thallium	Tin	Vanadium	Zinc
	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
TE18									
Sample Date									
08/18/04	6.95	2800	**0.45**	**0.058**	851	**0.0111**	**0.580**	93.9	39.4
08/29/06	4.72	2710	2.32	**0.0213**	662	0.109	**0.685**	62.9	35.9
Mean	5.84	2800	1.4	0.0396	757	0.060	0.63	78.4	37.7
Median	5.84	2800	1.4	0.0396	757	0.060	0.63	78.4	37.7
St. Deviation	1.58	100	1.3	0.026	134	0.069	0.07	21.9	2.5
# of values	2	2	2	2	2	2	2	2	2
Minimum	4.72	2710	0.45	0.0213	662	0.0111	0.580	62.9	35.9
Maximum	6.95	2800	2.32	0.058	851	0.109	0.685	93.9	39.4
% of values undetected				100%			100%		
of values between MDL and MRL			1			1			
TE19									
Sample Date									
08/18/04	4.87	360	1.05	1.03	368	**0.00535**	**0.86**	35.0	39
08/29/06	5.52	1040	4.24	**0.0442**	**279**	**0.0534**	**1.43**	29.5	106
Mean	5.20	700	2.65	0.54	324	0.0294	1.14	32.0	70
Median	5.20	700	2.65	0.54	324	0.0294	1.14	32.0	70
St. Deviation	0.46	500	2.26	0.7	63	0.034	0.4	4	50
# of values	2	2	2	2	2	2	2	2	2
Minimum	4.87	360	1.05	0.0442	279	0.00535	0.86	29.5	39
Maximum	5.52	1040	4.24	1.03	368	0.0534	1.43	35	106
% of values undetected				50%		50%	100%		
of values between MDL and MRL					1	1			
TE20									
Sample Date									
08/18/04	2.74	**203**	**1.01**	**0.0472**	401	**0.00945**	3.54	19.6	11.7
08/29/06	1.78	**257**	4.00	**0.0448**	365	**0.0285**	**1.45**	8.96	8.78
Mean	2.26	230	2.5	0.046	383	0.019	2.49	14.3	10.2
Median	2.26	230	2.5	0.046	383	0.019	2.49	14.3	10.2
St. Deviation	0.68	38	2.1	0.0017	25	0.0135	1.48	7.5	2.1
# of values	2	2	2.0	2.0	2	2	2	2	2
Minimum	1.78	203	1.01	0.0448	365	0.0095	1.45	8.96	8.78
Maximum	2.74	257	4	0.0472	401	0.0285	3.54	19.6	11.7
% of values undetected				100%		50%	50%		
of values between MDL and MRL		2	1			1			
TE21									
Sample Date									
08/28/04	**0.066**	251	**0.16**	**0.0331**	318	**0.0066**	**1.07**	7.28	5.92
08/28/06	1.87	387	11.0	**0.0458**	398	**0.0196**	**1.48**	**5.01**	7.93
Mean	1.00	319	6	0.0394	358	0.013	1.27	6.15	6.93
Median	1.00	319	6	0.0394	358	0.013	1.27	6.15	6.93
St. Deviation	1.3	96	8	0.0089	57	0.009	0.29	1.61	1.42
# of values	2	2	2	2	2	2	2	2	2
Minimum	0.066	251	0.16	0.0331	318	0.0066	1.07	5.01	5.92
Maximum	1.87	387	11.0	0.0458	398	0.020	1.48	7.28	7.93
% of values undetected	50%		50%	100%		50%	100%		
of values between MDL and MRL						1		1	

Appendix 35.1B. Soil Sample Results, Cook Inlet Drainages Study Area, 2004 and 2006

STATION	Total Solids	Organic Carbon	Chloride	Fluoride	Sulfate	Total Cyanide	Ammonia	Aluminum	Antimony	Arsenic	Barium	Beryllium	Bismuth	Boron	Cadmium	Calcium	Chromium	Cobalt	Copper	Iron	Lead	Magnesium	Manganese	Mercury	Molybdenum
	Wet	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
TE22																									
Sample Date																									
08/28/06	34.2	14.1	**0.454**	**0.454**	4.21	**0.053**	254	2580	**0.146**	5.53	21.8	**0.0451**	**0.090**	**1.67**	**0.278**	2420	3.43	1.73	10.2	5100	2.31	1020	34.8	**0.0735**	**0.451**
Mean	34.2	14.1	0.454	0.454	4.21	0.053	254	2580	0.146	5.53	21.8	0.0451	0.090	1.67	0.278	2420	3.43	1.73	10.2	5100	2.31	1020	34.8	0.0735	0.451
Median	34.2	14.1	0.454	0.454	4.21	0.053	254	2580	0.146	5.53	21.8	0.0451	0.090	1.67	0.278	2420	3.43	1.73	10.2	5100	2.31	1020	34.8	0.0735	0.451
St. Deviation	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
# of values	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Minimum	34.2	14.1	0.454	0.454	4.21	0.053	254	2580	0.146	5.53	21.8	0.0451	0.090	1.67	0.278	2420	3.43	1.73	10.2	5100	2.31	1020	34.8	0.0735	0.451
Maximum	34.2	14.1	0.454	0.454	4.21	0.053	254	2580	0.146	5.53	21.8	0.0451	0.090	1.67	0.278	2420	3.43	1.73	10.2	5100	2.31	1020	34.8	0.0735	0.451
% of values undetected			100%	100%								100%	100%												100%
of values between MDL and MRL						1			1					1	1									1	
TE23																									
Sample Date																									
08/29/06	72.8	2.24	**0.2125**	**0.2125**	3.31	0.087	115	16300	**0.0662**	12.3	58.2	0.152	**0.132**	3.38	0.453	4870	71.0	19.5	77.6	20600	7.37	12900	493	**0.0192**	**0.832**
Mean	72.8	2.24	0.2125	0.2125	3.31	0.087	115	16300	0.0662	12.3	58.2	0.152	0.132	3.38	0.453	4870	71	19.5	77.6	20600	7.37	12900	493	0.0192	0.832
Median	72.8	2.24	0.2125	0.2125	3.31	0.087	115	16300	0.0662	12.3	58.2	0.152	0.132	3.38	0.453	4870	71	19.5	77.6	20600	7.37	12900	493	0.0192	0.832
St. Deviation	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
# of values	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Minimum	72.8	2.24	0.2125	0.2125	3.31	0.087	115	16300	0.0662	12.3	58.2	0.152	0.132	3.38	0.453	4870	71	19.5	77.6	20600	7.37	12900	493	0.0192	0.832
Maximum	72.8	2.24	0.2125	0.2125	3.31	0.087	115	16300	0.0662	12.3	58.2	0.152	0.132	3.38	0.453	4870	71	19.5	77.6	20600	7.37	12900	493	0.0192	0.832
% of values undetected			100%	100%									100%												
of values between MDL and MRL									1															1	1
TE24																									
Sample Date																									
08/30/06	38.8	13.8	**0.399**	**0.399**	3.19	**0.047**	299	2810	**0.0795**	2.68	17.2	**0.0394**	**0.254**	**0.899**	**0.0785**	1000	2.54	1.31	6.15	5560	1.56	386	31.9	**0.0541**	**0.394**
Mean	38.8	13.8	0.399	0.399	3.19	0.047	299	2810	0.0795	2.68	17.2	0.0394	0.254	0.899	0.0785	1000	2.54	1.31	6.15	5560	1.56	386	31.9	0.0541	0.394
Median	38.8	13.8	0.399	0.399	3.19	0.047	299	2810	0.0795	2.68	17.2	0.0394	0.254	0.899	0.0785	1000	2.54	1.31	6.15	5560	1.56	386	31.9	0.0541	0.394
St. Deviation	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
# of values	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Minimum	38.8	13.8	0.399	0.399	3.19	0.047	299	2810	0.0795	2.68	17.2	0.0394	0.254	0.899	0.0785	1000	2.54	1.31	6.15	5560	1.56	386	31.9	0.0541	0.394
Maximum	38.8	13.8	0.399	0.399	3.19	0.047	299	2810	0.0795	2.68	17.2	0.0394	0.254	0.899	0.0785	1000	2.54	1.31	6.15	5560	1.56	386	31.9	0.0541	0.394
% of values undetected			100%	100%								100%	100%		100%										100%
of values between MDL and MRL						1			1					1										1	

Key: **Bold Results** = Parameter undetected by test, value shown is 1/2 MDL or 1/2 MRL.
If result was not detected at the lab MDL, the value shown is 1/2 MDL.
If result was validation flagged U or UJ, the value shown is 1/2 MRL.
Green Results= Estimated result reported by laboratory below reporting limit.
MDL = Method Detection Limit.
MRL = Method Reporting Limit.
NA = Not Applicable.
Note: All results reported on dry weight basis, except total solids reported on wet weight basis.

STATION	Nickel Dry	Potassium Dry	Selenium Dry	Silver Dry	Sodium Dry	Thallium Dry	Tin Dry	Vanadium Dry	Zinc Dry
TE22									
Sample Date									
08/28/06	2.84	434	11.5	**0.0451**	346	0.149	**1.46**	14.1	16.7
Mean	2.84	434	11.5	0.0451	346	0.149	1.46	14.1	16.7
Median	2.84	434	11.5	0.0451	346	0.149	1.46	14.1	16.7
St. Deviation	NA	NA	NA	NA	NA	NA	NA	NA	NA
# of values	1	1	1	1	1	1	1	1	1
Minimum	2.84	434	11.5	0.0451	346	0.149	1.46	14.1	16.7
Maximum	2.84	434	11.5	0.0451	346	0.149	1.46	14.1	16.7
% of values undetected				100%			100%		
of values between MDL and MRL									
TE23									
Sample Date									
08/29/06	32.8	697	3.07	**0.0205**	292	0.107	**0.66**	113	100
Mean	32.8	697	3.07	0.0205	292	0.107	0.66	113	100
Median	32.8	697	3.07	0.0205	292	0.107	0.66	113	100
St. Deviation	NA	NA	NA	NA	NA	NA	NA	NA	NA
# of values	1	1	1	1	1	1	1	1	1
Minimum	32.8	697	3.07	0.0205	292	0.107	0.66	113	100
Maximum	32.8	697	3.07	0.0205	292	0.107	0.66	113	100
% of values undetected				100%			100%		
of values between MDL and MRL									
TE24									
Sample Date									
08/30/06	1.55	257	7.03	**0.0394**	348	0.131	**1.27**	19.5	8.76
Mean	1.55	257	7.03	0.0394	348	0.131	1.27	19.5	8.76
Median	1.55	257	7.03	0.0394	348	0.131	1.27	19.5	8.76
St. Deviation	NA	NA	NA	NA	NA	NA	NA	NA	NA
# of values	1	1	1	1	1	1	1	1	1
Minimum	1.55	257	7.03	0.0394	348	0.131	1.27	19.5	8.76
Maximum	1.55	257	7.03	0.0394	348	0.131	1.27	19.5	8.76
% of values undetected				100%			100%		
of values between MDL and MRL									

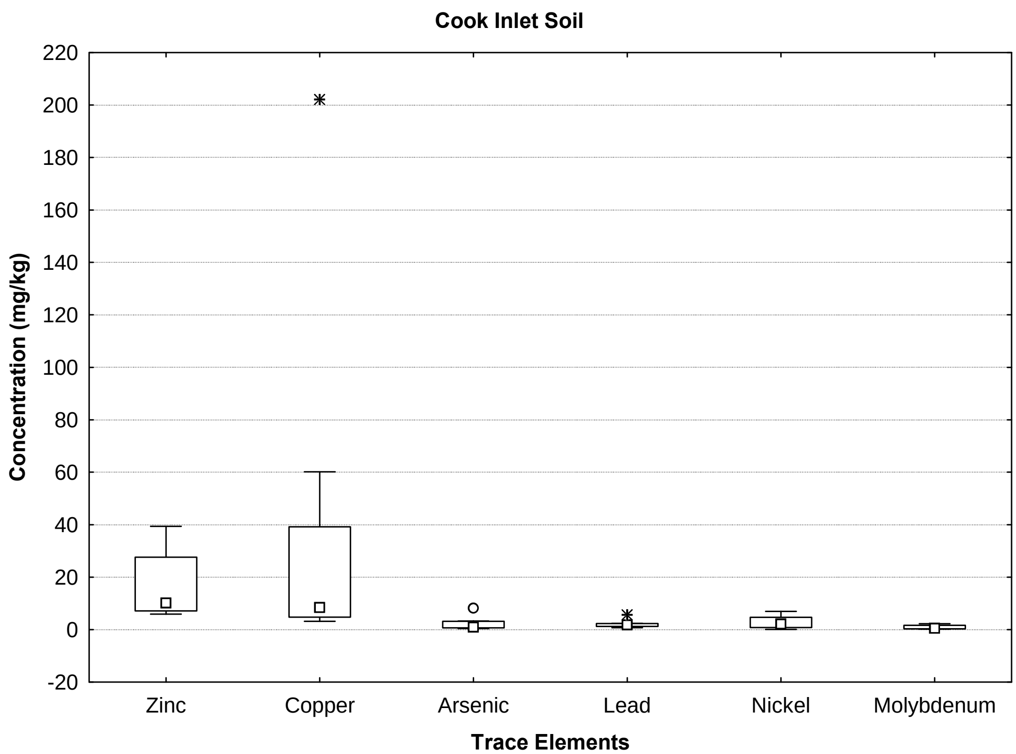
APPENDIX 35.1C

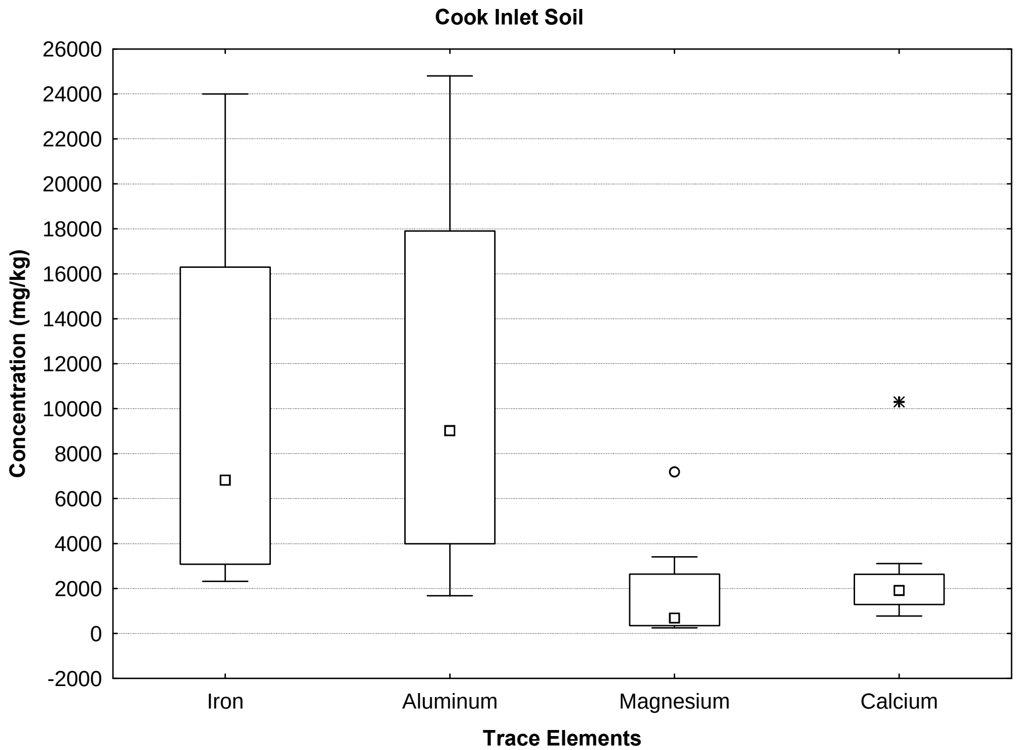
Box-and-Whisker Plots for Soil Data, Cook Inlet Drainages Study Area

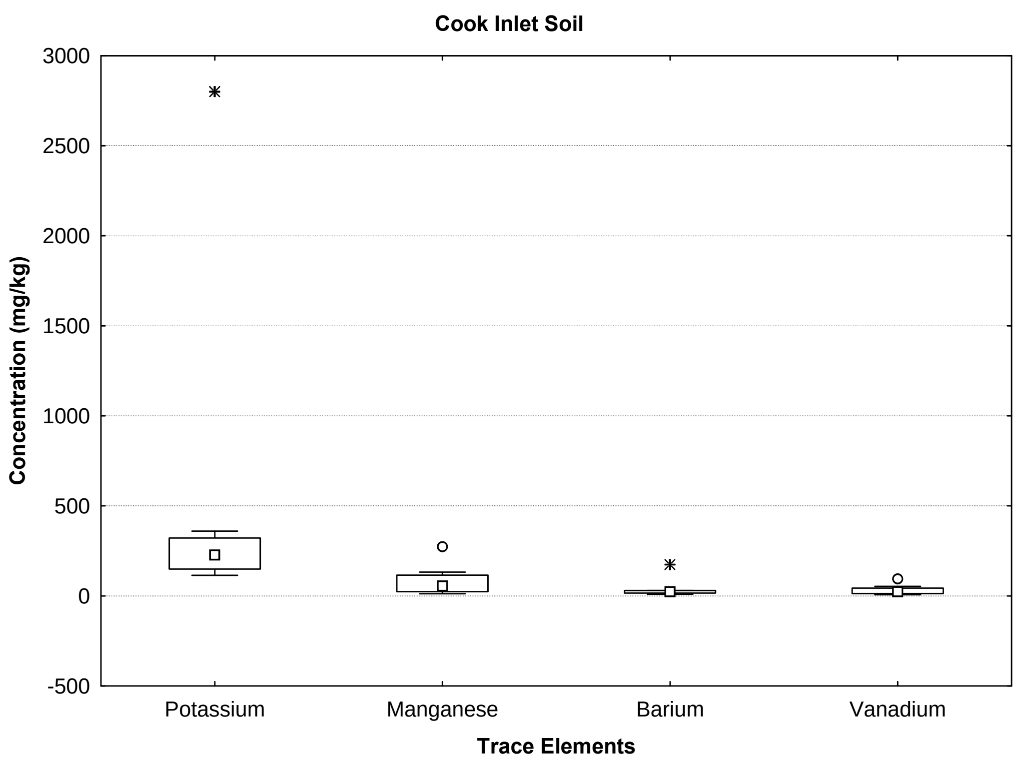
Box-and-Whisker Plots for Soil Data

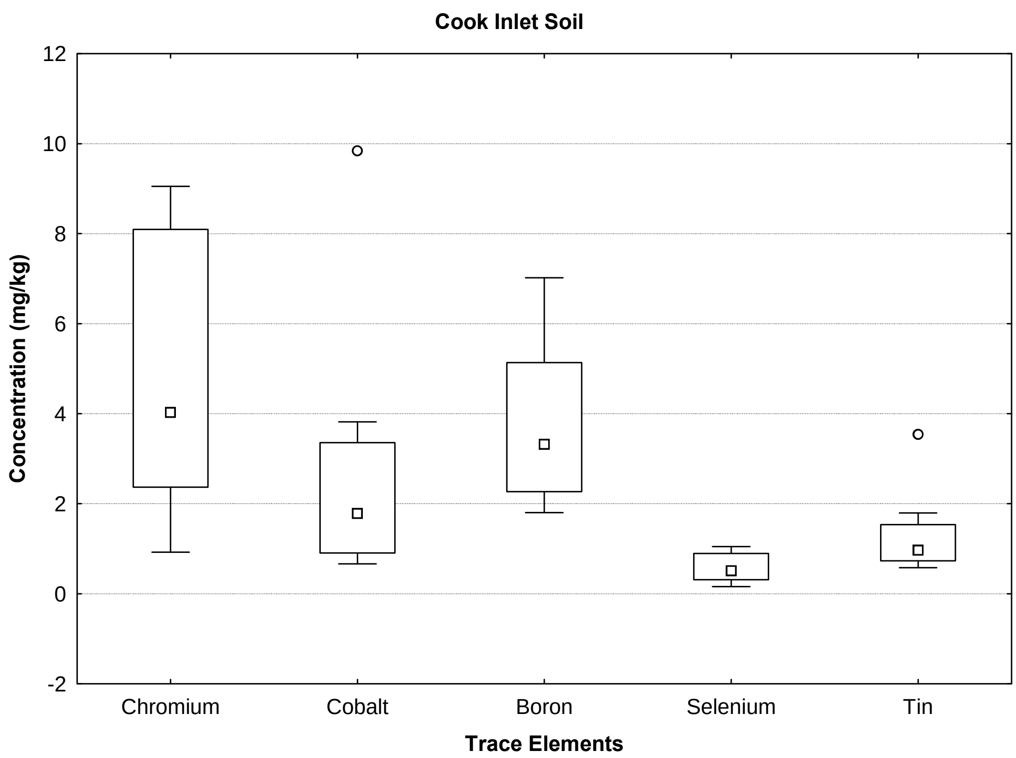
Boxplot Legend: This legend applies to all soil boxplots for the Cook Inlet drainages study area.

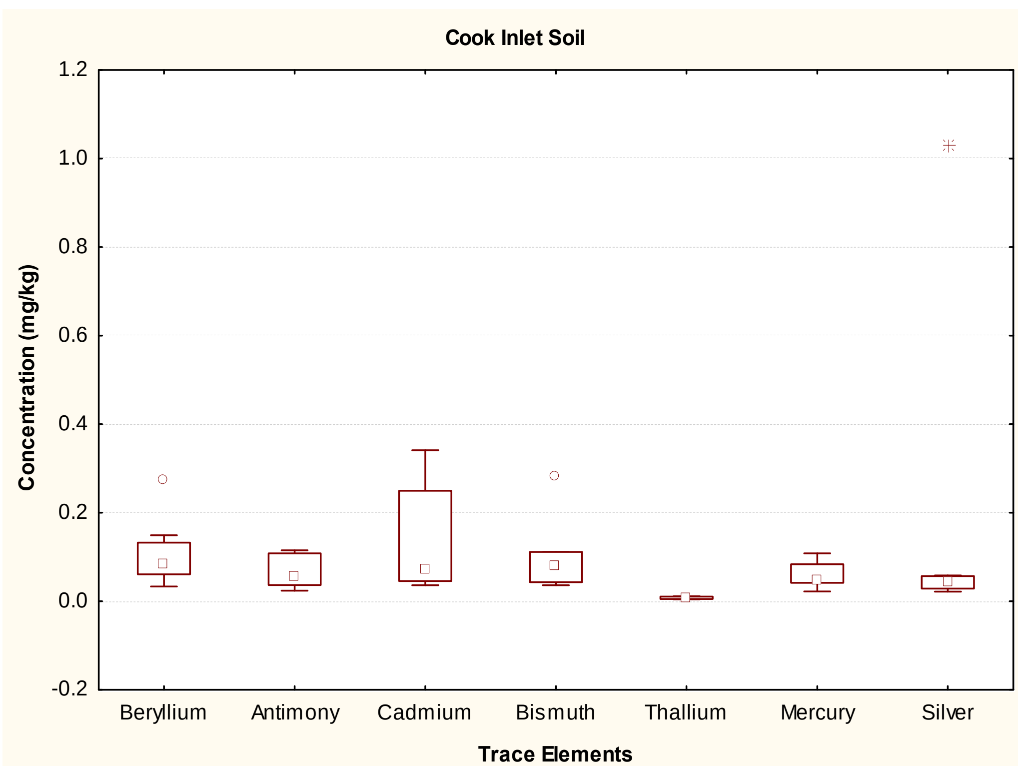
Median 25%-75% Non-outlier Range Outliers Extremes

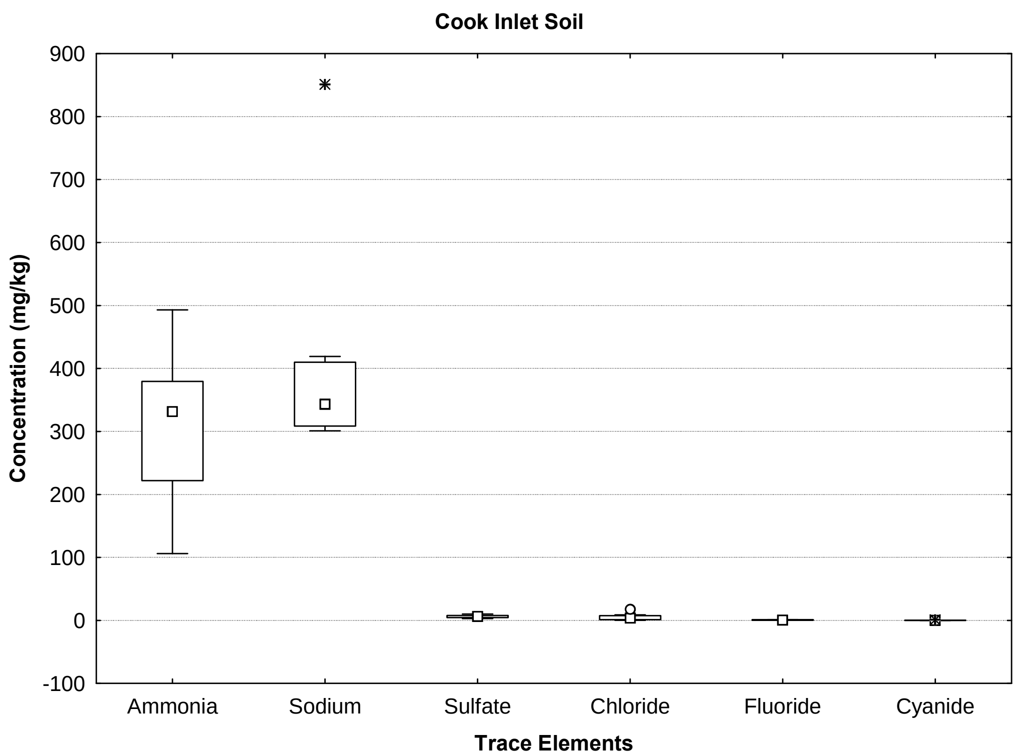



Cook Inlet Soil
26000
24000
22000
20000
18000
16000
14000
12000
10000
8000
6000
4000
2000
0
-2000
Concentration (mg/kg)
Iron
Aluminum
Magnesium
Calcium
Trace Elements


Cook Inlet Soil
3000
2500
2000
1500
1000
500
0
-500
Concentration (mg/kg)
Potassium
Manganese
Barium
Vanadium
Trace Elements


Cook Inlet Soil
Concentration (mg/kg)
12
10
8
6
4
2
0
-2
Chromium
Cobalt
Boron
Selenium
Tin
Trace Elements


Cook Inlet Soil
Concentration (mg/kg)
1.2
1.0
0.8
0.6
0.4
0.2
0.0
-0.2
Beryllium
Antimony
Cadmium
Bismuth
Thallium
Mercury
Silver
Trace Elements


Cook Inlet Soil
Concentration (mg/kg)
900
800
700
600
500
400
300
200
100
0
-100
Ammonia
Sodium
Sulfate
Chloride
Fluoride
Cyanide
Trace Elements

APPENDIX 35.1D

Vegetation Sample Results, Cook Inlet Drainages Study Areas, 2004 – 2007

Appendix 35.1D. Vegetation Sample Results, Cook Inlet Drainages Study Area, 2004-2007

	Total Solids	Chloride	Fluoride	Sulfate	Total Cyanide	Ammonia	Aluminum	Antimony	Arsenic	Barium	Beryllium	Bismuth	Boron	Cadmium	Calcium	Chromium	Cobalt
Species - Location ID	percent	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Alnus crispa-TE18																	
Sample Date																	
08/18/04	40.6	1520	12.0	897	**0.15**	44.8	318	**0.03**	**0.025**	3	**0.013**	**0.0035**	10.1	**0.0035**	4880	**0.4**	0.39
08/29/06	37.0				**0.055**		269	0.05	**0.03**	2.92	**0.013**	**0.025**	**8.6**	**0.01**	5260	**0.5**	0.313
09/14/07	39.6				**0.095**		178	**0.03**	**0.025**	4.1	**0.013**	**0.05**	**7.4**	**0.041**	6490	**0.35**	0.264
Mean	39.1	1520	12	897	0.1	44.8	255	0.037	0.027	3.3	0.013	0.026	8.7	0.018	5540	0.42	0.322
Median	39.6	1520	12	897	0.095	44.8	269	0.03	0.025	3	0.013	0.025	8.6	0.01	5260	0.4	0.313
St. Deviation	1.9	NA	NA	NA	0.05	NA	71	0.012	0.003	0.7	0	0.023	1.4	0.02	840	0.08	0.064
# of values	3	1	1	1	3	1	3	3	3	3	3	3	3	3	3	3	3
Minimum	37.0	1520	12	897	0.055	44.8	178	0.03	0.025	2.92	0.013	0.0035	7.4	0.0035	4880	0.35	0.264
Maximum	40.6	1520	12	897	0.15	44.8	318	0.05	0.03	4.1	0.013	0.05	10.1	0.041	6490	0.5	0.39
% of values undetected					100%				100%			100%		67%		67%	
# of values between MDL and MRL								2			3		2	1		1	
Alnus crispa-TE19																	
Sample Date																	
08/18/04	39.6	1380	14.8	1750	**0.15**	39.9	43.1	**0.04**	**0.025**	3.0	**0.006**	**0.0035**	21.8	**0.0035**	6240	**0.4**	0.51
08/29/06	43.1				**0.045**		23.1	0.11	**0.03**	5.23	**0.002**	**0.0245**	**16.9**	**0.01**	7710	**0.5**	0.165
09/14/07	40.3				**0.1**		61.6	**0.015**	**0.025**	5.98	0.026	**0.0025**	26.8	0.066	7150	**0.35**	2.46
Mean	41.0	1380	14.8	1750	0.1	39.9	42.6	0.06	0.027	4.74	0.011	0.01	21.8	0.027	7030	0.42	1.05
Median	40.3	1380	14.8	1750	0.1	39.9	43.1	0.04	0.025	5.23	0.006	0.0035	21.8	0.01	7150	0.4	0.51
St. Deviation	1.9	NA	NA	NA	0.05	NA	19.3	0.05	0.003	1.55	0.013	0.012	5	0.034	740	0.08	1.24
# of values	3	1	1	1	3	1	3	3	3	3	3	3	3	3	3	3	3
Minimum	39.6	1380	14.8	1750	0.045	39.9	23.1	0.015	0.025	3	0.002	0.0025	16.9	0.0035	6240	0.35	0.165
Maximum	43.1	1380	14.8	1750	0.15	39.9	61.6	0.11	0.03	5.98	0.026	0.0245	26.8	0.066	7710	0.5	2.46
% of values undetected					100%			33%	100%		33%	100%		67%		67%	
# of values between MDL and MRL								1			1		1			1	
Alnus crispa-TE20																	
Sample Date																	
08/18/04	41.8	2960	10.6	767	**0.15**	31.6	55.7	0.07	**0.025**	14.6	**0.009**	**0.0035**	21.5	**0.008**	6170	**0.4**	0.52
08/29/06	46.2				**0.045**		67.6	0.05	**0.025**	2.85	**0.01**	**0.028**	**15.7**	**0.01**	3020	**0.5**	0.119
09/14/07	39.2				**0.1**		63.7	**0.015**	**0.025**	5.67	**0.011**	**0.0025**	16	0.05	3690	**0.35**	0.197
Mean	42.4	2960	10.6	767	0.1	31.6	62.3	0.045	0.025	7.7	0.01	0.011	17.7	0.023	4290	0.42	0.279
Median	41.8	2960	10.6	767	0.1	31.6	63.7	0.05	0.025	5.67	0.01	0.0035	16	0.01	3690	0.4	0.197
St. Deviation	3.5	NA	NA	NA	0.05	NA	6.1	0.028	0	6.1	0.001	0.014	3.3	0.024	1660	0.08	0.213
# of values	3	1	1	1	3	1	3	3	3	3	3	3	3	3	3	3	3
Minimum	39.2	2960	10.6	767	0.045	31.6	55.7	0.015	0.025	2.85	0.009	0.0025	15.7	0.008	3020	0.35	0.119
Maximum	46.2	2960	10.6	767	0.15	31.6	67.6	0.07	0.025	14.6	0.011	0.028	21.5	0.05	6170	0.5	0.52
% of values undetected					100%			33%	100%		33%	67%		33%		67%	
# of values between MDL and MRL											2	1	1	1		1	

Appendix 35.1D. Vegetation Sample Results, Cook Inlet Drainages Study Area, 2004-2007

	Copper	Iron	Lead	Magnesium	Manganese	Mercury	Molybdenum	Nickel	Potassium	Selenium	Silver	Sodium	Thallium	Tin	Vanadium	Zinc
Species - Location ID	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Alnus crispa-TE18																
Sample Date																
08/18/04	8.84	113	0.09	1510	67.9	0.083	**0.02**	2.64	11200	**0.05**	**0.005**	85.7	**0.001**	**2.45**	0.22	25.7
08/29/06	6.86	84.6	0.15	1360	86.7	0.021	**0.01**	1.89	9780	**0.1**	**0.003**	112	**0.01**	**10.1**	**0.16**	25
09/14/07	8.2	67.5	0.53	1580	67.2	0.021	**0.025**	2.73	9390	**0.1**	**0.004**	193	**0.004**	**6**	0.23	43.1
Mean	7.97	88	0.26	1480	73.9	0.042	0.018	2.42	10100	0.08	0.004	130	0.005	6.2	0.2	31.3
Median	8.2	84.6	0.15	1510	67.9	0.021	0.02	2.64	9780	0.1	0.004	112	0.004	6	0.22	25.7
St. Deviation	1.01	23	0.24	110	11.1	0.036	0.008	0.46	1000	0.03	0.001	56	0.005	3.8	0.04	10.3
# of values	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Minimum	6.86	67.5	0.09	1360	67.2	0.021	0.01	1.89	9390	0.05	0.003	85.7	0.001	2.45	0.16	25
Maximum	8.84	113	0.53	1580	86.7	0.083	0.025	2.73	11200	0.1	0.005	193	0.01	10.1	0.23	43.1
% of values undetected							67%			100%	67%		67%	67%		
# of values between MDL and MRL							1				1		1	1	1	
Alnus crispa-TE19																
Sample Date																
08/18/04	8.1	85.6	0.11	3820	269	0.07	0.09	2.17	8510	**0.05**	**0.003**	189	**0.001**	**2.45**	**0.11**	44.8
08/29/06	4.26	62.3	0.06	2630	564	0.027	**0.01**	1.81	7100	**0.1**	**0.019**	125	**0.01**	**10**	0.22	49.7
09/14/07	15.1	48.2	0.69	1540	127	**0.011**	**0.025**	2.83	4410	**0.1**	**0.004**	385	**0.001**	**2.5**	**0.17**	30.3
Mean	9.2	65.4	0.29	2660	320	0.036	0.042	2.27	6670	0.08	0.009	233	0.004	5	0.17	41.6
Median	8.1	62.3	0.11	2630	269	0.027	0.025	2.17	7100	0.1	0.004	189	0.001	2.5	0.17	44.8
St. Deviation	5.5	18.9	0.35	1140	223	0.031	0.043	0.52	2080	0.03	0.009	135	0.005	4	0.06	10.1
# of values	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Minimum	4.26	48.2	0.06	1540	127	0.011	0.01	1.81	4410	0.05	0.003	125	0.001	2.45	0.11	30.3
Maximum	15.1	85.6	0.69	3820	564	0.07	0.09	2.83	8510	0.1	0.019	385	0.01	10	0.22	49.7
% of values undetected							67%			100%	33%		100%	100%		
# of values between MDL and MRL						1					2				2	
Alnus crispa-TE20																
Sample Date																
08/18/04	6.37	46.2	0.1	1630	130	0.085	0.73	3.26	8400	**0.05**	**0.003**	529	**0.001**	**2.5**	**0.18**	40.2
08/29/06	3.74	48.2	0.05	2260	306	0.024	0.07	1.63	9620	**0.05**	**0.003**	492	**0.01**	**10.1**	**0.04**	22
09/14/07	3.7	38.8	0.59	2190	224	**0.014**	**0.025**	1.43	8900	**0.1**	**0.004**	527	**0.001**	**5.4**	**0.14**	19.4
Mean	4.6	44.4	0.25	2030	220	0.041	0.28	2.11	9000	0.07	0.0033	516	0.004	6	0.12	27.2
Median	3.74	46.2	0.1	2190	224	0.024	0.07	1.63	8900	0.05	0.003	527	0.001	5.4	0.14	22
St. Deviation	1.53	5	0.3	350	88	0.038	0.39	1	600	0.03	0.0006	21	0.005	4	0.07	11.3
# of values	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Minimum	3.7	38.8	0.05	1630	130	0.014	0.025	1.43	8400	0.05	0.003	492	0.001	2.5	0.04	19.4
Maximum	6.37	48.2	0.59	2260	306	0.085	0.73	3.26	9620	0.1	0.004	529	0.01	10.1	0.18	40.2
% of values undetected							33%			100%	67%		100%	67%		
# of values between MDL and MRL						1					1			1	3	

Appendix 35.1D. Vegetation Sample Results, Cook Inlet Drainages Study Area, 2004-2007

	Total Solids	Chloride	Fluoride	Sulfate	Total Cyanide	Ammonia	Aluminum	Antimony	Arsenic	Barium	Beryllium	Bismuth	Boron	Cadmium	Calcium	Chromium	Cobalt
Species - Location ID	percent	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Alnus crispa-TE21																	
Sample Date																	
08/28/04	37	4610	**0.4**	288	**0.7**	36	94.7	**0.025**	**0.025**	0.9	**0.004**	**0.0035**	30.5	**0.019**	3140	**0.4**	0.32
08/28/06	45.7				**0.045**		52.2	**0.04**	**0.025**	1.72	**0.01**	**0.0015**	**13**	**0.01**	3190	**0.5**	0.16
09/13/07	45.6				**0.08**		78.2	0.07	**0.06**	2.58	**0.003**	**0.0025**	13.6	**0.01**	3840	**0.35**	0.543
Mean	42.8	4610	0.4	288	0.28	36	75	0.045	0.037	1.73	0.006	0.0025	19	0.013	3390	0.42	0.34
Median	45.6	4610	0.4	288	0.08	36	78.2	0.04	0.025	1.72	0.004	0.0025	13.6	0.01	3190	0.4	0.32
St. Deviation	5	NA	NA	NA	0.37	NA	21.4	0.023	0.02	0.84	0.004	0.001	9.9	0.005	390	0.08	0.19
# of values	3	1	1	1	3	1	3	3	3	3	3	3	3	3	3	3	3
Minimum	37	4610	0.4	288	0.045	36	52.2	0.025	0.025	0.9	0.003	0.0015	13	0.01	3140	0.35	0.16
Maximum	45.7	4610	0.4	288	0.7	36	94.7	0.07	0.06	2.58	0.01	0.0035	30.5	0.019	3840	0.5	0.543
% of values undetected					100%			33%	67%		67%	100%		33%		67%	
# of values between MDL and MRL			1					1	1		1		1	2		1	
Alnus crispa-TE22																	
Sample Date																	
08/29/04	42.3	2850	**0.2**	1400	**0.7**	102	199	0.14	**0.025**	2.3	**0.008**	**0.0035**	21.6	**0.0035**	4120	**0.4**	0.6
08/28/06	47				**0.11**		73.7	0.07	**0.025**	1.62	**0.01**	**0.033**	**11**	**0.01**	2780	**0.5**	0.228
09/13/07	43.9				**0.43**		77.6	0.11	**0.05**	1.48	**0.003**	**0.0025**	18.5	**0.003**	2730	**0.9**	0.315
Mean	44.4	2850	0.2	1400	0.41	102	117	0.11	0.033	1.8	0.007	0.013	17	0.006	3210	0.6	0.381
Median	43.9	2850	0.2	1400	0.43	102	77.6	0.11	0.025	1.62	0.008	0.0035	18.5	0.0035	2780	0.5	0.315
St. Deviation	2.4	NA	NA	NA	0.3	NA	71	0.04	0.014	0.44	0.004	0.017	5.5	0.004	790	0.26	0.195
# of values	3	1	1	1	3	1	3	3	3	3	3	3	3	3	3	3	3
Minimum	42.3	2850	0.2	1400	0.11	102	73.7	0.07	0.025	1.48	0.003	0.0025	11	0.003	2730	0.4	0.228
Maximum	47	2850	0.2	1400	0.7	102	199	0.14	0.05	2.3	0.01	0.033	21.6	0.01	4120	0.9	0.6
% of values undetected			100%		33%				67%		67%	67%		100%		33%	
# of values between MDL and MRL					2				1		1	1	1			2	
Alnus crispa-TE23																	
Sample Date																	
08/29/06	41.8				**0.26**		34.2	**0.02**	**0.025**	9.14	**0.01**	**0.0015**	**17**	**0.045**	6740	**0.5**	0.35
09/13/07	42.1				**0.105**		33.2	0.05	**0.13**	9.87	**0.003**	**0.0025**	18.5	0.064	7260	**0.35**	0.394
Mean	42.0				0.18		33.7	0.035	0.08	9.51	0.007	0.002	18	0.055	7000	0.4	0.37
Median	42.0				0.18		33.7	0.035	0.08	9.51	0.007	0.002	18	0.055	7000	0.4	0.37
St. Deviation	0.2				0.11		0.7	0.021	0.07	0.52	0.005	0.0007	1	0.013	370	0.1	0.03
# of values	2	0	0	0	2	0	2	2	2	2	2	2	2	2	2	2	2
Minimum	41.8	0	0	0	0.105	0	33.2	0.02	0.025	9.14	0.003	0.0015	17	0.045	6740	0.35	0.35
Maximum	42.1	0	0	0	0.26	0	34.2	0.05	0.13	9.87	0.01	0.0025	18.5	0.064	7260	0.5	0.394
% of values undetected					50%			50%	50%		100%	100%				100%	
# of values between MDL and MRL					1				1				1	1			

Appendix 35.1D. Vegetation Sample Results, Cook Inlet Drainages Study Area, 2004-2007

	Copper	Iron	Lead	Magnesium	Manganese	Mercury	Molybdenum	Nickel	Potassium	Selenium	Silver	Sodium	Thallium	Tin	Vanadium	Zinc
Species - Location ID	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Alnus crispa-TE21																
Sample Date																
08/28/04	4.74	83.7	0.16	2690	94	0.062	**0.025**	4.16	8580	**0.05**	**0.0015**	1510	**0.005**	**2.5**	0.2	31.2
08/28/06	5.4	43.3	0.08	2450	321	0.029	**0.025**	1.52	8390	**0.05**	**0.003**	226	**0.01**	**9.85**	**0.04**	39.6
09/13/07	4.61	47.7	0.15	2430	76.8	0.03	0.13	2.51	4610	**0.1**	**0.004**	420	**0.001**	**2.5**	**0.19**	21.1
Mean	4.92	58.2	0.13	2520	164	0.04	0.06	2.73	7190	0.07	0.0028	720	0.005	5	0.14	30.6
Median	4.74	47.7	0.15	2450	94	0.03	0.025	2.51	8390	0.05	0.003	420	0.005	2.5	0.19	31.2
St. Deviation	0.42	22.2	0.04	140	136	0.019	0.06	1.33	2240	0.03	0.0013	690	0.005	4.2	0.09	9.3
# of values	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Minimum	4.61	43.3	0.08	2430	76.8	0.029	0.025	1.52	4610	0.05	0.0015	226	0.001	2.5	0.04	21.1
Maximum	5.4	83.7	0.16	2690	321	0.062	0.13	4.16	8580	0.1	0.004	1510	0.01	9.85	0.2	39.6
% of values undetected							67%			100%	100%		67%	100%		
# of values between MDL and MRL													1		2	
Alnus crispa-TE22																
Sample Date																
08/29/04	4.91	52.7	0.1	3240	70.6	0.073	**0.025**	3.3	8230	**0.05**	**0.011**	313	**0.001**	**2.5**	**0.18**	20.3
08/28/06	4.86	46.4	0.08	2070	118	0.025	**0.025**	1.62	6970	**0.05**	1.18	283	**0.01**	**4.8**	**0.03**	18.1
09/13/07	4	43.6	0.12	2170	24	0.047	0.11	1.37	7810	**0.1**	**0.004**	505	**0.001**	**2.5**	**0.18**	14.8
Mean	4.59	47.6	0.1	2490	71	0.048	0.05	2.1	7670	0.07	0.4	367	0.004	3.3	0.13	17.7
Median	4.86	46.4	0.1	2170	70.6	0.047	0.025	1.62	7810	0.05	0.011	313	0.001	2.5	0.18	18.1
St. Deviation	0.51	4.7	0.02	650	47	0.024	0.05	1.05	640	0.03	0.7	120	0.005	1.3	0.09	2.8
# of values	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Minimum	4	43.6	0.08	2070	24	0.025	0.025	1.37	6970	0.05	0.004	283	0.001	2.5	0.03	14.8
Maximum	4.91	52.7	0.12	3240	118	0.073	0.11	3.3	8230	0.1	1.18	505	0.01	4.8	0.18	20.3
% of values undetected							67%			100%	33%		100%	67%		
# of values between MDL and MRL											1			1	3	
Alnus crispa-TE23																
Sample Date																
08/29/06	6.59	57.2	0.05	1350	167	0.024	**0.025**	2.86	10100	**0.05**	**0.003**	33.4	**0.01**	**4.7**	**0.01**	33.7
09/13/07	5.67	40.8	0.08	1440	180	0.023	0.07	2.31	8030	**0.1**	**0.004**	71	**0.001**	**2.5**	**0.1**	31.8
Mean	6.13	49	0.065	1400	174	0.024	0.05	2.59	9100	0.08	0.0035	52	0.006	3.6	0.06	32.8
Median	6.13	49	0.065	1400	174	0.024	0.05	2.59	9100	0.08	0.0035	52	0.006	3.6	0.06	32.8
St. Deviation	0.65	11.6	0.021	60	9	0.001	0.03	0.39	1500	0.04	0.0007	27	0.006	1.6	0.06	1.3
# of values	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Minimum	5.67	40.8	0.05	1350	167	0.023	0.025	2.31	8030	0.05	0.003	33.4	0.001	2.5	0.01	31.8
Maximum	6.59	57.2	0.08	1440	180	0.024	0.07	2.86	10100	0.1	0.004	71	0.01	4.7	0.1	33.7
% of values undetected							50%			100%	100%		100%	50%	50%	
# of values between MDL and MRL														1	1	

Appendix 35.1D. Vegetation Sample Results, Cook Inlet Drainages Study Area, 2004-2007

	Total Solids	Chloride	Fluoride	Sulfate	Total Cyanide	Ammonia	Aluminum	Antimony	Arsenic	Barium	Beryllium	Bismuth	Boron	Cadmium	Calcium	Chromium	Cobalt
Species - Location ID	percent	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Alnus crispa-TE24																	
Sample Date																	
08/30/06	32.4				0.8		69.1	**0.02**	**0.025**	2.1	**0.01**	**0.004**	**10.2**	**0.01**	1830	**0.5**	0.072
09/13/07	39.2				**0.09**		61	**0.03**	**0.025**	3.03	**0.006**	**0.0025**	**8.2**	**0.003**	2750	**0.35**	0.254
Mean	35.8				0.45		65	0.025	0.025	2.6	0.008	0.003	9	0.007	2290	0.4	0.16
Median	35.8				0.45		65	0.025	0.025	2.6	0.008	0.003	9	0.007	2290	0.4	0.16
St. Deviation	4.8				0.5		6	0.007	0	0.7	0.003	0.001	1	0.005	650	0.1	0.13
# of values	2	0	0	0	2	0	2	2	2	2	2	2	2	2	2	2	2
Minimum	32.4	0	0	0	0.09	0	61	0.02	0.025	2.1	0.006	0.0025	8.2	0.003	1830	0.35	0.072
Maximum	39.2	0	0	0	0.8	0	69.1	0.03	0.025	3.03	0.01	0.004	10.2	0.01	2750	0.5	0.254
% of values undetected					50%			50%	100%		50%	50%		100%		100%	
# of values between MDL and MRL								1			1	1	2				
Angelica genuflexa-TE19																	
Sample Date																	
08/29/06	22.2				**0.09**		34.3	**0.02**	**0.08**	2.46	**0.004**	**0.025**	50.3	**0.01**	17700	**0.5**	0.117
09/14/07	18.5				1.9		30.1	**0.015**	**0.025**	2.9	**0.003**	**0.0025**	28.3	0.095	13800	**0.35**	1.42
Mean	20.4				1		32.2	0.02	0.05	2.7	0.0035	0.014	39.3	0.05	15800	0.4	0.77
Median	20.4				1		32.2	0.02	0.05	2.7	0.0035	0.014	39.3	0.05	15800	0.4	0.77
St. Deviation	2.6				1		3	0	0.04	0.3	0.0007	0.016	15.6	0.06	2800	0.1	0.92
# of values	2	0	0	0	2	0	2	2	2	2	2	2	2	2	2	2	2
Minimum	18.5	0	0	0	0.09	0	30.1	0.015	0.025	2.46	0.003	0.0025	28.3	0.01	13800	0.35	0.117
Maximum	22.2	0	0	0	1.9	0	34.3	0.02	0.08	2.9	0.004	0.025	50.3	0.095	17700	0.5	1.42
% of values undetected					50%			100%	50%		50%	100%		50%		100%	
# of values between MDL and MRL									1		1						
Angelica genuflexa-TE20																	
Sample Date																	
08/18/04	18.1	3950	14.2	2040	**0.15**	960	19.5	**0.01**	**0.05**	1.2	**0.0015**	**0.0035**	51.1	**0.014**	6280	**0.1**	0.25
Mean	18.1	3950	14.2	2040	0.15	960	19.5	0.01	0.05	1.2	0.0015	0.0035	51.1	0.014	6280	0.1	0.25
Median	18.1	3950	14.2	2040	0.15	960	19.5	0.01	0.05	1.2	0.0015	0.0035	51.1	0.014	6280	0.1	0.25
St. Deviation	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
# of values	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Minimum	18.1	3950	14.2	2040	0.15	960	19.5	0.01	0.05	1.2	0.0015	0.0035	51.1	0.014	6280	0.1	0.25
Maximum	18.1	3950	14.2	2040	0.15	960	19.5	0.01	0.05	1.2	0.0015	0.0035	51.1	0.014	6280	0.1	0.25
% of values undetected					100%			100%			100%	100%				100%	
# of values between MDL and MRL									1					1			

Appendix 35.1D. Vegetation Sample Results, Cook Inlet Drainages Study Area, 2004-2007

	Copper	Iron	Lead	Magnesium	Manganese	Mercury	Molybdenum	Nickel	Potassium	Selenium	Silver	Sodium	Thallium	Tin	Vanadium	Zinc
Species - Location ID	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Alnus crispa-TE24																
Sample Date																
08/30/06	5.75	46.9	0.09	1220	149	0.055	**0.03**	0.85	8200	**0.05**	**0.003**	68.8	**0.01**	**1.5**	**0.03**	24.4
09/13/07	4.13	41.9	0.12	968	191	0.041	**0.025**	0.7	7980	**0.1**	**0.004**	82.4	**0.003**	**2.5**	**0.06**	21.8
Mean	4.94	44.4	0.1	1090	170	0.048	0.03	0.8	8090	0.08	0.0035	75.6	0.007	2	0.045	23.1
Median	4.94	44.4	0.1	1090	170	0.048	0.03	0.8	8090	0.08	0.0035	75.6	0.007	2	0.045	23.1
St. Deviation	1.15	3.5	0	180	30	0.01	0	0.1	160	0.04	0.0007	9.6	0.005	0.7	0.021	1.8
# of values	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Minimum	4.13	41.9	0.09	968	149	0.041	0.025	0.7	7980	0.05	0.003	68.8	0.003	1.5	0.03	21.8
Maximum	5.75	46.9	0.12	1220	191	0.055	0.03	0.85	8200	0.1	0.004	82.4	0.01	2.5	0.06	24.4
% of values undetected							50%			100%	100%		50%	100%		
# of values between MDL and MRL							1						1		2	
Angelica genuflexa-TE19																
Sample Date																
08/29/06	5.42	51.8	0.05	6850	105	0.026	0.51	2.57	22200	**0.1**	**0.003**	2340	**0.01**	**9.85**	**0.12**	41.2
09/14/07	7.6	61.5	0.38	3260	263	**0.019**	0.67	4.18	19500	**0.1**	**0.004**	4530	**0.003**	**2.55**	**0.16**	86.8
Mean	6.5	56.7	0.2	5060	184	0.023	0.59	3.38	20900	0.1	0.0035	3440	0.007	6.2	0.14	64
Median	6.5	56.7	0.2	5060	184	0.023	0.59	3.38	20900	0.1	0.0035	3440	0.007	6.2	0.14	64
St. Deviation	1.5	6.9	0.2	2540	112	0.005	0.11	1.14	1900	0	0.0007	1550	0.005	5.16	0.03	32.2
# of values	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Minimum	5.42	51.8	0.05	3260	105	0.019	0.51	2.57	19500	0.1	0.003	2340	0.003	2.55	0.12	41.2
Maximum	7.6	61.5	0.38	6850	263	0.026	0.67	4.18	22200	0.1	0.004	4530	0.01	9.85	0.16	86.8
% of values undetected										100%	100%		50%	100%		
# of values between MDL and MRL						1							1		2	
Angelica genuflexa-TE20																
Sample Date																
08/18/04	10.6	46.5	**0.03**	5970	69.9	0.078	0.55	2.34	32000	**0.05**	**0.002**	3120	**0.001**	**2.45**	**0.07**	37.5
Mean	10.6	46.5	0.03	5970	69.9	0.078	0.55	2.34	32000	0.05	0.002	3120	0.001	2.45	0.07	37.5
Median	10.6	46.5	0.03	5970	69.9	0.078	0.55	2.34	32000	0.05	0.002	3120	0.001	2.45	0.07	37.5
St. Deviation	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
# of values	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Minimum	10.6	46.5	0.03	5970	69.9	0.078	0.55	2.34	32000	0.05	0.002	3120	0.001	2.45	0.07	37.5
Maximum	10.6	46.5	0.03	5970	69.9	0.078	0.55	2.34	32000	0.05	0.002	3120	0.001	2.45	0.07	37.5
% of values undetected										100%	100%		100%	100%		
# of values between MDL and MRL			1												1	

Appendix 35.1D. Vegetation Sample Results, Cook Inlet Drainages Study Area, 2004-2007

	Total Solids	Chloride	Fluoride	Sulfate	Total Cyanide	Ammonia	Aluminum	Antimony	Arsenic	Barium	Beryllium	Bismuth	Boron	Cadmium	Calcium	Chromium	Cobalt
Species - Location ID	percent	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Artemisia tilesii-TE23																	
Sample Date																	
08/29/06	21.6				2.0		29.1	0.05	**0.06**	12.5	**0.0095**	**0.0015**	23.4	1.45	11100	**0.5**	0.121
09/13/07	21.3				**0.38**		56.2	**0.04**	**0.13**	20	**0.003**	**0.0025**	25.5	2.15	18100	**0.35**	0.168
Mean	21.5				1		42.7	0.045	0.1	16	0.006	0.002	24.5	1.8	14600	0.4	0.145
Median	21.5				1		42.7	0.045	0.1	16	0.006	0.002	24.5	1.8	14600	0.4	0.145
St. Deviation	0.2				1		19.2	0.007	0	5	0.005	0.0007	1.5	0.49	4900	0.1	0.033
# of values	2	0	0	0	2	0	2	2	2	2	2	2	2	2	2	2	2
Minimum	21.3	0	0	0	0.38	0	29.1	0.04	0.06	12.5	0.003	0.0015	23.4	1.45	11100	0.35	0.121
Maximum	21.6	0	0	0	2	0	56.2	0.05	0.13	20	0.0095	0.0025	25.5	2.15	18100	0.5	0.168
% of values undetected											100%	100%				100%	
# of values between MDL and MRL					1			1	2								
Athyrium filix-femina-TE18																	
Sample Date																	
08/18/04	27.9	2710	13.2	2350	**0.15**	533	210	**0.01**	**0.025**	39.6	**0.007**	**0.0035**	15.5	**0.033**	4780	**0.1**	0.27
08/29/06	29.1				**0.35**		197	0.05	**0.03**	37.1	**0.007**	**0.0015**	**17.7**	**0.022**	5410	3	0.225
09/14/07	21				**0.18**		207	**0.04**	**0.025**	61.6	**0.007**	**0.05**	22	0.051	6170	**0.35**	0.25
Mean	26.0	2710	13.2	2350	0.23	533	205	0.033	0.027	46.1	0.007	0.018	18.4	0.035	5450	1.2	0.25
Median	27.9	2710	13.2	2350	0.18	533	207	0.04	0.025	39.6	0.007	0.0035	17.7	0.033	5410	0.35	0.25
St. Deviation	4.4	NA	NA	NA	0.11	NA	7	0.021	0.003	13.5	0	0.027	3.3	0.015	700	1.6	0.02
# of values	3	1	1	1	3	1	3	3	3	3	3	3	3	3	3	3	3
Minimum	21	2710	13.2	2350	0.15	533	197	0.01	0.025	37.1	0.007	0.0015	15.5	0.022	4780	0.1	0.225
Maximum	29.1	2710	13.2	2350	0.35	533	210	0.05	0.03	61.6	0.007	0.05	22	0.051	6170	3	0.27
% of values undetected					100%			33%	100%			100%				67%	
# of values between MDL and MRL								1			3		1	2			
Athyrium filix-femina-TE23																	
Sample Date																	
09/13/07	25.5				87		127	**0.03**	**0.36**	262	**0.003**	**0.0025**	22.5	0.226	7710	**0.35**	0.059
Mean	25.5				87		127	0.03	0.36	262	0.003	0.0025	22.5	0.226	7710	0.35	0.059
Median	25.5				87		127	0.03	0.36	262	0.003	0.0025	22.5	0.226	7710	0.35	0.059
St. Deviation	NA				NA		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
# of values	1	0	0	0	1	0	1	1	1	1	1	1	1	1	1	1	1
Minimum	25.5	0	0	0	87	0	127	0.03	0.36	262	0.003	0.0025	22.5	0.226	7710	0.35	0.059
Maximum	25.5	0	0	0	87	0	127	0.03	0.36	262	0.003	0.0025	22.5	0.226	7710	0.35	0.059
% of values undetected											100%	100%				100%	
# of values between MDL and MRL								1	1								

Appendix 35.1D. Vegetation Sample Results, Cook Inlet Drainages Study Area, 2004-2007

	Copper	Iron	Lead	Magnesium	Manganese	Mercury	Molybdenum	Nickel	Potassium	Selenium	Silver	Sodium	Thallium	Tin	Vanadium	Zinc
Species - Location ID	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Artemisia tilesii-TE23																
Sample Date																
08/29/06	18.3	52.1	0.11	2360	107	**0.012**	0.82	4.19	30000	**0.3**	**0.003**	239	**0.01**	**1.5**	**0.03**	68.4
09/13/07	13.7	50.3	0.29	3200	175	0.036	0.77	2.78	20200	**0.3**	**0.004**	1630	**0.005**	**2.5**	**0.1**	90.3
Mean	16	51.2	0.2	2780	141	0.024	0.8	3.49	25000	0.3	0.0035	930	0.008	2	0.07	79.4
Median	16	51.2	0.2	2780	141	0.024	0.8	3.49	25000	0.3	0.0035	930	0.008	2	0.07	79.4
St. Deviation	3.3	1.3	0.13	590	48	0.017	0.04	1	7000	0	0.0007	980	0.004	0.7	0.05	15.5
# of values	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Minimum	13.7	50.3	0.11	2360	107	0.012	0.77	2.78	20200	0.3	0.003	239	0.005	1.5	0.03	68.4
Maximum	18.3	52.1	0.29	3200	175	0.036	0.82	4.19	30000	0.3	0.004	1630	0.01	2.5	0.1	90.3
% of values undetected											100%		50%	100%		
# of values between MDL and MRL						1				2			1		2	
Athyrium filix-femina-TE18																
Sample Date																
08/18/04	6.49	69	0.13	4950	609	0.098	**0.03**	1.67	15300	**0.05**	**0.002**	595	**0.001**	**2.5**	0.24	53.4
08/29/06	5.11	73	0.15	4670	382	0.047	**0.02**	2.14	18300	**0.1**	**0.003**	436	**0.01**	**10.05**	**0.19**	49.4
09/14/07	5.3	69.7	0.73	5780	468	0.069	0.06	1.53	19100	**0.1**	**0.004**	377	**0.005**	**2.5**	**0.19**	59.1
Mean	5.63	71	0.34	5130	486	0.071	0.037	1.78	17600	0.08	0.003	469	0.005	5	0.21	54
Median	5.3	69.7	0.15	4950	468	0.069	0.03	1.67	18300	0.1	0.003	436	0.005	2.5	0.19	53.4
St. Deviation	0.75	2	0.34	580	115	0.026	0.021	0.32	2000	0.03	0.001	113	0.005	4	0.03	4.9
# of values	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Minimum	5.11	69	0.13	4670	382	0.047	0.02	1.53	15300	0.05	0.002	377	0.001	2.5	0.19	49.4
Maximum	6.49	73	0.73	5780	609	0.098	0.06	2.14	19100	0.1	0.004	595	0.01	10.05	0.24	59.1
% of values undetected										100%	100%		67%	100%		
# of values between MDL and MRL							2						1		2	
Athyrium filix-femina-TE23																
Sample Date																
09/13/07	6.08	71.5	0.07	3390	109	0.033	0.32	2.39	23700	**0.4**	0.027	178	0.032	**5.4**	0.68	21.8
Mean	6.08	71.5	0.07	3390	109	0.033	0.32	2.39	23700	0.4	0.027	178	0.032	5.4	0.68	21.8
Median	6.08	71.5	0.07	3390	109	0.033	0.32	2.39	23700	0.4	0.027	178	0.032	5.4	0.68	21.8
St. Deviation	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
# of values	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Minimum	6.08	71.5	0.07	3390	109	0.033	0.32	2.39	23700	0.4	0.027	178	0.032	5.4	0.68	21.8
Maximum	6.08	71.5	0.07	3390	109	0.033	0.32	2.39	23700	0.4	0.027	178	0.032	5.4	0.68	21.8
% of values undetected																
# of values between MDL and MRL										1				1		

Appendix 35.1D. Vegetation Sample Results, Cook Inlet Drainages Study Area, 2004-2007

	Total Solids	Chloride	Fluoride	Sulfate	Total Cyanide	Ammonia	Aluminum	Antimony	Arsenic	Barium	Beryllium	Bismuth	Boron	Cadmium	Calcium	Chromium	Cobalt
Species - Location ID	percent	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Athyrium filix-femina-TE24																	
Sample Date																	
08/30/06	20.2				**0.87**		206	**0.02**	**0.025**	23.3	**0.01**	**0.0015**	**17.3**	0.079	3480	**0.5**	0.073
09/13/07	26.4				**0.14**		108	**0.03**	**0.025**	79.2	**0.003**	**0.0025**	22.3	0.084	6360	**0.35**	0.107
Mean	23.3				0.51		157	0.025	0.025	51.3	0.007	0.002	19.8	0.082	4920	0.4	0.09
Median	23.3				0.51		157	0.025	0.025	51.3	0.007	0.002	19.8	0.082	4920	0.4	0.09
St. Deviation	4.4				0.52		69	0.007	0	39.5	0.005	0.0007	3.5	0.004	2040	0.1	0.02
# of values	2	0	0	0	2	0	2	2	2	2	2	2	2	2	2	2	2
Minimum	20.2	0	0	0	0.14	0	108	0.02	0.025	23.3	0.003	0.0015	17.3	0.079	3480	0.35	0.073
Maximum	26.4	0	0	0	0.87	0	206	0.03	0.025	79.2	0.01	0.0025	22.3	0.084	6360	0.5	0.107
% of values undetected					50%			50%	100%		100%	100%				100%	
# of values between MDL and MRL					1			1					1				
Calamagrostis sp.-TE18																	
Sample Date																	
08/18/04	36.1	5120	14.9	764	**0.15**	828	32.3	**0.02**	**0.025**	7.4	**0.0015**	**0.0035**	9	**0.008**	2470	**0.9**	0.07
08/29/06	32.3				**0.30**		21.7	0.06	**0.03**	13.9	**0.002**	**0.0015**	**8.1**	**0.01**	3520	**1.3**	0.031
09/14/07	39.7				**0.095**		4.3	**0.015**	**0.025**	8.84	**0.003**	**0.0495**	**3**	**0.017**	1120	**1.7**	0.052
Mean	36	5120	14.9	764	0.18	828	19.4	0.032	0.027	10	0.0022	0.018	6.7	0.012	2370	1.3	0.051
Median	36.1	5120	14.9	764	0.15	828	21.7	0.02	0.025	8.84	0.002	0.0035	8.1	0.01	2470	1.3	0.052
St. Deviation	3.7	NA	NA	NA	0.11	NA	14.1	0.025	0.003	3.4	0.0008	0.027	3.24	0.005	1200	0.4	0.02
# of values	3	1	1	1	3	1	3	3	3	3	3	3	3	3	3	3	3
Minimum	32.3	5120	14.9	764	0.095	828	4.3	0.015	0.025	7.4	0.0015	0.0015	3	0.008	1120	0.9	0.031
Maximum	39.7	5120	14.9	764	0.3	828	32.3	0.06	0.03	13.9	0.003	0.0495	9	0.017	3520	1.7	0.07
% of values undetected					67%			33%	100%		100%	100%		33%			
# of values between MDL and MRL					1			1					2	2		3	
Calamagrostis sp.-TE23																	
Sample Date																	
08/29/06	35.8				2.1		2.9	**0.02**	**0.025**	22.8	**0.01**	**0.0015**	**5.4**	**0.01**	4890	**0.5**	0.04
09/13/07	38.8				**0.35**		4.2	0.1	**0.09**	23.2	**0.003**	**0.0025**	**3.8**	**0.01**	5850	**0.35**	0.051
Mean	37.3				1.2		3.6	0.06	0.06	23	0.007	0.002	4.6	0.01	5370	0.4	0.05
Median	37.3				1.2		3.6	0.06	0.06	23	0.007	0.002	4.6	0.01	5370	0.4	0.05
St. Deviation	2.1				1.2		0.9	0.06	0.05	0.3	0.005	0.0007	1.1	0	680	0.1	0.01
# of values	2	0	0	0	2	0	2	2	2	2	2	2	2	2	2	2	2
Minimum	35.8	0	0	0	0.35	0	2.9	0.02	0.025	22.8	0.003	0.0015	3.8	0.01	4890	0.35	0.04
Maximum	38.8	0	0	0	2.1	0	4.2	0.1	0.09	23.2	0.01	0.0025	5.4	0.01	5850	0.5	0.051
% of values undetected					50%			50%	50%		100%	100%		50%		100%	
# of values between MDL and MRL									1				2	1			

Appendix 35.1D. Vegetation Sample Results, Cook Inlet Drainages Study Area, 2004-2007

	Copper	Iron	Lead	Magnesium	Manganese	Mercury	Molybdenum	Nickel	Potassium	Selenium	Silver	Sodium	Thallium	Tin	Vanadium	Zinc
Species - Location ID	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Athyrium filix-femina-TE24																
Sample Date																
08/30/06	6.68	56.6	0.08	4540	694	0.04	0.06	1.18	12400	**0.05**	**0.003**	312	**0.01**	**3.6**	**0.05**	52.4
09/13/07	6.25	44.2	0.13	7450	436	0.056	0.06	0.79	12800	**0.1**	**0.004**	326	**0.009**	**2.55**	**0.18**	59.8
Mean	6.47	50.4	0.1	6000	565	0.05	0.06	1	12600	0.08	0.0035	319	0.01	3.1	0.1	56.1
Median	6.47	50.4	0.1	6000	565	0.05	0.06	1	12600	0.08	0.0035	319	0.01	3.1	0.1	56.1
St. Deviation	0.3	8.8	0	2060	182	0.01	0	0.3	300	0.04	0.0007	10	0.001	0.7	0.1	5.2
# of values	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Minimum	6.25	44.2	0.08	4540	436	0.04	0.06	0.79	12400	0.05	0.003	312	0.009	2.55	0.05	52.4
Maximum	6.68	56.6	0.13	7450	694	0.056	0.06	1.18	12800	0.1	0.004	326	0.01	3.6	0.18	59.8
% of values undetected										100%	100%		50%	50%		
# of values between MDL and MRL													1	1	2	
Calamagrostis sp.-TE18																
Sample Date																
08/18/04	9.63	79.1	0.11	1170	143	0.067	0.12	3.47	15500	**0.05**	**0.004**	114	**0.001**	**2.45**	**0.14**	31.9
08/29/06	8.96	89.3	0.09	1850	358	**0.014**	0.12	1.95	15600	**0.1**	**0.003**	83.4	**0.01**	**10.05**	**0.09**	27.1
09/14/07	3.8	36.3	0.41	505	292	**0.014**	0.19	0.4	6510	**0.1**	**0.004**	149	**0.006**	**5.5**	**0.08**	38
Mean	7.46	68.2	0.2	1180	264	0.032	0.14	1.94	12500	0.08	0.0037	115	0.006	6	0.1	32.3
Median	8.96	79.1	0.11	1170	292	0.014	0.12	1.95	15500	0.1	0.004	114	0.006	5.5	0.09	31.9
St. Deviation	3.19	28.1	0.18	670	110	0.031	0.04	1.54	5200	0.03	0.0006	33	0.005	3.8	0.03	5.5
# of values	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Minimum	3.8	36.3	0.09	505	143	0.014	0.12	0.4	6510	0.05	0.003	83.4	0.001	2.45	0.08	27.1
Maximum	9.63	89.3	0.41	1850	358	0.067	0.19	3.47	15600	0.1	0.004	149	0.01	10.05	0.14	38
% of values undetected										100%	67%		67%	67%		
# of values between MDL and MRL						2					1		1	1	3	
Calamagrostis sp.-TE23																
Sample Date																
08/29/06	6.08	44.7	**0.04**	1070	330	0.02	1	2.42	16000	**0.2**	**0.003**	34	**0.01**	**4.1**	**0.01**	27.8
09/13/07	5.34	43.4	0.07	1140	598	0.03	1	2.27	11000	**0.1**	**0.004**	75.2	**0.004**	**2.5**	**0.04**	26
Mean	5.71	44.1	0.055	1110	464	0.025	1	2.35	14000	0.15	0.0035	55	0.007	3.3	0.025	27
Median	5.71	44.1	0.055	1110	464	0.025	1	2.35	14000	0.15	0.0035	55	0.007	3.3	0.025	27
St. Deviation	0.52	0.9	0.021	50	190	0.007	0	0.11	4000	0.07	0.0007	29	0.004	1.1	0.021	1
# of values	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Minimum	5.34	43.4	0.04	1070	330	0.02	1	2.27	11000	0.1	0.003	34	0.004	2.5	0.01	26
Maximum	6.08	44.7	0.07	1140	598	0.03	1	2.42	16000	0.2	0.004	75.2	0.01	4.1	0.04	27.8
% of values undetected										50%	100%		50%	50%	50%	
# of values between MDL and MRL			1							1			1	1	1	

Appendix 35.1D. Vegetation Sample Results, Cook Inlet Drainages Study Area, 2004-2007

	Total Solids	Chloride	Fluoride	Sulfate	Total Cyanide	Ammonia	Aluminum	Antimony	Arsenic	Barium	Beryllium	Bismuth	Boron	Cadmium	Calcium	Chromium	Cobalt
Species - Location ID	percent	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Calamagrostis sp.-TE24																	
Sample Date																	
08/30/06	32.4				**0.44**		14.6	0.05	**0.07**	12.5	**0.01**	**0.041**	**3.5**	**0.01**	1270	**0.5**	0.028
09/13/07	41.4				**0.21**		4	**0.015**	**0.025**	15.6	**0.003**	**0.0025**	**3.8**	**0.003**	1880	**0.35**	0.02
Mean	36.9				0.33		9	0.03	0.05	14.1	0.007	0.022	3.7	0.007	1580	0.4	0.02
Median	36.9				0.33		9	0.03	0.05	14.1	0.007	0.022	3.7	0.007	1580	0.4	0.02
St. Deviation	6.4				0.16		7	0.02	0.03	2.2	0.005	0.027	0.2	0.005	430	0.1	0.01
# of values	2	0	0	0	2	0	2	2	2	2	2	2	2	2	2	2	2
Minimum	32.4	0	0	0	0.21	0	4	0.015	0.025	12.5	0.003	0.0025	3.5	0.003	1270	0.35	0.02
Maximum	41.4	0	0	0	0.44	0	14.6	0.05	0.07	15.6	0.01	0.041	3.8	0.01	1880	0.5	0.028
% of values undetected								50%	50%		100%	50%		100%		100%	
# of values between MDL and MRL					2				1			1	2				
Carex aquatilis-TE20																	
Sample Date																	
08/18/04	40.0	7380	13.1	1300	**0.15**	519	28	**0.01**	**0.025**	24.7	**0.004**	**0.0035**	9.5	**0.034**	5370	**0.5**	0.11
08/29/06	32.0				**0.065**		41.4	**0.04**	**0.07**	8.2	**0.01**	**0.0015**	**7.2**	**0.021**	3450	**0.5**	0.056
09/14/07	34.7				**0.11**		12.9	**0.015**	**0.025**	9.99	**0.003**	**0.0025**	**4.8**	0.058	2780	**0.35**	0.032
Mean	35.6	7380	13.1	1300	0.11	519	27.4	0.022	0.04	14.3	0.006	0.0025	7.17	0.038	3870	0.45	0.07
Median	34.7	7380	13.1	1300	0.11	519	28	0.015	0.025	9.99	0.004	0.0025	7.2	0.034	3450	0.5	0.056
St. Deviation	4.1	NA	NA	NA	0.04	NA	14.3	0.016	0.026	9.1	0.004	0.001	2.35	0.019	1340	0.09	0.04
# of values	3	1	1	1	3	1	3	3	3	3	3	3	3	3	3	3	3
Minimum	32	7380	13.1	1300	0.065	519	12.9	0.01	0.025	8.2	0.003	0.0015	4.8	0.021	2780	0.35	0.032
Maximum	40	7380	13.1	1300	0.15	519	41.4	0.04	0.07	24.7	0.01	0.0035	9.5	0.058	5370	0.5	0.11
% of values undetected					100%			67%	67%		67%	100%				67%	
# of values between MDL and MRL								1	1		1		2	2		1	
Carex aquatilis-TE23																	
Sample Date																	
09/13/07	21.9				**0.31**		62.4	**0.03**	**0.18**	15.2	**0.003**	**0.0025**	23.6	**0.046**	17000	**0.35**	0.051
Mean	21.9				0.31		62.4	0.03	0.18	15.2	0.003	0.0025	23.6	0.046	17000	0.35	0.051
Median	21.9				0.31		62.4	0.03	0.18	15.2	0.003	0.0025	23.6	0.046	17000	0.35	0.051
St. Deviation	NA				NA		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
# of values	1	0	0	0	1	0	1	1	1	1	1	1	1	1	1	1	1
Minimum	21.9	0	0	0	0.31	0	62.4	0.03	0.18	15.2	0.003	0.0025	23.6	0.046	17000	0.35	0.051
Maximum	21.9	0	0	0	0.31	0	62.4	0.03	0.18	15.2	0.003	0.0025	23.6	0.046	17000	0.35	0.051
% of values undetected											100%	100%				100%	
# of values between MDL and MRL					1			1	1					1			

Appendix 35.1D. Vegetation Sample Results, Cook Inlet Drainages Study Area, 2004-2007

	Copper	Iron	Lead	Magnesium	Manganese	Mercury	Molybdenum	Nickel	Potassium	Selenium	Silver	Sodium	Thallium	Tin	Vanadium	Zinc
Species - Location ID	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Calamagrostis sp.-TE24																
Sample Date																
08/30/06	5.34	55.1	0.09	902	116	0.021	0.1	1.78	8400	**0.05**	**0.003**	40.8	**0.01**	**3.3**	**0.03**	16.6
09/13/07	5.19	44.5	0.09	996	117	0.018	0.19	0.29	6470	**0.1**	**0.004**	70.3	**0.002**	**2.45**	**0.02**	13.6
Mean	5.27	49.8	0.09	949	117	0.02	0.1	1	7440	0.08	0.0035	55.6	0.006	2.9	0.025	15.1
Median	5.27	49.8	0.09	949	117	0.02	0.1	1	7440	0.08	0.0035	55.6	0.006	2.9	0.025	15.1
St. Deviation	0.11	7.5	0	66	1	0.002	0.1	1.1	1360	0.04	0.0007	20.9	0.006	0.6	0.007	2.1
# of values	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Minimum	5.19	44.5	0.09	902	116	0.018	0.1	0.29	6470	0.05	0.003	40.8	0.002	2.45	0.02	13.6
Maximum	5.34	55.1	0.09	996	117	0.021	0.19	1.78	8400	0.1	0.004	70.3	0.01	3.3	0.03	16.6
% of values undetected										100%	100%		50%	50%	50%	
# of values between MDL and MRL													1	1	1	
Carex aquatilis-TE20																
Sample Date																
08/18/04	3.35	165	0.14	1640	70.6	0.056	3.58	2.29	8060	**0.05**	**0.0015**	2290	**0.001**	**2.5**	**0.1**	12
08/29/06	4.25	204	0.09	1340	98.6	**0.015**	1.45	1.25	20100	**0.2**	**0.003**	814	**0.01**	**10**	**0.12**	14.6
09/14/07	3.6	85.6	0.65	784	152	**0.01**	0.86	0.76	10400	**0.1**	**0.004**	839	**0.001**	**5.1**	**0.08**	15.6
Mean	3.73	152	0.29	1250	107	0.027	1.96	1.43	12900	0.12	0.0028	1310	0.004	6	0.1	14.1
Median	3.6	165	0.14	1340	98.6	0.015	1.45	1.25	10400	0.1	0.003	839	0.001	5.1	0.1	14.6
St. Deviation	0.46	60	0.31	430	41	0.025	1.43	0.78	6400	0.08	0.0013	850	0.005	4	0.02	1.9
# of values	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Minimum	3.35	85.6	0.09	784	70.6	0.01	0.86	0.76	8060	0.05	0.0015	814	0.001	2.5	0.08	12
Maximum	4.25	204	0.65	1640	152	0.056	3.58	2.29	20100	0.2	0.004	2290	0.01	10	0.12	15.6
% of values undetected										67%	100%		100%	67%		
# of values between MDL and MRL						2				1				1	3	
Carex aquatilis-TE23																
Sample Date																
09/13/07	8.73	51.9	0.09	3200	123	0.077	0.17	1.54	11600	**0.1**	**0.004**	198	**0.004**	**2.5**	**0.12**	34.2
Mean	8.73	51.9	0.09	3200	123	0.077	0.17	1.54	11600	0.1	0.004	198	0.004	2.5	0.12	34.2
Median	8.73	51.9	0.09	3200	123	0.077	0.17	1.54	11600	0.1	0.004	198	0.004	2.5	0.12	34.2
St. Deviation	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
# of values	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Minimum	8.73	51.9	0.09	3200	123	0.077	0.17	1.54	11600	0.1	0.004	198	0.004	2.5	0.12	34.2
Maximum	8.73	51.9	0.09	3200	123	0.077	0.17	1.54	11600	0.1	0.004	198	0.004	2.5	0.12	34.2
% of values undetected										100%	100%			100%		
# of values between MDL and MRL													1		1	

Appendix 35.1D. Vegetation Sample Results, Cook Inlet Drainages Study Area, 2004-2007

Species - Location ID	Total Solids	Chloride	Fluoride	Sulfate	Total Cyanide	Ammonia	Aluminum	Antimony	Arsenic	Barium	Beryllium	Bismuth	Boron	Cadmium	Calcium	Chromium	Cobalt
	percent	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Chamerion angustifolium-TE23																	
Sample Date																	
08/29/06	22.8				0.9		66.6	**0.04**	**0.1**	12.5	**0.01**	**0.0015**	25.8	**0.044**	14800	**0.5**	0.071
Mean	22.8				0.9		66.6	0.04	0.1	12.5	0.01	0.0015	25.8	0.044	14800	0.5	0.071
Median	22.8				0.9		66.6	0.04	0.1	12.5	0.01	0.0015	25.8	0.044	14800	0.5	0.071
St. Deviation	NA				NA		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
# of values	1	0	0	0	1	0	1	1	1	1	1	1	1	1	1	1	1
Minimum	22.8	0	0	0	0.9	0	66.6	0.04	0.1	12.5	0.01	0.0015	25.8	0.044	14800	0.5	0.071
Maximum	22.8	0	0	0	0.9	0	66.6	0.04	0.1	12.5	0.01	0.0015	25.8	0.044	14800	0.5	0.071
% of values undetected											100%	100%				100%	
# of values between MDL and MRL								1	1					1			
Cladina rangiferina-TE21																	
Sample Date																	
08/28/04	28.7	68	**0.3**	134	**0.7**	**3.75**	266	0.1	**0.16**	4.1	**0.003**	**0.0035**	**2.5**	**0.034**	589	**0.7**	0.09
09/13/07	37.8				**0.1**		230	0.13	**0.12**	2.04	**0.003**	**0.005**	**0.2**	**0.03**	507	**1.8**	0.062
Mean	33.3	68	0.3	134	0.4	3.75	248	0.1	0.14	3.1	0.003	0.004	1	0.03	548	1	0.08
Median	33.3	68	0.3	134	0.4	3.75	248	0.1	0.14	3.1	0.003	0.004	1	0.03	548	1	0.08
St. Deviation	6.4	NA	NA	NA	0.42	NA	25	0	0.03	1.5	0	0.001	2	0	58	1	0.02
# of values	2	1	1	1	2	1	2	2	2	2	2	2	2	2	2	2	2
Minimum	28.7	68	0.3	134	0.1	3.75	230	0.1	0.12	2.04	0.003	0.0035	0.2	0.03	507	0.7	0.062
Maximum	37.8	68	0.3	134	0.7	3.75	266	0.13	0.16	4.1	0.003	0.005	2.5	0.034	589	1.8	0.09
% of values undetected					100%	100%					50%	50%	100%				
# of values between MDL and MRL			1						2		1	1		2		2	
Cornus canadensis-Berry-TE21																	
Sample Date																	
08/28/04	8.83	3830	**2.1**	3190	**0.7**	33	32.1	0.48	**0.025**	2.8	**0.0015**	**0.0035**	10.9	**0.0035**	4900	**0.5**	0.06
09/13/07	9.2				**1.3**		23.4	0.05	**0.025**	2.65	**0.003**	**0.007**	**8.1**	**0.007**	4920	**0.35**	0.029
Mean	9.0	3830	2.1	3190	1	33	27.8	0.3	0.025	2.7	0.002	0.005	10	0.005	4910	0.4	0.04
Median	9.0	3830	2.1	3190	1	33	27.8	0.3	0.025	2.7	0.002	0.005	10	0.005	4910	0.4	0.04
St. Deviation	0.3	NA	NA	NA	0	NA	6.2	0.3	0	0.1	0.001	0.002	2	0.002	10	0.1	0.02
# of values	2	1	1	1	2	1	2	2	2	2	2	2	2	2	2	2	2
Minimum	8.83	3830	2.1	3190	0.7	33	23.4	0.05	0.025	2.65	0.0015	0.0035	8.1	0.0035	4900	0.35	0.029
Maximum	9.2	3830	2.1	3190	1.3	33	32.1	0.48	0.025	2.8	0.003	0.007	10.9	0.007	4920	0.5	0.06
% of values undetected					50%				100%		100%	50%		50%		50%	
# of values between MDL and MRL			1		1							1	1	1		1	

Appendix 35.1D. Vegetation Sample Results, Cook Inlet Drainages Study Area, 2004-2007

	Copper	Iron	Lead	Magnesium	Manganese	Mercury	Molybdenum	Nickel	Potassium	Selenium	Silver	Sodium	Thallium	Tin	Vanadium	Zinc
Species - Location ID	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Chamerion angustifolium-TE23																
Sample Date																
08/29/06	9.54	58	0.09	3390	115	0.065	0.25	2.59	15400	**0.6**	**0.012**	107	**0.01**	**1.5**	**0.05**	38.5
Mean	9.54	58	0.09	3390	115	0.065	0.25	2.59	15400	0.6	0.012	107	0.01	1.5	0.05	38.5
Median	9.54	58	0.09	3390	115	0.065	0.25	2.59	15400	0.6	0.012	107	0.01	1.5	0.05	38.5
St. Deviation	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
# of values	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Minimum	9.54	58	0.09	3390	115	0.065	0.25	2.59	15400	0.6	0.012	107	0.01	1.5	0.05	38.5
Maximum	9.54	58	0.09	3390	115	0.065	0.25	2.59	15400	0.6	0.012	107	0.01	1.5	0.05	38.5
% of values undetected													100%	100%		
# of values between MDL and MRL										1	1				1	
Cladina rangiferina-TE21																
Sample Date																
08/28/04	1.21	311	1.18	467	38.5	0.028	**0.025**	1.58	549	**0.2**	**0.007**	153	**0.007**	**2.5**	0.77	18.0
09/13/07	1.29	238	0.6	360	17.4	0.03	0.13	0.58	1210	**0.2**	**0.004**	199	**0.006**	**2.5**	0.42	7.38
Mean	1.25	275	0.9	414	28	0.03	0.08	1.1	880	0.2	0.0055	176	0.0065	2.5	0.6	13.0
Median	1.25	275	0.9	414	28	0.03	0.08	1.1	880	0.2	0.0055	176	0.0065	2.5	0.6	13.0
St. Deviation	0.06	52	0.4	76	14.9	0	0.07	0.7	470	0	0.0021	33	0.0007	0	0.25	8.0
# of values	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Minimum	1.21	238	0.6	360	17.4	0.028	0.025	0.58	549	0.2	0.004	153	0.006	2.5	0.42	7.38
Maximum	1.29	311	1.18	467	38.5	0.03	0.13	1.58	1210	0.2	0.007	199	0.007	2.5	0.77	18.0
% of values undetected							50%				50%			100%		
# of values between MDL and MRL										2	1		2			
Cornus canadensis-Berry-TE21																
Sample Date																
08/28/04	3.04	96.9	0.58	1830	18.2	**0.0155**	**0.025**	20.5	14300	**0.05**	**0.003**	1020	**0.001**	**2.5**	**0.1**	13.3
09/13/07	2.02	11.1	0.05	1810	4.56	**0.002**	0.12	1.02	12400	**0.1**	**0.004**	758	**0.001**	**2.6**	**0.12**	4.94
Mean	2.53	54	0.3	1820	11.4	0.009	0.07	10.8	13400	0.08	0.0035	890	0.001	2.6	0.1	9.1
Median	2.53	54	0.3	1820	11.4	0.009	0.07	10.8	13400	0.08	0.0035	890	0.001	2.6	0.1	9.1
St. Deviation	0.72	60.7	0.4	10	9.6	0.01	0.07	13.8	1300	0.04	0.0007	190	0	0.1	0	5.9
# of values	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Minimum	2.02	11.1	0.05	1810	4.56	0.002	0.025	1.02	12400	0.05	0.003	758	0.001	2.5	0.1	4.94
Maximum	3.04	96.9	0.58	1830	18.2	0.0155	0.12	20.5	14300	0.1	0.004	1020	0.001	2.6	0.12	13.3
% of values undetected						100%	50%			100%	100%		100%	100%		
# of values between MDL and MRL															2	

Appendix 35.1D. Vegetation Sample Results, Cook Inlet Drainages Study Area, 2004-2007

	Total Solids	Chloride	Fluoride	Sulfate	Total Cyanide	Ammonia	Aluminum	Antimony	Arsenic	Barium	Beryllium	Bismuth	Boron	Cadmium	Calcium	Chromium	Cobalt
Species - Location ID	percent	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Cornus canadensis-TE21																	
Sample Date																	
08/28/04	24.8	11500	1.7	8220	0.7	225	495	0.1	0.06	17.3	0.0015	0.0035	31.5	0.026	23200	0.5	0.2
09/13/07	29.4				0.125		580	0.1	0.06	16.5	0.003	0.035	26.8	0.022	31800	0.35	0.148
Mean	27.1	11500	1.7	8220	0.41	225	538	0.1	0.06	16.9	0.002	0.019	29.2	0.024	27500	0.4	0.17
Median	27.1	11500	1.7	8220	0.41	225	538	0.1	0.06	16.9	0.002	0.019	29.2	0.024	27500	0.4	0.17
St. Deviation	3.3	NA	NA	NA	0.41	NA	60	0	0	0.6	0.001	0.022	3.3	0.003	6100	0.1	0.04
# of values	2	1	1	1	2	1	2	2	2	2	2	2	2	2	2	2	2
Minimum	24.8	11500	1.7	8220	0.125	225	495	0.1	0.06	16.5	0.0015	0.0035	26.8	0.022	23200	0.35	0.148
Maximum	29.4	11500	1.7	8220	0.7	225	580	0.1	0.06	17.3	0.003	0.035	31.5	0.026	31800	0.5	0.2
% of values undetected					100%						100%	50%				50%	
# of values between MDL and MRL			1						2			1		2		1	
Empetrum nigrum-Berry-TE18																	
Sample Date																	
08/29/06	11.6				0.175		13.6	0.22	0.03	3.23	0.002	0.0015	3.4	0.01	786	0.5	0.009
Mean	11.6				0.175		13.6	0.22	0.03	3.23	0.002	0.0015	3.4	0.01	786	0.5	0.009
Median	11.6				0.175		13.6	0.22	0.03	3.23	0.002	0.0015	3.4	0.01	786	0.5	0.009
St. Deviation	NA				NA		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
# of values	1	0	0	0	1	0	1	1	1	1	1	1	1	1	1	1	1
Minimum	11.6	0	0	0	0.175	0	13.6	0.22	0.03	3.23	0.002	0.0015	3.4	0.01	786	0.5	0.009
Maximum	11.6	0	0	0	0.175	0	13.6	0.22	0.03	3.23	0.002	0.0015	3.4	0.01	786	0.5	0.009
% of values undetected					100%				100%		100%	100%		100%		100%	
# of values between MDL and MRL													1				1
Empetrum nigrum-Berry-TE20																	
Sample Date																	
08/29/06	14.1				0.14		8.9	0.02	0.025	3.86	0.0095	0.01	4.4	0.0095	499	0.5	0.013
Mean	14.1				0.14		8.9	0.02	0.025	3.86	0.0095	0.01	4.4	0.0095	499	0.5	0.013
Median	14.1				0.14		8.9	0.02	0.025	3.86	0.0095	0.01	4.4	0.0095	499	0.5	0.013
St. Deviation	NA				NA		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
# of values	1	0	0	0	1	0	1	1	1	1	1	1	1	1	1	1	1
Minimum	14.1	0	0	0	0.14	0	8.9	0.02	0.025	3.86	0.0095	0.01	4.4	0.0095	499	0.5	0.013
Maximum	14.1	0	0	0	0.14	0	8.9	0.02	0.025	3.86	0.0095	0.01	4.4	0.0095	499	0.5	0.013
% of values undetected					100%			100%	100%		100%			100%		100%	
# of values between MDL and MRL												1	1				1

Appendix 35.1D. Vegetation Sample Results, Cook Inlet Drainages Study Area, 2004-2007

	Copper	Iron	Lead	Magnesium	Manganese	Mercury	Molybdenum	Nickel	Potassium	Selenium	Silver	Sodium	Thallium	Tin	Vanadium	Zinc
Species - Location ID	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Cornus canadensis-TE21																
Sample Date																
08/28/04	4.96	79.2	0.58	7660	44.3	0.108	0.08	3.6	8080	**0.05**	**0.008**	1590	**0.003**	**2.5**	0.24	37.8
09/13/07	1.31	32.6	0.12	6700	19.3	0.066	0.17	3.88	3670	**0.1**	**0.004**	600	**0.003**	**2.5**	0.24	8.68
Mean	3.14	55.9	0.35	7180	31.8	0.09	0.1	3.7	5880	0.08	0.006	1100	0.003	2.5	0.24	23.2
Median	3.14	55.9	0.35	7180	31.8	0.09	0.1	3.7	5880	0.08	0.006	1100	0.003	2.5	0.24	23.2
St. Deviation	2.58	33	0.33	680	17.7	0.03	0.1	0.2	3120	0.04	0.0028	700	0	0	0	20.6
# of values	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Minimum	1.31	32.6	0.12	6700	19.3	0.066	0.08	3.6	3670	0.05	0.004	600	0.003	2.5	0.24	8.68
Maximum	4.96	79.2	0.58	7660	44.3	0.108	0.17	3.88	8080	0.1	0.008	1590	0.003	2.5	0.24	37.8
% of values undetected										100%	50%			100%		
# of values between MDL and MRL											1		2			
Empetrum nigrum-Berry-TE18																
Sample Date																
08/29/06	3.66	40.2	**0.03**	386	26.6	**0.011**	**0.01**	0.33	7360	**0.1**	**0.003**	112	**0.01**	**10.25**	**0.18**	5.8
Mean	3.66	40.2	0.03	386	26.6	0.011	0.01	0.33	7360	0.1	0.003	112	0.01	10.25	0.18	5.8
Median	3.66	40.2	0.03	386	26.6	0.011	0.01	0.33	7360	0.1	0.003	112	0.01	10.25	0.18	5.8
St. Deviation	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
# of values	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Minimum	3.66	40.2	0.03	386	26.6	0.011	0.01	0.33	7360	0.1	0.003	112	0.01	10.25	0.18	5.8
Maximum	3.66	40.2	0.03	386	26.6	0.011	0.01	0.33	7360	0.1	0.003	112	0.01	10.25	0.18	5.8
% of values undetected							100%			100%	100%		100%	100%		
# of values between MDL and MRL			1			1									1	
Empetrum nigrum-Berry-TE20																
Sample Date																
08/29/06	5.03	12.4	0.07	344	11.9	**0.008**	0.09	0.63	7630	**0.05**	**0.006**	319	**0.01**	**10.1**	**0.02**	5.1
Mean	5.03	12.4	0.07	344	11.9	0.008	0.09	0.63	7630	0.05	0.006	319	0.01	10.1	0.02	5.1
Median	5.03	12.4	0.07	344	11.9	0.008	0.09	0.63	7630	0.05	0.006	319	0.01	10.1	0.02	5.1
St. Deviation	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
# of values	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Minimum	5.03	12.4	0.07	344	11.9	0.008	0.09	0.63	7630	0.05	0.006	319	0.01	10.1	0.02	5.1
Maximum	5.03	12.4	0.07	344	11.9	0.008	0.09	0.63	7630	0.05	0.006	319	0.01	10.1	0.02	5.1
% of values undetected										100%			100%	100%		
# of values between MDL and MRL						1					1				1	

Appendix 35.1D. Vegetation Sample Results, Cook Inlet Drainages Study Area, 2004-2007

	Total Solids	Chloride	Fluoride	Sulfate	Total Cyanide	Ammonia	Aluminum	Antimony	Arsenic	Barium	Beryllium	Bismuth	Boron	Cadmium	Calcium	Chromium	Cobalt
Species - Location ID	percent	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Empetrum nigrum-Berry-TE21																	
Sample Date																	
08/28/04	11.7	168	6	195	0.7	32	14	0.48	0.03	3.5	0.0015	0.004	5.6	0.004	753	0.5	0.04
08/28/06	13.3				1.8		10.2	0.04	0.025	4.13	0.01	0.0015	4.9	0.01	832	0.5	0.01
09/13/07	10.8				0.26		3.1	0.3	0.025	4.52	0.003	0.0025	2.3	0.003	601	0.35	0.012
Mean	11.9	168	6	195	0.9	32	9	0.27	0.027	4.05	0.005	0.0027	4.27	0.006	729	0.45	0.021
Median	11.7	168	6	195	0.7	32	10.2	0.3	0.025	4.13	0.003	0.0025	4.9	0.004	753	0.5	0.012
St. Deviation	1.3	NA	NA	NA	0.8	NA	6	0.22	0.003	0.51	0.005	0.0013	1.74	0.004	117	0.09	0.017
# of values	3	1	1	1	3	1	3	3	3	3	3	3	3	3	3	3	3
Minimum	10.8	168	6	195	0.26	32	3.1	0.04	0.025	3.5	0.0015	0.0015	2.3	0.003	601	0.35	0.01
Maximum	13.3	168	6	195	1.8	32	14	0.48	0.03	4.52	0.01	0.004	5.6	0.01	832	0.5	0.04
% of values undetected			100%	100%	67%				100%		100%	100%		100%		67%	
# of values between MDL and MRL		1						1					2			1	2
Empetrum nigrum-Berry-TE22																	
Sample Date																	
08/29/04	13.0	721	0.7	879	0.7	117	25	0.025	0.025	2.8	0.0015	0.0035	5.7	0.0035	622	0.4	0.03
08/28/06	14.4				0.13		8.4	0.04	0.025	3.25	0.01	0.0015	4.4	0.01	571	0.5	0.008
09/13/07	11.6				0.305		2.9	0.06	0.025	3.56	0.003	0.0025	6.6	0.003	542	0.35	0.013
Mean	13.0	721	0.7	879	0.38	117	12	0.042	0.025	3.2	0.005	0.0025	5.57	0.006	578	0.42	0.017
Median	13.0	721	0.7	879	0.305	117	8.4	0.04	0.025	3.25	0.003	0.0025	5.7	0.0035	571	0.4	0.013
St. Deviation	1.4	NA	NA	NA	0.29	NA	12	0.018	0	0.38	0.005	0.001	1.11	0.004	41	0.08	0.012
# of values	3	1	1	1	3	1	3	3	3	3	3	3	3	3	3	3	3
Minimum	11.6	721	0.7	879	0.13	117	2.9	0.025	0.025	2.8	0.0015	0.0015	4.4	0.003	542	0.35	0.008
Maximum	14.4	721	0.7	879	0.7	117	25	0.06	0.025	3.56	0.01	0.0035	6.6	0.01	622	0.5	0.03
% of values undetected			100%		100%			33%	100%		100%	100%		100%		67%	
# of values between MDL and MRL								1					2			1	2
Empetrum nigrum-TE18																	
Sample Date																	
08/18/04	52.3	326	11.7	184	0.15	6.5	1070	0.01	0.17	23.5	0.005	0.0035	12.4	0.011	5030	6.1	0.35
08/29/06	40				0.05		369	0.02	0.06	15	0.002	0.0015	9.6	0.01	4630	1.8	0.112
09/14/07	39				0.09		9	0.015	0.025	18.1	0.003	0.0025	11.3	0.03	4080	0.35	0.047
Mean	43.8	326	11.7	184	0.1	6.5	480	0.015	0.09	18.9	0.0033	0.0025	11.1	0.017	4580	2.8	0.17
Median	40	326	11.7	184	0.09	6.5	369	0.015	0.06	18.1	0.003	0.0025	11.3	0.011	4630	1.8	0.112
St. Deviation	7.4	NA	NA	NA	0.05	NA	540	0.005	0.08	4.3	0.0015	0.001	1.4	0.011	480	3	0.16
# of values	3	1	1	1	3	1	3	3	3	3	3	3	3	3	3	3	3
Minimum	39	326	11.7	184	0.05	6.5	9	0.01	0.025	15	0.002	0.0015	9.6	0.01	4080	0.35	0.047
Maximum	52.3	326	11.7	184	0.15	6.5	1070	0.02	0.17	23.5	0.005	0.0035	12.4	0.03	5030	6.1	0.35
% of values undetected					100%			100%	33%		67%	100%		33%		33%	
# of values between MDL and MRL				1					2		1		1	2		1	

Appendix 35.1D. Vegetation Sample Results, Cook Inlet Drainages Study Area, 2004-2007

	Copper	Iron	Lead	Magnesium	Manganese	Mercury	Molybdenum	Nickel	Potassium	Selenium	Silver	Sodium	Thallium	Tin	Vanadium	Zinc
Species - Location ID	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Empetrum nigrum-Berry-TE21																
Sample Date																
08/28/04	4.19	249	1.49	486	31.3	**0.022**	**0.03**	67.3	9060	**0.05**	**0.007**	469	**0.001**	**2.5**	**0.14**	18.8
08/28/06	5.17	15.9	**0.02**	403	13.9	**0.01**	**0.025**	0.73	6880	**0.05**	**0.003**	213	**0.01**	**9.9**	**0.01**	4.5
09/13/07	4.08	7.8	0.09	464	29.1	**0.013**	0.13	0.73	8730	**0.1**	**0.004**	161	**0.001**	**4.9**	**0.1**	3.95
Mean	4.48	91	0.5	451	24.8	0.015	0.06	23	8220	0.07	0.0047	281	0.004	5.8	0.08	9.1
Median	4.19	15.9	0.09	464	29.1	0.013	0.03	0.73	8730	0.05	0.004	213	0.001	4.9	0.1	4.5
St. Deviation	0.6	137	0.8	43	9.5	0.006	0.06	38	1180	0.03	0.0021	165	0.005	3.8	0.07	8.4
# of values	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Minimum	4.08	7.8	0.02	403	13.9	0.01	0.025	0.73	6880	0.05	0.003	161	0.001	2.5	0.01	3.95
Maximum	5.17	249	1.49	486	31.3	0.022	0.13	67.3	9060	0.1	0.007	469	0.01	9.9	0.14	18.8
% of values undetected						33%	67%			100%	67%		100%	67%	33%	
# of values between MDL and MRL			1			2					1			1	2	
Empetrum nigrum-Berry-TE22																
Sample Date																
08/29/04	2.85	86.4	0.49	350	15	**0.01**	**0.025**	23.4	7420	**0.05**	**0.0015**	235	**0.001**	**2.5**	**0.09**	5.2
08/28/06	4.47	13.5	**0.02**	364	16.1	**0.012**	0.07	1.3	6980	**0.05**	**0.003**	150	**0.01**	**5**	**0.01**	4.4
09/13/07	3.65	17	**0.04**	396	18.1	**0.017**	0.14	0.53	7480	**0.1**	**0.004**	282	**0.002**	**2.45**	**0.12**	4.97
Mean	3.66	39	0.18	370	16.4	0.013	0.08	8	7290	0.07	0.0028	222	0.004	3.3	0.07	4.9
Median	3.65	17	0.04	364	16.1	0.012	0.07	1.3	7420	0.05	0.003	235	0.002	2.5	0.09	4.97
St. Deviation	0.81	41.1	0.27	24	1.6	0.004	0.06	13	270	0.03	0.0013	67	0.005	1.5	0.06	0.4
# of values	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Minimum	2.85	13.5	0.02	350	15	0.01	0.025	0.53	6980	0.05	0.0015	150	0.001	2.45	0.01	4.4
Maximum	4.47	86.4	0.49	396	18.1	0.017	0.14	23.4	7480	0.1	0.004	282	0.01	5	0.12	5.2
% of values undetected						33%	33%			100%	100%		67%	67%	33%	
# of values between MDL and MRL			2			2							1	1	2	
Empetrum nigrum-TE18																
Sample Date																
08/18/04	7.08	996	0.3	1200	114	0.053	0.06	17	4670	**0.05**	**0.002**	89.3	**0.003**	**2.5**	1.7	11.6
08/29/06	4.99	265	0.12	1180	61.8	**0.016**	**0.01**	3.94	6450	**0.1**	**0.003**	56.2	**0.01**	**10.1**	0.41	13.9
09/14/07	5.7	28.4	0.45	1300	190	**0.006**	0.06	1.18	5260	**0.1**	**0.004**	39.9	**0.001**	**2.45**	**0.14**	15.7
Mean	5.92	430	0.29	1200	122	0.025	0.043	7.4	5460	0.08	0.003	61.8	0.005	5	0.8	13.7
Median	5.7	265	0.3	1200	114	0.016	0.06	3.94	5260	0.1	0.003	56.2	0.003	2.5	0.41	13.9
St. Deviation	1.06	504	0.17	100	64	0.025	0.029	8.5	910	0.03	0.001	25.2	0.005	4.4	0.8	2.1
# of values	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Minimum	4.99	28.4	0.12	1180	61.8	0.006	0.01	1.18	4670	0.05	0.002	39.9	0.001	2.45	0.14	11.6
Maximum	7.08	996	0.45	1300	190	0.053	0.06	17	6450	0.1	0.004	89.3	0.01	10.1	1.7	15.7
% of values undetected							33%			100%	100%		67%	100%		
# of values between MDL and MRL						2							1		1	

Appendix 35.1D. Vegetation Sample Results, Cook Inlet Drainages Study Area, 2004-2007

	Total Solids	Chloride	Fluoride	Sulfate	Total Cyanide	Ammonia	Aluminum	Antimony	Arsenic	Barium	Beryllium	Bismuth	Boron	Cadmium	Calcium	Chromium	Cobalt
Species - Location ID	percent	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Empetrum nigrum-TE20																	
Sample Date																	
08/18/04	54.9	714	7.9	191	0.15	6.0	56.8	0.03	0.025	30.2	0.0015	0.0035	21.3	0.017	4880	0.3	0.11
08/29/06	45.3				0.10		66.7	0.02	0.025	38.2	0.01	0.0015	28.5	0.01	5850	0.5	0.082
Mean	50.1	714	7.9	191	0.1	6.0	61.8	0.025	0.025	34.2	0.01	0.0025	24.9	0.01	5370	0.4	0.1
Median	50.1	714	7.9	191	0.1	6.0	61.8	0.025	0.025	34.2	0.01	0.0025	24.9	0.01	5370	0.4	0.1
St. Deviation	6.8	NA	NA	NA	0	NA	7	0.007	0	5.7	0.01	0.0014	5.1	0	690	0.14	0.02
# of values	2	1	1	1	2	1	2	2	2	2	2	2	2	2	2	2	2
Minimum	45.3	714	7.9	191	0.1	6	56.8	0.02	0.025	30.2	0.0015	0.0015	21.3	0.01	4880	0.3	0.082
Maximum	54.9	714	7.9	191	0.15	6	66.7	0.03	0.025	38.2	0.01	0.0035	28.5	0.017	5850	0.5	0.11
% of values undetected					50%			50%	100%		100%	100%		50%		50%	
# of values between MDL and MRL				1	1	1		1						1		1	
Empetrum nigrum-TE21																	
Sample Date																	
08/28/04	42.7	442	0.4	475	0.7	3.75	40	0.025	0.025	25.2	0.0015	0.0035	31.4	0.0035	5100	0.4	0.07
08/28/06	45.1				0.045		11.3	0.02	0.025	18.2	0.01	0.0015	16.5	0.01	5220	0.5	0.033
09/13/07	45.3				0.08		18.6	0.11	0.06	35.7	0.003	0.0025	15.5	0.008	5280	0.35	0.046
Mean	44.4	442	0.4	475	0.28	3.75	23.3	0.05	0.037	26.4	0.005	0.0025	21.1	0.007	5200	0.42	0.05
Median	45.1	442	0.4	475	0.08	3.75	18.6	0.025	0.025	25.2	0.003	0.0025	16.5	0.008	5220	0.4	0.046
St. Deviation	1.4	NA	NA	NA	0.37	NA	14.9	0.05	0.02	8.8	0.005	0.001	8.9	0.003	90	0.08	0.019
# of values	3	1	1	1	3	1	3	3	3	3	3	3	3	3	3	3	3
Minimum	42.7	442	0.4	475	0.045	3.75	11.3	0.02	0.025	18.2	0.0015	0.0015	15.5	0.0035	5100	0.35	0.033
Maximum	45.3	442	0.4	475	0.7	3.75	40	0.11	0.06	35.7	0.01	0.0035	31.4	0.01	5280	0.5	0.07
% of values undetected					100%	100%		67%	67%		100%	100%		67%		67%	
# of values between MDL and MRL			1						1				1	1		1	
Empetrum nigrum-TE22																	
Sample Date																	
08/29/04	54.1	244	0.2	662	0.7	3.75	53.1	0.025	0.025	23.5	0.0015	0.0035	23.3	0.007	5720	0.3	0.07
08/28/06	44				0.12		21.1	0.02	0.025	16.5	0.01	0.005	14.6	0.01	4060	0.5	0.028
09/13/07	43.5				0.085		15.2	0.11	0.06	25.7	0.003	0.0025	19.7	0.012	4770	0.35	0.051
Mean	47.2	244	0.2	662	0.3	3.75	29.8	0.05	0.037	21.9	0.005	0.0037	19.2	0.01	4850	0.38	0.05
Median	44	244	0.2	662	0.12	3.75	21.1	0.025	0.025	23.5	0.003	0.0035	19.7	0.01	4770	0.35	0.051
St. Deviation	6	NA	NA	NA	0.35	NA	20.4	0.05	0.02	4.8	0.005	0.0013	4.4	0.003	830	0.1	0.021
# of values	3	1	1	1	3	1	3	3	3	3	3	3	3	3	3	3	3
Minimum	43.5	244	0.2	662	0.085	3.75	15.2	0.02	0.025	16.5	0.0015	0.0025	14.6	0.007	4060	0.3	0.028
Maximum	54.1	244	0.2	662	0.7	3.75	53.1	0.11	0.06	25.7	0.01	0.005	23.3	0.012	5720	0.5	0.07
% of values undetected			100%		67%	100%		67%	67%		100%	67%		33%		67%	
# of values between MDL and MRL					1				1			1	1	2		1	

Appendix 35.1D. Vegetation Sample Results, Cook Inlet Drainages Study Area, 2004-2007

	Copper	Iron	Lead	Magnesium	Manganese	Mercury	Molybdenum	Nickel	Potassium	Selenium	Silver	Sodium	Thallium	Tin	Vanadium	Zinc
Species - Location ID	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Empetrum nigrum-TE20																
Sample Date																
08/18/04	4.47	53.6	0.32	1010	630	0.052	1.06	8.77	3450	**0.05**	**0.0015**	72.7	**0.004**	**2.5**	0.21	16.8
08/29/06	4.82	77.1	0.14	1840	353	0.021	0.15	2.83	5950	**0.05**	**0.003**	83.3	**0.01**	**10.1**	**0.08**	20.1
Mean	4.65	65.4	0.23	1430	492	0.037	0.6	5.8	4700	0.05	0.002	78	0.007	6	0.1	18.5
Median	4.65	65.4	0.23	1430	492	0.037	0.6	5.8	4700	0.05	0.002	78	0.007	6	0.1	18.5
St. Deviation	0.25	16.6	0.13	590	196	0.022	0.6	4.2	1770	0	0.001	7.5	0.004	5	0.1	2.3
# of values	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Minimum	4.47	53.6	0.14	1010	353	0.021	0.15	2.83	3450	0.05	0.0015	72.7	0.004	2.5	0.08	16.8
Maximum	4.82	77.1	0.32	1840	630	0.052	1.06	8.77	5950	0.05	0.003	83.3	0.01	10.1	0.21	20.1
% of values undetected										100%	100%		50%	100%		
# of values between MDL and MRL													1		1	
Empetrum nigrum-TE21																
Sample Date																
08/28/04	3.31	50.4	0.19	1490	285	0.03	**0.025**	2.08	3850	**0.05**	**0.0015**	68.5	**0.001**	**2.5**	**0.14**	16.5
08/28/06	4.6	24.8	0.07	1660	155	**0.018**	0.06	1.52	6130	**0.05**	**0.003**	65.2	**0.01**	**10.1**	**0.01**	12
09/13/07	3.67	29.2	0.08	1630	184	**0.012**	0.13	1.22	4940	**0.1**	**0.004**	45.6	**0.001**	**2.55**	**0.16**	10.1
Mean	3.86	34.8	0.11	1590	208	0.02	0.07	1.61	4970	0.07	0.0028	59.8	0.004	5.1	0.1	12.9
Median	3.67	29.2	0.08	1630	184	0.018	0.06	1.52	4940	0.05	0.003	65.2	0.001	2.55	0.14	12
St. Deviation	0.67	13.7	0.07	90	68	0.009	0.05	0.44	1140	0.03	0.0013	12.4	0.005	4.4	0.08	3.3
# of values	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Minimum	3.31	24.8	0.07	1490	155	0.012	0.025	1.22	3850	0.05	0.0015	45.6	0.001	2.5	0.01	10.1
Maximum	4.6	50.4	0.19	1660	285	0.03	0.13	2.08	6130	0.1	0.004	68.5	0.01	10.1	0.16	16.5
% of values undetected							33%			100%	100%		100%	100%	33%	
# of values between MDL and MRL						2									2	
Empetrum nigrum-TE22																
Sample Date																
08/29/04	1.86	52.9	0.28	1430	233	0.029	**0.025**	3.07	3580	**0.05**	**0.0015**	23.8	**0.001**	**2.5**	**0.19**	9.7
08/28/06	3.93	25.6	**0.04**	1430	155	**0.012**	0.11	2.7	6190	**0.05**	**0.003**	66.1	**0.01**	**5.8**	**0.02**	10.5
09/13/07	4.21	26.3	0.09	1370	222	**0.011**	0.13	1.39	5360	**0.1**	**0.004**	129	**0.001**	**2.55**	**0.19**	11.5
Mean	3.33	34.9	0.14	1410	203	0.017	0.09	2.39	5040	0.07	0.0028	73	0.004	3.6	0.13	10.6
Median	3.93	26.3	0.09	1430	222	0.012	0.11	2.7	5360	0.05	0.003	66.1	0.001	2.55	0.19	10.5
St. Deviation	1.28	15.6	0.13	30	42	0.01	0.06	0.88	1330	0.03	0.0013	53	0.005	1.9	0.1	0.9
# of values	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Minimum	1.86	25.6	0.04	1370	155	0.011	0.025	1.39	3580	0.05	0.0015	23.8	0.001	2.5	0.02	9.7
Maximum	4.21	52.9	0.28	1430	233	0.029	0.13	3.07	6190	0.1	0.004	129	0.01	5.8	0.19	11.5
% of values undetected							33%			100%	100%		100%	67%		
# of values between MDL and MRL			1			2								1	3	

Appendix 35.1D. Vegetation Sample Results, Cook Inlet Drainages Study Area, 2004-2007

	Total Solids	Chloride	Fluoride	Sulfate	Total Cyanide	Ammonia	Aluminum	Antimony	Arsenic	Barium	Beryllium	Bismuth	Boron	Cadmium	Calcium	Chromium	Cobalt
Species - Location ID	percent	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Equisetum pratense-TE20																	
Sample Date																	
08/18/04	23.5	23600	30.0	15500	**0.15**	952	68.2	**0.03**	**0.025**	54.8	**0.01**	**0.0035**	31.7	**0.015**	17900	1	0.7
08/29/06	25.7				**0.08**		79.9	**0.02**	**0.18**	46.4	**0.01**	**0.0015**	34.3	**0.026**	22300	**0.5**	0.679
Mean	24.6	23600	30	15500	0.1	952	74.1	0.025	0.1	50.6	0.01	0.0025	33	0.021	20100	0.8	0.69
Median	24.6	23600	30	15500	0.1	952	74.1	0.025	0.1	50.6	0.01	0.0025	33	0.021	20100	0.8	0.69
St. Deviation	1.6	NA	NA	NA	0	NA	8.3	0.007	0.11	5.9	0	0.0014	1.8	0.008	3100	0.4	0.01
# of values	2	1	1	1	2	1	2	2	2	2	2	2	2	2	2	2	2
Minimum	23.5	23600	30	15500	0.08	952	68.2	0.02	0.025	46.4	0.01	0.0015	31.7	0.015	17900	0.5	0.679
Maximum	25.7	23600	30	15500	0.15	952	79.9	0.03	0.18	54.8	0.01	0.0035	34.3	0.026	22300	1	0.7
% of values undetected					100%			50%	50%		50%	100%				50%	
# of values between MDL and MRL								1	1		1			2			
Flavocetraria cucullata-TE22																	
Sample Date																	
08/29/04	44.4	242	**0.1**	118	**0.7**	**3.75**	149	0.18	**0.07**	3.4	**0.0015**	**0.0035**	**2.5**	**0.045**	1240	**0.6**	0.08
08/28/06	79				0.42		397	0.05	**0.08**	6.23	**0.01**	**0.02**	**1.5**	0.06	2020	2.2	0.093
09/13/07	37.2				**0.25**		189	0.14	**0.14**	2.87	**0.003**	**0.0025**	**0.2**	**0.045**	1070	2.8	0.083
Mean	53.5	242	0.1	118	0.46	3.75	245	0.12	0.1	4.17	0.005	0.009	1.4	0.05	1440	1.9	0.085
Median	44.4	242	0.1	118	0.42	3.75	189	0.14	0.08	3.4	0.003	0.0035	1.5	0.045	1240	2.2	0.083
St. Deviation	22.3	NA	NA	NA	0.23	NA	133	0.07	0.04	1.81	0.005	0.01	1.15	0.009	510	1.1	0.007
# of values	3	1	1	1	3	1	3	3	3	3	3	3	3	3	3	3	3
Minimum	37.2	242	0.1	118	0.25	3.75	149	0.05	0.07	2.87	0.0015	0.0025	0.2	0.045	1070	0.6	0.08
Maximum	79	242	0.1	118	0.7	3.75	397	0.18	0.14	6.23	0.01	0.02	2.5	0.06	2020	2.8	0.093
% of values undetected			100%		33%	100%					100%	67%	100%				
# of values between MDL and MRL					1				3			1		2		1	
Ledum decumbens-TE18																	
Sample Date																	
09/14/07	32.4				**0.11**		58.6	**0.03**	**0.025**	66.6	**0.003**	**0.0025**	**9.7**	**0.036**	5080	**0.35**	0.07
Mean	32.4				0.11		58.6	0.03	0.025	66.6	0.003	0.0025	9.7	0.036	5080	0.35	0.07
Median	32.4				0.11		58.6	0.03	0.025	66.6	0.003	0.0025	9.7	0.036	5080	0.35	0.07
St. Deviation	NA				NA		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
# of values	1	0	0	0	1	0	1	1	1	1	1	1	1	1	1	1	1
Minimum	32.4	0	0	0	0.11	0	58.6	0.03	0.025	66.6	0.003	0.0025	9.7	0.036	5080	0.35	0.07
Maximum	32.4	0	0	0	0.11	0	58.6	0.03	0.025	66.6	0.003	0.0025	9.7	0.036	5080	0.35	0.07
% of values undetected					100%				100%		100%	100%				100%	
# of values between MDL and MRL								1					1	1			

Appendix 35.1D. Vegetation Sample Results, Cook Inlet Drainages Study Area, 2004-2007

	Copper	Iron	Lead	Magnesium	Manganese	Mercury	Molybdenum	Nickel	Potassium	Selenium	Silver	Sodium	Thallium	Tin	Vanadium	Zinc
Species - Location ID	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Equisetum pratense-TE20																
Sample Date																
08/18/04	5.7	102	0.19	3240	57.2	0.048	1.46	5.01	29200	**0.5**	**0.007**	412	0.072	**2.5**	**0.18**	19.7
08/29/06	5.82	126	0.05	3020	86.1	**0.018**	2.06	6.66	26600	**0.9**	**0.003**	436	0.06	**1.5**	**0.14**	26.7
Mean	5.8	114	0.1	3130	71.7	0.033	1.76	5.84	27900	0.7	0.005	424	0.07	2	0.16	23.2
Median	5.8	114	0.1	3130	71.7	0.033	1.76	5.84	27900	0.7	0.005	424	0.07	2	0.16	23.2
St. Deviation	0.1	17	0.1	160	20.4	0.021	0.42	1.17	1800	0.28	0.0028	17	0.01	0.7	0.03	4.9
# of values	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Minimum	5.7	102	0.05	3020	57.2	0.018	1.46	5.01	26600	0.5	0.003	412	0.06	1.5	0.14	19.7
Maximum	5.82	126	0.19	3240	86.1	0.048	2.06	6.66	29200	0.9	0.007	436	0.072	2.5	0.18	26.7
% of values undetected											50%			100%		
# of values between MDL and MRL						1				2	1				2	
Flavocetraria cucullata-TE22																
Sample Date																
08/29/04	0.75	153	1.09	1060	36.3	0.028	**0.025**	2.22	727	**0.05**	**0.009**	386	**0.003**	**2.5**	0.38	15.5
08/28/06	1.17	298	0.88	1010	72.2	**0.019**	0.06	6.27	944	**0.1**	**0.003**	420	**0.01**	**5.9**	0.54	12.1
09/13/07	2.34	200	0.78	612	43.1	0.038	0.12	0.74	1420	**0.2**	**0.013**	974	**0.005**	**2.55**	0.43	14.8
Mean	1.42	217	0.9	890	50.5	0.028	0.07	3.08	1030	0.12	0.008	593	0.006	3.7	0.45	14.1
Median	1.17	200	0.88	1010	43.1	0.028	0.06	2.22	944	0.1	0.009	420	0.005	2.55	0.43	14.8
St. Deviation	0.82	74	0.2	250	19.1	0.01	0.05	2.86	350	0.08	0.005	330	0.004	1.9	0.08	1.8
# of values	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Minimum	0.75	153	0.78	612	36.3	0.019	0.025	0.74	727	0.05	0.003	386	0.003	2.5	0.38	12.1
Maximum	2.34	298	1.09	1060	72.2	0.038	0.12	6.27	1420	0.2	0.013	974	0.01	5.9	0.54	15.5
% of values undetected							33%			33%	33%		33%	67%		
# of values between MDL and MRL						1				2	2		2	1		
Ledum decumbens-TE18																
Sample Date																
09/14/07	5.3	45.9	0.46	1260	366	**0.014**	0.1	1.36	5650	**0.1**	**0.004**	38.7	0.038	**2.45**	0.25	33.9
Mean	5.3	45.9	0.46	1260	366	0.014	0.1	1.36	5650	0.1	0.004	38.7	0.038	2.45	0.25	33.9
Median	5.3	45.9	0.46	1260	366	0.014	0.1	1.36	5650	0.1	0.004	38.7	0.038	2.45	0.25	33.9
St. Deviation	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
# of values	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Minimum	5.3	45.9	0.46	1260	366	0.014	0.1	1.36	5650	0.1	0.004	38.7	0.038	2.45	0.25	33.9
Maximum	5.3	45.9	0.46	1260	366	0.014	0.1	1.36	5650	0.1	0.004	38.7	0.038	2.45	0.25	33.9
% of values undetected										100%	100%			100%		
# of values between MDL and MRL						1										

Appendix 35.1D. Vegetation Sample Results, Cook Inlet Drainages Study Area, 2004-2007

	Total Solids	Chloride	Fluoride	Sulfate	Total Cyanide	Ammonia	Aluminum	Antimony	Arsenic	Barium	Beryllium	Bismuth	Boron	Cadmium	Calcium	Chromium	Cobalt
Species - Location ID	percent	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Ledum decumbens-TE20																	
Sample Date																	
09/14/07	40				**0.09**		21.5	**0.015**	**0.025**	54.4	**0.003**	**0.0505**	15.3	0.056	4770	**0.8**	0.052
Mean	40				0.09		21.5	0.015	0.025	54.4	0.003	0.0505	15.3	0.056	4770	0.8	0.052
Median	40				0.09		21.5	0.015	0.025	54.4	0.003	0.0505	15.3	0.056	4770	0.8	0.052
St. Deviation	NA				NA		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
# of values	1	0	0	0	1	0	1	1	1	1	1	1	1	1	1	1	1
Minimum	40	0	0	0	0.09	0	21.5	0.015	0.025	54.4	0.003	0.0505	15.3	0.056	4770	0.8	0.052
Maximum	40	0	0	0	0.09	0	21.5	0.015	0.025	54.4	0.003	0.0505	15.3	0.056	4770	0.8	0.052
% of values undetected					100%			100%	100%		100%	100%					
# of values between MDL and MRL																1	
Ledum palustre-TE18																	
Sample Date																	
08/18/04	19.3	3970	29.2	1280	**0.15**	713	104	**0.01**	**0.025**	6.7	**0.0015**	**0.0035**	22.1	0.258	7800	**0.6**	0.2
08/29/06	38.4				**0.055**		134	0.05	**0.03**	38.5	**0.002**	**0.0015**	**7.6**	**0.01**	4940	**0.5**	0.056
Mean	28.9	3970	29.2	1280	0.1	713	119	0.03	0.03	23	0.002	0.0025	15	0.13	6370	0.55	0.1
Median	28.9	3970	29.2	1280	0.1	713	119	0.03	0.03	23	0.002	0.0025	15	0.13	6370	0.55	0.1
St. Deviation	13.5	NA	NA	NA	0.07	NA	21	0.028	0	22	0	0.0014	10	0.18	2020	0.07	0.1
# of values	2	1	1	1	2	1	2	2	2	2	2	2	2	2	2	2	2
Minimum	19.3	3970	29.2	1280	0.055	713	104	0.01	0.025	6.7	0.0015	0.0015	7.6	0.01	4940	0.5	0.056
Maximum	38.4	3970	29.2	1280	0.15	713	134	0.05	0.03	38.5	0.002	0.0035	22.1	0.258	7800	0.6	0.2
% of values undetected					100%			50%	100%		100%	100%		50%		50%	
# of values between MDL and MRL													1			1	
Ledum palustre-TE20																	
Sample Date																	
08/18/04	52.4	252	10.5	448	**0.15**	6.6	44.8	**0.02**	**0.025**	74.9	**0.0015**	**0.0035**	24.2	**0.007**	5490	**0.15**	0.08
08/29/06	48.4				**0.19**		26.9	**0.02**	**0.025**	48.7	**0.01**	**0.021**	**14.5**	**0.01**	4890	**0.5**	0.046
Mean	50.4	252	10.5	448	0.17	6.6	35.9	0.02	0.025	61.8	0.01	0.012	19.4	0.009	5190	0.3	0.06
Median	50.4	252	10.5	448	0.17	6.6	35.9	0.02	0.025	61.8	0.01	0.012	19.4	0.009	5190	0.3	0.06
St. Deviation	2.8	NA	NA	NA	0.03	NA	12.7	0	0	18.5	0.01	0.012	6.9	0.002	420	0.2	0.02
# of values	2	1	1	1	2	1	2	2	2	2	2	2	2	2	2	2	2
Minimum	48.4	252	10.5	448	0.15	6.6	26.9	0.02	0.025	48.7	0.0015	0.0035	14.5	0.007	4890	0.15	0.046
Maximum	52.4	252	10.5	448	0.19	6.6	44.8	0.02	0.025	74.9	0.01	0.021	24.2	0.01	5490	0.5	0.08
% of values undetected					50%			50%	100%		100%	50%		50%		100%	
# of values between MDL and MRL					1			1				1	1	1			

Appendix 35.1D. Vegetation Sample Results, Cook Inlet Drainages Study Area, 2004-2007

	Copper	Iron	Lead	Magnesium	Manganese	Mercury	Molybdenum	Nickel	Potassium	Selenium	Silver	Sodium	Thallium	Tin	Vanadium	Zinc
Species - Location ID	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Ledum decumbens-TE20																
Sample Date																
09/14/07	6.1	24.6	0.65	1580	524	**0.013**	0.09	1	4810	**0.1**	**0.004**	55.8	0.085	**2.5**	**0.17**	26
Mean	6.1	24.6	0.65	1580	524	0.013	0.09	1	4810	0.1	0.004	55.8	0.085	2.5	0.17	26
Median	6.1	24.6	0.65	1580	524	0.013	0.09	1	4810	0.1	0.004	55.8	0.085	2.5	0.17	26
St. Deviation	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
# of values	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Minimum	6.1	24.6	0.65	1580	524	0.013	0.09	1	4810	0.1	0.004	55.8	0.085	2.5	0.17	26
Maximum	6.1	24.6	0.65	1580	524	0.013	0.09	1	4810	0.1	0.004	55.8	0.085	2.5	0.17	26
% of values undetected										100%	100%			100%		
# of values between MDL and MRL						1									1	
Ledum palustre-TE18																
Sample Date																
08/18/04	12.4	132	0.1	2610	88.4	0.05	0.1	3.63	39200	**0.05**	**0.002**	184	**0.001**	**2.5**	0.29	26.5
08/29/06	3.39	117	0.1	1230	290	0.023	**0.03**	1.45	6300	**0.1**	**0.003**	33.8	0.04	**10.1**	0.29	28.3
Mean	7.9	125	0.1	1920	189	0.04	0.07	2.54	22800	0.08	0.0025	109	0.021	6	0.29	27.4
Median	7.9	125	0.1	1920	189	0.04	0.07	2.54	22800	0.08	0.0025	109	0.021	6	0.29	27.4
St. Deviation	6.4	11	0	980	143	0.02	0.05	1.54	23300	0.04	0.0007	106	0.028	5	0	1.3
# of values	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Minimum	3.39	117	0.1	1230	88.4	0.023	0.03	1.45	6300	0.05	0.002	33.8	0.001	2.5	0.29	26.5
Maximum	12.4	132	0.1	2610	290	0.05	0.1	3.63	39200	0.1	0.003	184	0.04	10.1	0.29	28.3
% of values undetected										100%	100%		50%	100%		
# of values between MDL and MRL							1									
Ledum palustre-TE20																
Sample Date																
08/18/04	4.36	38.9	0.21	1250	886	0.054	0.58	1.17	4050	**0.05**	**0.0015**	59.2	0.092	**2.5**	**0.15**	30.0
08/29/06	3.88	28.6	0.06	1620	763	0.025	0.19	1.52	5320	**0.05**	**0.003**	35.8	0.06	**10.1**	**0.02**	31.8
Mean	4.12	33.8	0.1	1440	825	0.04	0.39	1.35	4690	0.05	0.002	47.5	0.08	6	0.1	31.0
Median	4.12	33.8	0.1	1440	825	0.04	0.39	1.35	4690	0.05	0.002	47.5	0.08	6	0.1	31.0
St. Deviation	0.34	7.3	0.1	260	87	0.021	0.28	0.25	900	0	0.001	16.5	0.02	5	0.1	1
# of values	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Minimum	3.88	28.6	0.06	1250	763	0.025	0.19	1.17	4050	0.05	0.0015	35.8	0.06	2.5	0.02	30
Maximum	4.36	38.9	0.21	1620	886	0.054	0.58	1.52	5320	0.05	0.003	59.2	0.092	10.1	0.15	31.8
% of values undetected										100%	100%			100%		
# of values between MDL and MRL															2	

Appendix 35.1D. Vegetation Sample Results, Cook Inlet Drainages Study Area, 2004-2007

	Total Solids	Chloride	Fluoride	Sulfate	Total Cyanide	Ammonia	Aluminum	Antimony	Arsenic	Barium	Beryllium	Bismuth	Boron	Cadmium	Calcium	Chromium	Cobalt
Species - Location ID	percent	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Leymus arenarius-TE19																	
Sample Date																	
08/29/06	31.3				**0.065**		2.9	0.05	0.1	0.74	**0.002**	**0.025**	11.7	**0.01**	1510	2.1	0.011
Mean	31.3				0.065		2.9	0.05	0.1	0.74	0.002	0.025	11.7	0.01	1510	2.1	0.011
Median	31.3				0.065		2.9	0.05	0.1	0.74	0.002	0.025	11.7	0.01	1510	2.1	0.011
St. Deviation	NA				NA		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
# of values	1	0	0	0	1	0	1	1	1	1	1	1	1	1	1	1	1
Minimum	31.3	0	0	0	0.065	0	2.9	0.05	0.1	0.74	0.002	0.025	11.7	0.01	1510	2.1	0.011
Maximum	31.3	0	0	0	0.065	0	2.9	0.05	0.1	0.74	0.002	0.025	11.7	0.01	1510	2.1	0.011
% of values undetected					100%						100%	100%		100%			
# of values between MDL and MRL									1				1				1
Leymus arenarius-TE20																	
Sample Date																	
08/18/04	37.7	10400	15.1	1780	**0.15**	331	**2**	**0.01**	**0.025**	0.8	**0.0015**	**0.0035**	9.7	**0.0035**	1170	**0.15**	0.02
Mean	37.7	10400	15.1	1780	0.15	331	2	0.01	0.025	0.8	0.0015	0.0035	9.7	0.0035	1170	0.15	0.02
Median	37.7	10400	15.1	1780	0.15	331	2	0.01	0.025	0.8	0.0015	0.0035	9.7	0.0035	1170	0.15	0.02
St. Deviation	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
# of values	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Minimum	37.7	10400	15.1	1780	0.15	331	2	0.01	0.025	0.8	0.0015	0.0035	9.7	0.0035	1170	0.15	0.02
Maximum	37.7	10400	15.1	1780	0.15	331	2	0.01	0.025	0.8	0.0015	0.0035	9.7	0.0035	1170	0.15	0.02
% of values undetected					100%		100%	100%	100%		100%	100%		100%		100%	
# of values between MDL and MRL																	
Leymus mollis-TE19																	
Sample Date																	
09/14/07	26.5				**0.145**		7.7	**0.015**	0.17	1.35	**0.003**	**0.05**	4.9	0.067	1610	1.8	0.02
Mean	26.5				0.145		7.7	0.015	0.17	1.35	0.003	0.05	4.9	0.067	1610	1.8	0.02
Median	26.5				0.145		7.7	0.015	0.17	1.35	0.003	0.05	4.9	0.067	1610	1.8	0.02
St. Deviation	NA				NA		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
# of values	1	0	0	0	1	0	1	1	1	1	1	1	1	1	1	1	1
Minimum	26.5	0	0	0	0.145	0	7.7	0.015	0.17	1.35	0.003	0.05	4.9	0.067	1610	1.8	0.02
Maximum	26.5	0	0	0	0.145	0	7.7	0.015	0.17	1.35	0.003	0.05	4.9	0.067	1610	1.8	0.02
% of values undetected					100%			100%			100%	100%					
# of values between MDL and MRL									1				1			1	

Appendix 35.1D. Vegetation Sample Results, Cook Inlet Drainages Study Area, 2004-2007

	Copper	Iron	Lead	Magnesium	Manganese	Mercury	Molybdenum	Nickel	Potassium	Selenium	Silver	Sodium	Thallium	Tin	Vanadium	Zinc
Species - Location ID	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Leymus arenarius-TE19																
Sample Date																
08/29/06	3.06	44.2	**0.03**	1090	10.7	**0.016**	0.66	2.4	26800	**0.1**	**0.003**	376	**0.01**	**10**	**0.05**	11.4
Mean	3.06	44.2	0.03	1090	10.7	0.016	0.66	2.4	26800	0.1	0.003	376	0.01	10	0.05	11.4
Median	3.06	44.2	0.03	1090	10.7	0.016	0.66	2.4	26800	0.1	0.003	376	0.01	10	0.05	11.4
St. Deviation	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
# of values	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Minimum	3.06	44.2	0.03	1090	10.7	0.016	0.66	2.4	26800	0.1	0.003	376	0.01	10	0.05	11.4
Maximum	3.06	44.2	0.03	1090	10.7	0.016	0.66	2.4	26800	0.1	0.003	376	0.01	10	0.05	11.4
% of values undetected										100%	100%		100%	100%		
# of values between MDL and MRL			1			1									1	
Leymus arenarius-TE20																
Sample Date																
08/18/04	4.64	33.6	**0.02**	1100	15	0.048	0.45	3.24	21500	**0.2**	**0.002**	261	**0.001**	**2.5**	**0.1**	16.4
Mean	4.64	33.6	0.02	1100	15	0.048	0.45	3.24	21500	0.2	0.002	261	0.001	2.5	0.1	16.4
Median	4.64	33.6	0.02	1100	15	0.048	0.45	3.24	21500	0.2	0.002	261	0.001	2.5	0.1	16.4
St. Deviation	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
# of values	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Minimum	4.64	33.6	0.02	1100	15	0.048	0.45	3.24	21500	0.2	0.002	261	0.001	2.5	0.1	16.4
Maximum	4.64	33.6	0.02	1100	15	0.048	0.45	3.24	21500	0.2	0.002	261	0.001	2.5	0.1	16.4
% of values undetected											100%		100%	100%		
# of values between MDL and MRL			1							1					1	
Leymus mollis-TE19																
Sample Date																
09/14/07	3.3	40.3	0.6	1350	11.1	**0.009**	0.73	0.48	24800	**0.4**	**0.004**	817	**0.001**	**2.5**	**0.11**	10.6
Mean	3.3	40.3	0.6	1350	11.1	0.009	0.73	0.48	24800	0.4	0.004	817	0.001	2.5	0.11	10.6
Median	3.3	40.3	0.6	1350	11.1	0.009	0.73	0.48	24800	0.4	0.004	817	0.001	2.5	0.11	10.6
St. Deviation	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
# of values	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Minimum	3.3	40.3	0.6	1350	11.1	0.009	0.73	0.48	24800	0.4	0.004	817	0.001	2.5	0.11	10.6
Maximum	3.3	40.3	0.6	1350	11.1	0.009	0.73	0.48	24800	0.4	0.004	817	0.001	2.5	0.11	10.6
% of values undetected											100%		100%	100%		
# of values between MDL and MRL						1				1					1	

Appendix 35.1D. Vegetation Sample Results, Cook Inlet Drainages Study Area, 2004-2007

	Total Solids	Chloride	Fluoride	Sulfate	Total Cyanide	Ammonia	Aluminum	Antimony	Arsenic	Barium	Beryllium	Bismuth	Boron	Cadmium	Calcium	Chromium	Cobalt
Species - Location ID	percent	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Oplopanax horridus-Berry-TE19																	
Sample Date																	
08/29/06	25.3				**0.08**		2.5	**0.04**	**0.025**	0.9	**0.01**	**0.022**	20.3	**0.01**	1660	**0.5**	0.093
Mean	25.3				0.08		2.5	0.04	0.025	0.9	0.01	0.022	20.3	0.01	1660	0.5	0.093
Median	25.3				0.08		2.5	0.04	0.025	0.9	0.01	0.022	20.3	0.01	1660	0.5	0.093
St. Deviation	NA				NA		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
# of values	1	0	0	0	1	0	1	1	1	1	1	1	1	1	1	1	1
Minimum	25.3	0	0	0	0.08	0	2.5	0.04	0.025	0.9	0.01	0.022	20.3	0.01	1660	0.5	0.093
Maximum	25.3	0	0	0	0.08	0	2.5	0.04	0.025	0.9	0.01	0.022	20.3	0.01	1660	0.5	0.093
% of values undetected					100%				100%		100%			100%		100%	
# of values between MDL and MRL								1				1					
Oplopanax horridus-TE19																	
Sample Date																	
08/18/04	26.7	3150	19.2	5670	**0.15**	1060	25.3	**0.01**	**0.025**	15.1	**0.0015**	**0.0035**	40.6	**0.03**	15300	**0.3**	0.26
08/29/06	26.9				**0.31**		34.8	**0.04**	**0.06**	6.3	**0.002**	**0.0015**	22.9	**0.01**	13000	**0.5**	0.138
09/14/07	17				**0.84**		16.9	**0.04**	**0.07**	5.19	**0.003**	**0.05**	28.5	0.073	11900	**0.35**	0.125
Mean	23.5	3150	19.2	5670	0.43	1060	25.7	0.03	0.052	8.9	0.0022	0.018	30.7	0.038	13400	0.38	0.174
Median	26.7	3150	19.2	5670	0.31	1060	25.3	0.04	0.06	6.3	0.002	0.0035	28.5	0.03	13000	0.35	0.138
St. Deviation	5.7	NA	NA	NA	0.36	NA	9	0.017	0.024	5.4	0.0008	0.027	9	0.032	1700	0.1	0.074
# of values	3	1	1	1	3	1	3	3	3	3	3	3	3	3	3	3	3
Minimum	17	3150	19.2	5670	0.15	1060	16.9	0.01	0.025	5.19	0.0015	0.0015	22.9	0.01	11900	0.3	0.125
Maximum	26.9	3150	19.2	5670	0.84	1060	34.8	0.04	0.07	15.1	0.003	0.05	40.6	0.073	15300	0.5	0.26
% of values undetected					33%			33%	33%		100%	100%		33%		67%	
# of values between MDL and MRL					2			2	2					1		1	
Ptilium crista-castrensis-TE18																	
Sample Date																	
08/18/04	85.8	**13.1**	5.8	21	**0.15**	**3.8**	1140	0.05	**0.25**	8.4	**0.008**	**0.013**	**2.5**	**0.035**	1210	2.2	0.37
08/29/06	23.2				**0.40**		8390	**0.02**	1.65	41.4	0.046	**0.0255**	**4.8**	0.091	7500	90.2	2.92
09/14/07	9.14				**0.385**		230	0.06	**0.07**	22.3	**0.003**	**0.051**	**3.7**	0.087	4140	2.4	0.2
Mean	39.4	13.1	5.8	21	0.31	3.8	3250	0.043	0.7	24	0.019	0.03	3.67	0.071	4280	32	1.2
Median	23.2	13.1	5.8	21	0.385	3.8	1140	0.05	0.25	22.3	0.008	0.0255	3.7	0.087	4140	2.4	0.37
St. Deviation	40.8	NA	NA	NA	0.14	NA	4470	0.021	0.9	16.6	0.024	0.019	1.15	0.031	3150	51	1.5
# of values	3	1	1	1	3	1	3	3	3	3	3	3	3	3	3	3	3
Minimum	9.14	13.1	5.8	21	0.15	3.8	230	0.02	0.07	8.4	0.003	0.013	2.5	0.035	1210	2.2	0.2
Maximum	85.8	13.1	5.8	21	0.4	3.8	8390	0.06	1.65	41.4	0.046	0.051	4.8	0.091	7500	90.2	2.92
% of values undetected					67%			33%			33%	67%	33%				
# of values between MDL and MRL		1			1	1			2		1	1	2	1			

Appendix 35.1D. Vegetation Sample Results, Cook Inlet Drainages Study Area, 2004-2007

	Copper	Iron	Lead	Magnesium	Manganese	Mercury	Molybdenum	Nickel	Potassium	Selenium	Silver	Sodium	Thallium	Tin	Vanadium	Zinc
Species - Location ID	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Oplopanax horridus-Berry-TE19																
Sample Date																
08/29/06	7.76	26.9	**0.01**	1440	65	**0.005**	0.21	1.85	17900	**0.05**	**0.009**	178	**0.01**	**10.05**	**0.01**	19.3
Mean	7.76	26.9	0.01	1440	65	0.005	0.21	1.85	17900	0.05	0.009	178	0.01	10.05	0.01	19.3
Median	7.76	26.9	0.01	1440	65	0.005	0.21	1.85	17900	0.05	0.009	178	0.01	10.05	0.01	19.3
St. Deviation	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
# of values	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Minimum	7.76	26.9	0.01	1440	65	0.005	0.21	1.85	17900	0.05	0.009	178	0.01	10.05	0.01	19.3
Maximum	7.76	26.9	0.01	1440	65	0.005	0.21	1.85	17900	0.05	0.009	178	0.01	10.05	0.01	19.3
% of values undetected			100%							100%			100%	100%	100%	
# of values between MDL and MRL						1					1					
Oplopanax horridus-TE19																
Sample Date																
08/18/04	7.02	58.2	0.06	6740	570	0.064	0.15	2.98	14200	**0.05**	**0.0015**	2470	**0.001**	**2.5**	0.23	38.7
08/29/06	5.34	73.3	0.06	4540	468	0.024	0.23	1.12	13000	**0.1**	**0.007**	5320	**0.01**	**9.95**	**0.14**	27.9
09/14/07	8	48.1	0.54	3850	90.4	0.028	0.28	1.98	11200	**0.1**	**0.004**	15100	**0.003**	**2.5**	**0.15**	26.2
Mean	6.79	59.9	0.22	5040	376	0.039	0.22	2.03	12800	0.08	0.0042	7600	0.005	5	0.17	30.9
Median	7.02	58.2	0.06	4540	468	0.028	0.23	1.98	13000	0.1	0.004	5320	0.003	2.5	0.15	27.9
St. Deviation	1.35	12.7	0.28	1510	253	0.022	0.07	0.93	1500	0.03	0.0028	6600	0.005	4.3	0.05	6.8
# of values	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Minimum	5.34	48.1	0.06	3850	90.4	0.024	0.15	1.12	11200	0.05	0.0015	2470	0.001	2.5	0.14	26.2
Maximum	8	73.3	0.54	6740	570	0.064	0.28	2.98	14200	0.1	0.007	15100	0.01	9.95	0.23	38.7
% of values undetected										100%	67%		67%	100%		
# of values between MDL and MRL											1		1		2	
Ptilium crista-castrensis-TE18																
Sample Date																
08/18/04	3.26	1010	2.17	768	32.2	0.121	0.06	21.3	537	**0.4**	**0.007**	124	**0.014**	**2.5**	2.13	7.4
08/29/06	19.1	11100	1.32	3340	250	0.041	0.11	209	4200	**0.3**	**0.012**	424	0.02	**10.05**	19	31.7
09/14/07	11.6	262	2.02	1960	235	0.041	0.11	2.04	7160	**0.1**	**0.012**	163	**0.009**	**2.55**	0.55	35.9
Mean	11.3	4100	1.84	2020	172	0.07	0.09	77	3970	0.27	0.01	237	0.014	5	7	25.0
Median	11.6	1010	2.02	1960	235	0.041	0.11	21.3	4200	0.3	0.012	163	0.014	2.55	2.13	31.7
St. Deviation	7.9	6100	0.45	1290	122	0.05	0.03	114	3320	0.15	0.003	163	0.006	4.3	10	15.4
# of values	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Minimum	3.26	262	1.32	768	32.2	0.041	0.06	2.04	537	0.1	0.007	124	0.009	2.5	0.55	7.4
Maximum	19.1	11100	2.17	3340	250	0.121	0.11	209	7160	0.4	0.012	424	0.02	10.05	19	35.9
% of values undetected										33%				100%		
# of values between MDL and MRL										2	3		2			

Appendix 35.1D. Vegetation Sample Results, Cook Inlet Drainages Study Area, 2004-2007

	Total Solids	Chloride	Fluoride	Sulfate	Total Cyanide	Ammonia	Aluminum	Antimony	Arsenic	Barium	Beryllium	Bismuth	Boron	Cadmium	Calcium	Chromium	Cobalt
Species - Location ID	percent	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Ptilium crista-castrensis-TE20																	
Sample Date																	
08/18/04	56.2	402	9.6	584	**0.15**	52.2	968	0.07	**0.15**	37.5	0.105	**0.0035**	**2.5**	0.075	4500	1.1	0.69
08/29/06	43				**0.22**		1220	**0.04**	**0.22**	28.1	**0.01**	**0.026**	**3.9**	0.11	3240	5.5	0.353
09/14/07	9.06				**0.345**		314	0.12	**0.1**	12.3	**0.003**	**0.049**	**3.6**	0.151	3340	**1.4**	0.308
Mean	36.1	402	9.6	584	0.24	52.2	830	0.08	0.16	26	0.04	0.026	3.33	0.11	3690	2.7	0.45
Median	43	402	9.6	584	0.22	52.2	968	0.07	0.15	28.1	0.01	0.026	3.6	0.11	3340	1.4	0.353
St. Deviation	24.3	NA	NA	NA	0.1	NA	470	0.04	0.06	12.7	0.06	0.023	0.74	0.04	700	2.5	0.209
# of values	3	1	1	1	3	1	3	3	3	3	3	3	3	3	3	3	3
Minimum	9.06	402	9.6	584	0.15	52.2	314	0.04	0.1	12.3	0.003	0.0035	2.5	0.075	3240	1.1	0.308
Maximum	56.2	402	9.6	584	0.345	52.2	1220	0.12	0.22	37.5	0.105	0.049	3.9	0.151	4500	5.5	0.69
% of values undetected					67%						67%	67%	33%				
# of values between MDL and MRL					1			1	3			1	2			1	
Ptilium crista-castrensis-TE21																	
Sample Date																	
08/28/04	28.7	48	**0.35**	72	**0.7**	**3.75**	339	0.08	**0.18**	1.9	**0.006**	**0.0035**	**2.45**	**0.026**	818	1.6	0.16
08/28/06	22				**0.29**		75.1	**0.02**	**0.025**	34.2	**0.01**	0.049	**9.9**	**0.01**	4860	**0.5**	0.032
09/13/07	11.2				**0.255**		935	0.11	**0.26**	39.9	**0.006**	**0.011**	**3.2**	**0.048**	5060	2.8	0.234
Mean	20.6	48	0.35	72	0.42	3.75	450	0.07	0.16	25.3	0.007	0.021	5.18	0.028	3580	1.6	0.14
Median	22	48	0.35	72	0.29	3.75	339	0.08	0.18	34.2	0.006	0.011	3.2	0.026	4860	1.6	0.16
St. Deviation	8.8	NA	NA	NA	0.25	NA	441	0.05	0.12	20.5	0.002	0.024	4.1	0.019	2390	1.2	0.1
# of values	3	1	1	1	3	1	3	3	3	3	3	3	3	3	3	3	3
Minimum	11.2	48	0.35	72	0.255	3.75	75.1	0.02	0.025	1.9	0.006	0.0035	2.45	0.01	818	0.5	0.032
Maximum	28.7	48	0.35	72	0.7	3.75	935	0.11	0.26	39.9	0.01	0.049	9.9	0.048	5060	2.8	0.234
% of values undetected			100%		67%	100%		33%	33%		33%	33%	33%	33%		33%	
# of values between MDL and MRL					1				2		2	1	2	2			
Ptilium crista-castrensis-TE23																	
Sample Date																	
08/29/06	20.7				**0.7**		2020	**0.04**	0.51	37.1	**0.01**	**0.05**	**11.3**	0.837	10100	6.1	1.34
09/13/07	9.46				**0.33**		456	0.11	**0.18**	17.8	**0.003**	**0.023**	**2.5**	0.166	5550	**1.1**	0.376
Mean	15.1				0.5		1240	0.1	0.35	27.5	0.007	0.04	7	0.502	7800	3.6	0.86
Median	15.1				0.5		1240	0.1	0.35	27.5	0.007	0.04	7	0.502	7800	3.6	0.86
St. Deviation	7.9				0.3		1110	0	0.23	13.6	0.005	0.02	6	0.474	3200	3.5	0.68
# of values	2	0	0	0	2	0	2	2	2	2	2	2	2	2	2	2	2
Minimum	9.46	0	0	0	0.33	0	456	0.04	0.18	17.8	0.003	0.023	2.5	0.166	5550	1.1	0.376
Maximum	20.7	0	0	0	0.7	0	2020	0.11	0.51	37.1	0.01	0.05	11.3	0.837	10100	6.1	1.34
% of values undetected					50%						100%						
# of values between MDL and MRL					1			1	1			2	2			1	

Appendix 35.1D. Vegetation Sample Results, Cook Inlet Drainages Study Area, 2004-2007

	Copper	Iron	Lead	Magnesium	Manganese	Mercury	Molybdenum	Nickel	Potassium	Selenium	Silver	Sodium	Thallium	Tin	Vanadium	Zinc
Species - Location ID	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Ptilium crista-castrensis-TE20																
Sample Date																
08/18/04	4.36	354	1.09	1480	162	0.085	0.52	4.39	3440	**0.2**	**0.009**	317	**0.019**	**2.5**	0.88	20.7
08/29/06	6.54	1170	1.1	1410	304	0.064	0.21	21.2	3690	**0.3**	**0.014**	382	0.03	**1.5**	1.96	29.6
09/14/07	3.3	604	1.24	2610	289	0.046	0.09	1.1	6830	**0.1**	**0.009**	402	**0.008**	**5.8**	0.96	31.9
Mean	4.73	710	1.14	1830	252	0.065	0.27	8.9	4650	0.2	0.011	367	0.019	3.3	1.3	27.4
Median	4.36	604	1.1	1480	289	0.064	0.21	4.39	3690	0.2	0.009	382	0.019	2.5	0.96	29.6
St. Deviation	1.65	420	0.08	670	78	0.02	0.22	10.8	1890	0.1	0.003	44	0.011	2.3	0.6	5.9
# of values	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Minimum	3.3	354	1.09	1410	162	0.046	0.09	1.1	3440	0.1	0.009	317	0.008	1.5	0.88	20.7
Maximum	6.54	1170	1.24	2610	304	0.085	0.52	21.2	6830	0.3	0.014	402	0.03	5.8	1.96	31.9
% of values undetected										33%				67%		
# of values between MDL and MRL										2	3		2	1		
Ptilium crista-castrensis-TE21																
Sample Date																
08/28/04	1.7	405	1.07	881	7.57	0.119	0.06	5.82	430	**0.3**	**0.008**	319	**0.007**	**2.45**	0.95	7.6
08/28/06	3.01	29.7	0.05	1360	887	0.109	**0.025**	1.47	4580	**0.05**	0.023	24.4	**0.01**	**9.9**	**0.03**	17.6
09/13/07	3.94	1050	1.45	1970	456	0.077	0.17	1.64	4270	**0.4**	**0.015**	262	0.03	**2.5**	1.13	21.1
Mean	2.88	490	0.86	1400	450	0.102	0.09	2.98	3090	0.25	0.015	202	0.016	5	0.7	15.4
Median	3.01	405	1.07	1360	456	0.109	0.06	1.64	4270	0.3	0.015	262	0.01	2.5	0.95	17.6
St. Deviation	1.13	520	0.72	550	440	0.022	0.08	2.46	2310	0.18	0.008	156	0.013	4.3	0.6	7
# of values	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Minimum	1.7	29.7	0.05	881	7.57	0.077	0.025	1.47	430	0.05	0.008	24.4	0.007	2.45	0.03	7.6
Maximum	3.94	1050	1.45	1970	887	0.119	0.17	5.82	4580	0.4	0.023	319	0.03	9.9	1.13	21.1
% of values undetected							33%			33%			33%	100%		
# of values between MDL and MRL										2	2		1		1	
Ptilium crista-castrensis-TE23																
Sample Date																
08/29/06	10.1	2120	1.75	2220	403	0.044	0.29	15.7	6790	**0.4**	**0.014**	267	0.03	**4.3**	3.76	99.2
09/13/07	9.65	525	0.93	1910	197	0.041	0.14	1.31	9860	**0.1**	0.025	163	**0.008**	**2.45**	1.27	36.3
Mean	9.9	1320	1.3	2070	300	0.043	0.22	8.5	8330	0.25	0.02	215	0.019	3.4	2.52	67.8
Median	9.9	1320	1.3	2070	300	0.043	0.22	8.5	8330	0.25	0.02	215	0.019	3.4	2.52	67.8
St. Deviation	0.3	1130	0.6	220	146	0.002	0.11	10.2	2170	0.21	0.008	74	0.016	1.3	1.76	44.5
# of values	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Minimum	9.65	525	0.93	1910	197	0.041	0.14	1.31	6790	0.1	0.014	163	0.008	2.45	1.27	36.3
Maximum	10.1	2120	1.75	2220	403	0.044	0.29	15.7	9860	0.4	0.025	267	0.03	4.3	3.76	99.2
% of values undetected										50%				50%		
# of values between MDL and MRL										1	1		1	1		

Appendix 35.1D. Vegetation Sample Results, Cook Inlet Drainages Study Area, 2004-2007

	Total Solids	Chloride	Fluoride	Sulfate	Total Cyanide	Ammonia	Aluminum	Antimony	Arsenic	Barium	Beryllium	Bismuth	Boron	Cadmium	Calcium	Chromium	Cobalt
Species - Location ID	percent	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Ptilium crista-castrensis-TE24																	
Sample Date																	
08/30/06	10.9				**0.80**		359	0.09	**0.13**	28.5	**0.01**	**0.01**	**3.2**	0.154	3570	**0.5**	0.147
Mean	10.9				0.8		359	0.09	0.13	28.5	0.01	0.01	3.2	0.154	3570	0.5	0.147
Median	10.9				0.8		359	0.09	0.13	28.5	0.01	0.01	3.2	0.154	3570	0.5	0.147
St. Deviation	NA				NA		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
# of values	1	0	0	0	1	0	1	1	1	1	1	1	1	1	1	1	1
Minimum	10.9	0	0	0	0.8	0	359	0.09	0.13	28.5	0.01	0.01	3.2	0.154	3570	0.5	0.147
Maximum	10.9	0	0	0	0.8	0	359	0.09	0.13	28.5	0.01	0.01	3.2	0.154	3570	0.5	0.147
% of values undetected											100%					100%	
# of values between MDL and MRL					1				1			1	1				
Rubus spectabilis-Berry-TE24																	
Sample Date																	
08/30/06	14.9				**0.44**		2.7	**0.02**	**0.03**	1.02	**0.002**	**0.01**	**8.2**	**0.005**	712	**0.5**	**0.01**
Mean	14.9				0.44		2.7	0.02	0.03	1.02	0.002	0.01	8.2	0.005	712	0.5	0.01
Median	14.9				0.44		2.7	0.02	0.03	1.02	0.002	0.01	8.2	0.005	712	0.5	0.01
St. Deviation	NA				NA		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
# of values	1	0	0	0	1	0	1	1	1	1	1	1	1	1	1	1	1
Minimum	14.9	0	0	0	0.44	0	2.7	0.02	0.03	1.02	0.002	0.01	8.2	0.005	712	0.5	0.01
Maximum	14.9	0	0	0	0.44	0	2.7	0.02	0.03	1.02	0.002	0.01	8.2	0.005	712	0.5	0.01
% of values undetected								100%	100%		100%					100%	
# of values between MDL and MRL					1							1	1	1			1
Rubus spectabilis-TE19																	
Sample Date																	
08/18/04	31.7	4840	19.1	677	3.0	475	27	**0.01**	**0.06**	2.1	**0.0015**	**0.0035**	48.9	**0.0035**	7630	**0.4**	0.16
09/14/07	27.1				**0.145**		15.5	**0.015**	**0.025**	3.14	**0.003**	**0.0025**	57.5	0.097	8570	**0.35**	0.111
Mean	29.4	4840	19.1	677	1.6		21	0.01	0.04	2.6	0.002	0.003	53.2	0.05	8100	0.4	0.14
Median	29.4	4840	19.1	677	1.6		21	0.01	0.04	2.6	0.002	0.003	53.2	0.05	8100	0.4	0.14
St. Deviation	3.3	NA	NA	NA	2		8	0	0.02	0.7	0.001	0.0007	6.1	0.066	660	0	0.03
# of values	2	1	1	1	2	1	2	2	2	2	2	2	2	2	2	2	2
Minimum	27.1	4840	19.1	677	0.145	475	15.5	0.01	0.025	2.1	0.0015	0.0025	48.9	0.0035	7630	0.35	0.111
Maximum	31.7	4840	19.1	677	3	475	27	0.015	0.06	3.14	0.003	0.0035	57.5	0.097	8570	0.4	0.16
% of values undetected					50%			100%	50%		100%	100%		50%		50%	
# of values between MDL and MRL									1							1	

Appendix 35.1D. Vegetation Sample Results, Cook Inlet Drainages Study Area, 2004-2007

	Copper	Iron	Lead	Magnesium	Manganese	Mercury	Molybdenum	Nickel	Potassium	Selenium	Silver	Sodium	Thallium	Tin	Vanadium	Zinc
Species - Location ID	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Ptilium crista-castrensis-TE24																
Sample Date																
08/30/06	5.28	344	1.7	1170	283	0.056	0.09	3.27	3760	**0.3**	**0.011**	125	0.03	**3.8**	0.64	40.7
Mean	5.28	344	1.7	1170	283	0.056	0.09	3.27	3760	0.3	0.011	125	0.03	3.8	0.64	40.7
Median	5.28	344	1.7	1170	283	0.056	0.09	3.27	3760	0.3	0.011	125	0.03	3.8	0.64	40.7
St. Deviation	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
# of values	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Minimum	5.28	344	1.7	1170	283	0.056	0.09	3.27	3760	0.3	0.011	125	0.03	3.8	0.64	40.7
Maximum	5.28	344	1.7	1170	283	0.056	0.09	3.27	3760	0.3	0.011	125	0.03	3.8	0.64	40.7
% of values undetected																
# of values between MDL and MRL										1	1			1		
Rubus spectabilis-Berry-TE24																
Sample Date																
08/30/06	5.43	27.9	**0.025**	1200	90.2	**0.005**	**0.025**	1.16	11100	**0.1**	**0.003**	132	**0.005**	**9.85**	**0.01**	13
Mean	5.43	27.9	0.025	1200	90.2	0.005	0.025	1.16	11100	0.1	0.003	132	0.005	9.85	0.01	13
Median	5.43	27.9	0.025	1200	90.2	0.005	0.025	1.16	11100	0.1	0.003	132	0.005	9.85	0.01	13
St. Deviation	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
# of values	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Minimum	5.43	27.9	0.025	1200	90.2	0.005	0.025	1.16	11100	0.1	0.003	132	0.005	9.85	0.01	13
Maximum	5.43	27.9	0.025	1200	90.2	0.005	0.025	1.16	11100	0.1	0.003	132	0.005	9.85	0.01	13
% of values undetected			100%				100%			100%	100%		100%	100%	100%	
# of values between MDL and MRL						1										
Rubus spectabilis-TE19																
Sample Date																
08/18/04	3.5	63.2	0.05	5710	62.5	0.188	0.47	3.89	12400	**0.05**	**0.0015**	195	**0.001**	**2.5**	**0.16**	15.2
09/14/07	9.6	68.6	0.69	5940	328	0.028	0.93	2.02	6940	**0.1**	**0.004**	6670	**0.006**	**2.55**	**0.12**	32
Mean	6.6	65.9	0.4	5830	195	0.11	0.7	2.96	9700	0.08	0.003	3430	0.0035	2.5	0.14	24
Median	6.6	65.9	0.4	5830	195	0.11	0.7	2.96	9700	0.08	0.003	3430	0.0035	2.5	0.14	24
St. Deviation	4.3	3.8	0.5	160	188	0.11	0.33	1.32	3900	0.04	0.002	4580	0.0035	0	0.03	12
# of values	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Minimum	3.5	63.2	0.05	5710	62.5	0.028	0.47	2.02	6940	0.05	0.0015	195	0.001	2.5	0.12	15.2
Maximum	9.6	68.6	0.69	5940	328	0.188	0.93	3.89	12400	0.1	0.004	6670	0.006	2.55	0.16	32
% of values undetected										100%	100%		50%	100%		
# of values between MDL and MRL													1		2	

Appendix 35.1D. Vegetation Sample Results, Cook Inlet Drainages Study Area, 2004-2007

	Total Solids	Chloride	Fluoride	Sulfate	Total Cyanide	Ammonia	Aluminum	Antimony	Arsenic	Barium	Beryllium	Bismuth	Boron	Cadmium	Calcium	Chromium	Cobalt
Species - Location ID	percent	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Rubus spectabilis-TE20																	
Sample Date																	
08/18/04	32.6	7220	17.3	4450	**0.15**	403	27.7	0.07	**0.025**	20.9	**0.0015**	**0.0035**	35.6	**0.039**	7940	**0.15**	0.16
08/29/06	34.2				**0.06**		32.9	0.05	**0.025**	13.7	**0.01**	**0.0015**	49.3	**0.025**	6300	**0.5**	0.051
09/14/07	29.8				**0.125**		43.8	0.07	**0.025**	12.7	**0.003**	**0.0025**	43.6	0.075	5420	**0.35**	0.069
Mean	32.2	7220	17.3	4450	0.11	403	34.8	0.063	0.025	15.8	0.005	0.0025	42.8	0.046	6550	0.33	0.09
Median	32.6	7220	17.3	4450	0.125	403	32.9	0.07	0.025	13.7	0.003	0.0025	43.6	0.039	6300	0.35	0.069
St. Deviation	2.2	NA	NA	NA	0.05	NA	8.2	0.012	0	4.5	0.005	0.001	6.9	0.026	1280	0.18	0.06
# of values	3	1	1	1	3	1	3	3	3	3	3	3	3	3	3	3	3
Minimum	29.8	7220	17.3	4450	0.06	403	27.7	0.05	0.025	12.7	0.0015	0.0015	35.6	0.025	5420	0.15	0.051
Maximum	34.2	7220	17.3	4450	0.15	403	43.8	0.07	0.025	20.9	0.01	0.0035	49.3	0.075	7940	0.5	0.16
% of values undetected					100%				100%		100%	100%				100%	
# of values between MDL and MRL														2			
Rubus spectabilis-TE24																	
Sample Date																	
08/30/06	28.2				**0.36**		54.5	**0.02**	**0.025**	7.37	**0.01**	**0.0015**	35	**0.02**	3410	**0.5**	0.027
09/13/07	30.3				**0.43**		34.8	**0.04**	**0.025**	5.55	**0.003**	**0.0025**	32.8	**0.018**	5330	**0.35**	0.043
Mean	29.3				0.4		44.7	0.03	0.025	6.46	0.007	0.002	34	0.02	4370	0.4	0.035
Median	29.3				0.4		44.7	0.03	0.025	6.46	0.007	0.002	34	0.02	4370	0.4	0.035
St. Deviation	1.5				0.05		13.9	0.014	0	1.29	0.005	0.0007	2	0	1360	0.1	0.011
# of values	2	0	0	0	2	0	2	2	2	2	2	2	2	2	2	2	2
Minimum	28.2	0	0	0	0.36	0	34.8	0.02	0.025	5.55	0.003	0.0015	32.8	0.018	3410	0.35	0.027
Maximum	30.3	0	0	0	0.43	0	54.5	0.04	0.025	7.37	0.01	0.0025	35	0.02	5330	0.5	0.043
% of values undetected					50%			50%	100%		100%	100%				100%	
# of values between MDL and MRL					1			1						2			
Salix sp.-TE23																	
Sample Date																	
08/29/06	35.1				1.6		18.8	**0.02**	**0.025**	10.8	**0.01**	**0.007**	**16.2**	1.41	12300	**0.5**	1.13
09/13/07	36.2				**0.33**		9.2	**0.04**	**0.06**	13.3	**0.003**	**0.0025**	22.9	2.7	14300	**0.35**	1.3
Mean	35.7				1		14	0.03	0.04	12.1	0.007	0.005	19.6	2.1	13300	0.4	1.2
Median	35.7				1		14	0.03	0.04	12.1	0.007	0.005	19.6	2.1	13300	0.4	1.2
St. Deviation	0.8				0.9		7	0.014	0.02	1.8	0.005	0.003	4.7	0.9	1400	0.1	0.1
# of values	2	0	0	0	2		2	2	2	2	2	2	2	2	2	2	2
Minimum	35.1	0	0	0	0.33	0	9.2	0.02	0.025	10.8	0.003	0.0025	16.2	1.41	12300	0.35	1.13
Maximum	36.2	0	0	0	1.6	0	18.8	0.04	0.06	13.3	0.01	0.007	22.9	2.7	14300	0.5	1.3
% of values undetected								50%	50%		100%	50%				100%	
# of values between MDL and MRL					1			1	1			1	1				

Appendix 35.1D. Vegetation Sample Results, Cook Inlet Drainages Study Area, 2004-2007

Species - Location ID	Copper mg/kg	Iron mg/kg	Lead mg/kg	Magnesium mg/kg	Manganese mg/kg	Mercury mg/kg	Molybdenum mg/kg	Nickel mg/kg	Potassium mg/kg	Selenium mg/kg	Silver mg/kg	Sodium mg/kg	Thallium mg/kg	Tin mg/kg	Vanadium mg/kg	Zinc mg/kg
Rubus spectabilis-TE20																
Sample Date																
08/18/04	5.95	66.1	0.11	5510	324	0.079	2.48	2.74	12800	**0.1**	**0.007**	2580	**0.001**	**2.5**	**0.14**	16.7
08/29/06	5.87	78.8	0.06	5350	429	0.023	1.58	5.77	11700	**0.1**	**0.003**	2920	**0.01**	**10.05**	**0.06**	13.8
09/14/07	6.8	71.4	0.59	4130	313	0.02	2.78	1.47	11100	**0.1**	**0.004**	3570	**0.002**	**2.55**	**0.13**	14.2
Mean	6.21	72.1	0.25	5000	355	0.041	2.28	3.33	11900	0.1	0.0047	3020	0.004	5	0.11	14.9
Median	5.95	71.4	0.11	5350	324	0.023	2.48	2.74	11700	0.1	0.004	2920	0.002	2.55	0.13	14.2
St. Deviation	0.52	6.4	0.29	750	64	0.033	0.62	2.21	900	0	0.0021	500	0.005	4.3	0.04	1.6
# of values	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Minimum	5.87	66.1	0.06	4130	313	0.02	1.58	1.47	11100	0.1	0.003	2580	0.001	2.5	0.06	13.8
Maximum	6.8	78.8	0.59	5510	429	0.079	2.78	5.77	12800	0.1	0.007	3570	0.01	10.05	0.14	16.7
% of values undetected										33%	67%		67%	100%		
# of values between MDL and MRL										2	1		1		3	
Rubus spectabilis-TE24																
Sample Date																
08/30/06	6.02	71.5	0.09	2470	428	0.053	0.05	1.2	16000	**0.05**	**0.003**	424	**0.01**	**4.4**	**0.04**	17.5
09/13/07	3.42	58	0.07	4030	481	0.047	**0.025**	0.68	11400	**0.1**	**0.004**	253	**0.001**	**2.5**	**0.16**	14.4
Mean	4.72	65	0.08	3250	455	0.05	0.04	0.9	13700	0.08	0.0035	339	0.006	3.5	0.1	16
Median	4.72	65	0.08	3250	455	0.05	0.04	0.9	13700	0.08	0.0035	339	0.006	3.5	0.1	16
St. Deviation	1.84	10	0.014	1100	37	0.004	0.02	0.4	3300	0.04	0.0007	121	0.006	1.3	0.1	2.2
# of values	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Minimum	3.42	58	0.07	2470	428	0.047	0.025	0.68	11400	0.05	0.003	253	0.001	2.5	0.04	14.4
Maximum	6.02	71.5	0.09	4030	481	0.053	0.05	1.2	16000	0.1	0.004	424	0.01	4.4	0.16	17.5
% of values undetected							50%			100%	100%		100%	50%		
# of values between MDL and MRL														1	2	
Salix sp.-TE23																
Sample Date																
08/29/06	6.54	47.5	0.05	2340	126	0.026	0.18	5.17	15800	**0.05**	**0.003**	36.9	**0.01**	**6.2**	**0.02**	123
09/13/07	4.66	42.9	0.07	2950	163	0.026	0.26	3.81	12300	**0.1**	**0.004**	95	**0.003**	**5.2**	**0.11**	148
Mean	5.6	45.2	0.06	2650	145	0.026	0.22	4.49	14100	0.08	0.0035	66	0.007	5.7	0.1	136
Median	5.6	45.2	0.06	2650	145	0.026	0.22	4.49	14100	0.08	0.0035	66	0.007	5.7	0.1	136
St. Deviation	1.33	3.3	0.014	430	26	0	0.06	0.96	2500	0.04	0.0007	41	0.005	0.7	0.1	18
# of values	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Minimum	4.66	42.9	0.05	2340	126	0.026	0.18	3.81	12300	0.05	0.003	36.9	0.003	5.2	0.02	123
Maximum	6.54	47.5	0.07	2950	163	0.026	0.26	5.17	15800	0.1	0.004	95	0.01	6.2	0.11	148
% of values undetected										100%	100%		50%			
# of values between MDL and MRL													1	2	2	

Appendix 35.1D. Vegetation Sample Results, Cook Inlet Drainages Study Area, 2004-2007

	Total Solids	Chloride	Fluoride	Sulfate	Total Cyanide	Ammonia	Aluminum	Antimony	Arsenic	Barium	Beryllium	Bismuth	Boron	Cadmium	Calcium	Chromium	Cobalt
Species - Location ID	percent	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Salix sp.-TE24																	
Sample Date																	
08/30/06	31.4				1.0		11.6	**0.04**	**0.025**	6.75	**0.01**	**0.0015**	**12.7**	0.388	2750	**0.5**	0.033
Mean	31.4				1		11.6	0.04	0.025	6.75	0.01	0.0015	12.7	0.388	2750	0.5	0.033
Median	31.4				1		11.6	0.04	0.025	6.75	0.01	0.0015	12.7	0.388	2750	0.5	0.033
St. Deviation	NA				NA		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
# of values	1	0	0	0	1	0	1	1	1	1	1	1	1	1	1	1	1
Minimum	31.4	0	0	0	1	0	11.6	0.04	0.025	6.75	0.01	0.0015	12.7	0.388	2750	0.5	0.033
Maximum	31.4	0	0	0	1	0	11.6	0.04	0.025	6.75	0.01	0.0015	12.7	0.388	2750	0.5	0.033
% of values undetected									100%		100%	100%				100%	
# of values between MDL and MRL								1					1				
Sambucus racemosa-TE19																	
Sample Date																	
08/18/04	22.1	2940	19.4	7330	**0.15**	554	32.9	**0.04**	**0.025**	9.7	**0.0015**	**0.0035**	36.8	**0.0035**	8060	**0.4**	0.1
08/29/06	26.2				**0.08**		12.7	**0.04**	**0.025**	57.7	**0.01**	**0.007**	44.6	**0.01**	20600	**0.5**	0.096
09/14/07	20.1				1.4		14.5	**0.015**	**0.09**	11	**0.003**	**0.0505**	41.1	0.056	14200	**0.9**	0.107
Mean	22.8	2940	19.4	7330	0.5	554	20	0.032	0.047	26	0.005	0.02	40.8	0.023	14300	0.6	0.1
Median	22.1	2940	19.4	7330	0.15	554	14.5	0.04	0.025	11	0.003	0.007	41.1	0.01	14200	0.5	0.1
St. Deviation	3.1	NA	NA	NA	0.7	NA	11.2	0.014	0.038	27	0.005	0.026	3.9	0.029	6300	0.26	0.01
# of values	3	1	1	1	3	1	3	3	3	3	3	3	3	3	3	3	3
Minimum	20.1	2940	19.4	7330	0.08	554	12.7	0.015	0.025	9.7	0.0015	0.0035	36.8	0.0035	8060	0.4	0.096
Maximum	26.2	2940	19.4	7330	1.4	554	32.9	0.04	0.09	57.7	0.01	0.0505	44.6	0.056	20600	0.9	0.107
% of values undetected					67%			33%	67%		100%	67%		67%		33%	
# of values between MDL and MRL								2	1			1				2	
Spiraea stevenii-TE24																	
Sample Date																	
09/13/07	34.5				**0.345**		8.3	**0.015**	**0.025**	6.56	**0.003**	**0.0025**	13	0.529	3580	**0.35**	0.032
Mean	34.5				0.345		8.3	0.015	0.025	6.56	0.003	0.0025	13	0.529	3580	0.35	0.032
Median	34.5				0.345		8.3	0.015	0.025	6.56	0.003	0.0025	13	0.529	3580	0.35	0.032
St. Deviation	NA				NA		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
# of values	1	0	0	0	1	0	1	1	1	1	1	1	1	1	1	1	1
Minimum	34.5	0	0	0	0.345	0	8.3	0.015	0.025	6.56	0.003	0.0025	13	0.529	3580	0.35	0.032
Maximum	34.5	0	0	0	0.345	0	8.3	0.015	0.025	6.56	0.003	0.0025	13	0.529	3580	0.35	0.032
% of values undetected					100%			100%	100%		100%	100%				100%	
# of values between MDL and MRL																	

Appendix 35.1D. Vegetation Sample Results, Cook Inlet Drainages Study Area, 2004-2007

	Copper	Iron	Lead	Magnesium	Manganese	Mercury	Molybdenum	Nickel	Potassium	Selenium	Silver	Sodium	Thallium	Tin	Vanadium	Zinc
Species - Location ID	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Salix sp.-TE24																
Sample Date																
08/30/06	4.95	43.6	0.08	1520	1150	0.034	0.08	0.96	11500	**0.05**	**0.003**	26.2	0.08	4.1	**0.01**	78.6
Mean	4.95	43.6	0.08	1520	1150	0.034	0.08	0.96	11500	0.05	0.003	26.2	0.08	4.1	0.01	78.6
Median	4.95	43.6	0.08	1520	1150	0.034	0.08	0.96	11500	0.05	0.003	26.2	0.08	4.1	0.01	78.6
St. Deviation	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
# of values	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Minimum	4.95	43.6	0.08	1520	1150	0.034	0.08	0.96	11500	0.05	0.003	26.2	0.08	4.1	0.01	78.6
Maximum	4.95	43.6	0.08	1520	1150	0.034	0.08	0.96	11500	0.05	0.003	26.2	0.08	4.1	0.01	78.6
% of values undetected										100%	100%				100%	
# of values between MDL and MRL														1		
Sambucus racemosa-TE19																
Sample Date																
08/18/04	5.67	65.6	0.05	7550	53.3	0.075	0.36	1.3	23400	**0.1**	**0.003**	5180	**0.001**	**2.5**	0.2	18.9
08/29/06	4.99	55.9	0.05	2720	93.2	0.032	1.08	2.06	21600	**0.1**	**0.003**	1510	**0.01**	**9.8**	**0.1**	31.1
09/14/07	6	54	0.45	2590	15.1	0.034	1.2	2.37	10800	**0.2**	**0.004**	15900	**0.002**	**2.55**	0.26	17.7
Mean	5.55	58.5	0.18	4290	53.9	0.047	0.9	1.91	18600	0.13	0.0033	7500	0.004	5	0.19	22.6
Median	5.67	55.9	0.05	2720	53.3	0.034	1.08	2.06	21600	0.1	0.003	5180	0.002	2.55	0.2	18.9
St. Deviation	0.52	6.2	0.23	2830	39.1	0.024	0.5	0.55	6800	0.06	0.0006	7500	0.005	4.2	0.08	7.4
# of values	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Minimum	4.99	54	0.05	2590	15.1	0.032	0.36	1.3	10800	0.1	0.003	1510	0.001	2.5	0.1	17.7
Maximum	6	65.6	0.45	7550	93.2	0.075	1.2	2.37	23400	0.2	0.004	15900	0.01	9.8	0.26	31.1
% of values undetected											67%		67%	100%		
# of values between MDL and MRL										3	1		1		1	
Spiraea stevenii-TE24																
Sample Date																
09/13/07	4.47	34.5	0.07	2630	917	0.032	0.07	0.38	9230	**0.1**	**0.004**	54.9	0.1	**2.5**	**0.06**	62.4
Mean	4.47	34.5	0.07	2630	917	0.032	0.07	0.38	9230	0.1	0.004	54.9	0.1	2.5	0.06	62.4
Median	4.47	34.5	0.07	2630	917	0.032	0.07	0.38	9230	0.1	0.004	54.9	0.1	2.5	0.06	62.4
St. Deviation	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
# of values	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Minimum	4.47	34.5	0.07	2630	917	0.032	0.07	0.38	9230	0.1	0.004	54.9	0.1	2.5	0.06	62.4
Maximum	4.47	34.5	0.07	2630	917	0.032	0.07	0.38	9230	0.1	0.004	54.9	0.1	2.5	0.06	62.4
% of values undetected										100%	100%			100%		
# of values between MDL and MRL															1	

Appendix 35.1D. Vegetation Sample Results, Cook Inlet Drainages Study Area, 2004-2007

	Total Solids	Chloride	Fluoride	Sulfate	Total Cyanide	Ammonia	Aluminum	Antimony	Arsenic	Barium	Beryllium	Bismuth	Boron	Cadmium	Calcium	Chromium	Cobalt
Species - Location ID	percent	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Vaccinium uliginosum-Berry-TE20																	
Sample Date																	
08/29/06	10.7				**0.165**		11	0.06	**0.025**	7.1	**0.01**	**0.0015**	**8.8**	0.062	891	**0.5**	0.027
Mean	10.7				0.165		11	0.06	0.025	7.1	0.01	0.0015	8.8	0.062	891	0.5	0.027
Median	10.7				0.165		11	0.06	0.025	7.1	0.01	0.0015	8.8	0.062	891	0.5	0.027
St. Deviation	NA				NA		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
# of values	1	0	0	0	1	0	1	1	1	1	1	1	1	1	1	1	1
Minimum	10.7	0	0	0	0.165	0	11	0.06	0.025	7.1	0.01	0.0015	8.8	0.062	891	0.5	0.027
Maximum	10.7	0	0	0	0.165	0	11	0.06	0.025	7.1	0.01	0.0015	8.8	0.062	891	0.5	0.027
% of values undetected					100%				100%		100%	100%				100%	
# of values between MDL and MRL													1				
Vaccinium uliginosum-TE20																	
Sample Date																	
08/18/04	53.6	544	13.5	**192**	**0.15**	113	52.8	**0.01**	**0.025**	26	**0.0015**	**0.0035**	17.9	0.271	3610	**0.3**	0.1
08/29/06	45.6				**0.045**		52	0.05	**0.025**	29.2	**0.01**	**0.0015**	25.5	0.132	5130	**0.5**	0.075
09/14/07	43.2				**0.095**		47.7	**0.015**	**0.025**	24.1	**0.003**	**0.0025**	19.4	0.148	4460	**0.35**	0.086
Mean	47.5	544	13.5	192	0.1	113	50.8	0.025	0.025	26.4	0.005	0.0025	20.9	0.184	4400	0.38	0.09
Median	45.6	544	13.5	192	0.095	113	52	0.015	0.025	26	0.003	0.0025	19.4	0.148	4460	0.35	0.086
St. Deviation	5.4	NA	NA	NA	0.05	NA	2.7	0.022	0	2.6	0.005	0.001	4	0.076	760	0.1	0.01
# of values	3	1	1	1	3	1	3	3	3	3	3	3	3	3	3	3	3
Minimum	43.2	544	13.5	192	0.045	113	47.7	0.01	0.025	24.1	0.0015	0.0015	17.9	0.132	3610	0.3	0.075
Maximum	53.6	544	13.5	192	0.15	113	52.8	0.05	0.025	29.2	0.01	0.0035	25.5	0.271	5130	0.5	0.1
% of values undetected					100%			67%	100%		100%	100%				67%	
# of values between MDL and MRL				1												1	
Vaccinium uliginosum-TE24																	
Sample Date																	
08/30/06	29.3				**0.16**		40.8	**0.02**	**0.03**	21.5	**0.002**	**0.038**	**13.3**	**0.044**	5640	**0.5**	0.026
09/13/07	35.1				**0.11**		70.1	**0.04**	**0.025**	64.8	**0.003**	**0.0025**	**9.8**	0.095	6300	**0.35**	0.078
Mean	32.2				0.14		55.5	0.03	0.03	43.2	0.0025	0.02	12	0.07	5970	0.4	0.052
Median	32.2				0.14		55.5	0.03	0.03	43.2	0.0025	0.02	12	0.07	5970	0.4	0.052
St. Deviation	4.1				0.04		20.7	0.014	0	30.6	0.0007	0.025	2	0.036	470	0.1	0.037
# of values	2	0	0	0	2	0	2	2	2	2	2	2	2	2	2	2	2
Minimum	29.3	0	0	0	0.11	0	40.8	0.02	0.025	21.5	0.002	0.0025	9.8	0.044	5640	0.35	0.026
Maximum	35.1	0	0	0	0.16	0	70.1	0.04	0.03	64.8	0.003	0.038	13.3	0.095	6300	0.5	0.078
% of values undetected					50%			50%	100%		100%	50%				100%	
# of values between MDL and MRL					1			1				1	2	1			

Appendix 35.1D. Vegetation Sample Results, Cook Inlet Drainages Study Area, 2004-2007

	Copper	Iron	Lead	Magnesium	Manganese	Mercury	Molybdenum	Nickel	Potassium	Selenium	Silver	Sodium	Thallium	Tin	Vanadium	Zinc
Species - Location ID	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Vaccinium uliginosum-Berry-TE20																
Sample Date																
08/29/06	3.83	14.8	**0.01**	483	70.9	**0.008**	0.16	0.96	7120	**0.05**	**0.003**	192	**0.01**	**10.05**	**0.01**	16.1
Mean	3.83	14.8	0.01	483	70.9	0.008	0.16	0.96	7120	0.05	0.003	192	0.01	10.05	0.01	16.1
Median	3.83	14.8	0.01	483	70.9	0.008	0.16	0.96	7120	0.05	0.003	192	0.01	10.05	0.01	16.1
St. Deviation	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
# of values	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Minimum	3.83	14.8	0.01	483	70.9	0.008	0.16	0.96	7120	0.05	0.003	192	0.01	10.05	0.01	16.1
Maximum	3.83	14.8	0.01	483	70.9	0.008	0.16	0.96	7120	0.05	0.003	192	0.01	10.05	0.01	16.1
% of values undetected			100%							100%	100%		100%	100%	100%	
# of values between MDL and MRL						1										
Vaccinium uliginosum-TE20																
Sample Date																
08/18/04	4.97	34.8	0.17	1210	713	0.063	0.36	1.77	3640	**0.05**	**0.0015**	99.9	**0.003**	**2.45**	**0.1**	38.2
08/29/06	3.99	35.1	**0.03**	1770	360	0.029	0.13	2.27	6840	**0.05**	**0.003**	300	**0.01**	**9.85**	**0.01**	21.6
09/14/07	4	29	0.56	1450	224	0.019	0.12	1.22	6020	**0.1**	**0.004**	266	**0.003**	**2.45**	**0.14**	16.4
Mean	4.32	33	0.25	1480	432	0.037	0.2	1.75	5500	0.07	0.0028	222	0.005	4.92	0.08	25.4
Median	4	34.8	0.17	1450	360	0.029	0.13	1.77	6020	0.05	0.003	266	0.003	2.45	0.1	21.6
St. Deviation	0.56	3.4	0.27	280	252	0.023	0.14	0.53	1660	0.03	0.0013	107	0.004	4.27	0.07	11.4
# of values	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Minimum	3.99	29	0.03	1210	224	0.019	0.12	1.22	3640	0.05	0.0015	99.9	0.003	2.45	0.01	16.4
Maximum	4.97	35.1	0.56	1770	713	0.063	0.36	2.27	6840	0.1	0.004	300	0.01	9.85	0.14	38.2
% of values undetected										100%	100%		33%	100%	33%	
# of values between MDL and MRL			1										2		2	
Vaccinium uliginosum-TE24																
Sample Date																
08/30/06	3.43	32.8	1.51	1790	191	0.025	0.07	0.68	7580	**0.1**	0.03	35.9	**0.005**	**9.9**	**0.01**	19.8
09/13/07	6.95	31.3	0.19	1850	213	0.029	0.08	1.14	5190	**0.1**	**0.004**	48.5	**0.005**	**2.5**	**0.11**	28.7
Mean	5.19	32.1	0.9	1820	202	0.027	0.075	0.9	6390	0.1	0.017	42.2	0.005	6.2	0.1	24.3
Median	5.19	32.1	0.9	1820	202	0.027	0.075	0.9	6390	0.1	0.017	42.2	0.005	6.2	0.1	24.3
St. Deviation	2.49	1.1	0.9	40	16	0.003	0.007	0.3	1690	0	0.018	8.9	0	5.2	0.1	6.3
# of values	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Minimum	3.43	31.3	0.19	1790	191	0.025	0.07	0.68	5190	0.1	0.004	35.9	0.005	2.5	0.01	19.8
Maximum	6.95	32.8	1.51	1850	213	0.029	0.08	1.14	7580	0.1	0.03	48.5	0.005	9.9	0.11	28.7
% of values undetected										100%	50%		50%	100%	50%	
# of values between MDL and MRL													1		1	

Appendix 35.1D. Vegetation Sample Results, Cook Inlet Drainages Study Area, 2004-2007

	Total Solids	Chloride	Fluoride	Sulfate	Total Cyanide	Ammonia	Aluminum	Antimony	Arsenic	Barium	Beryllium	Bismuth	Boron	Cadmium	Calcium	Chromium	Cobalt
Species - Location ID	percent	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Vaccinium vitis-idaea-Berry-TE21																	
Sample Date																	
08/28/04	15.9	183	**0.7**	5330	**0.7**	39	63.6	**0.025**	**0.025**	4.7	**0.0015**	**0.0035**	8.1	**0.0035**	900	**0.3**	0.04
08/28/06	15.7				**0.40**		13.3	**0.04**	**0.025**	5.24	**0.01**	**0.031**	**9.7**	**0.01**	941	**0.5**	**0.011**
09/13/07	15.8				**0.23**		14.1	0.08	**0.025**	5.05	**0.003**	**0.006**	11.3	**0.003**	699	**1**	**0.015**
Mean	15.8	183	0.7	5330	0.44	39	30.3	0.048	0.025	5	0.005	0.014	9.7	0.006	847	0.6	0.022
Median	15.8	183	0.7	5330	0.4	39	14.1	0.04	0.025	5.05	0.003	0.006	9.7	0.0035	900	0.5	0.015
St. Deviation	0.1	NA	NA	NA	0.24	NA	28.8	0.028	0	0.27	0.005	0.015	1.6	0.004	130	0.4	0.016
# of values	3	1	1	1	3	1	3	3	3	3	3	3	3	3	3	3	3
Minimum	15.7	183	0.7	5330	0.23	39	13.3	0.025	0.025	4.7	0.0015	0.0035	8.1	0.003	699	0.3	0.011
Maximum	15.9	183	0.7	5330	0.7	39	63.6	0.08	0.025	5.24	0.01	0.031	11.3	0.01	941	1	0.04
% of values undetected			100%		67%			33%	100%		100%	33%		100%		33%	
# of values between MDL and MRL					1			1				2	1			2	2
Vaccinium vitis-idaea-Berry-TE22																	
Sample Date																	
08/29/04	17.4	**26**	**0.7**	3950	**0.7**	44	42.4	0.21	**0.025**	7	**0.0015**	**0.0035**	10.6	**0.0035**	896	**0.3**	0.03
08/28/06	16.2				**0.125**		15.6	**0.02**	**0.025**	6.97	**0.01**	**0.0015**	**10.1**	**0.01**	1120	**0.5**	**0.009**
09/13/07	14.7				**0.22**		12.3	0.13	**0.05**	6.15	**0.003**	**0.0025**	**9.5**	**0.014**	793	**0.8**	**0.019**
Mean	16.1	26	0.7	3950	0.35	44	23.4	0.12	0.033	6.71	0.005	0.0025	10.1	0.009	940	0.53	0.019
Median	16.2	26	0.7	3950	0.22	44	15.6	0.13	0.025	6.97	0.003	0.0025	10.1	0.01	896	0.5	0.019
St. Deviation	1.4	NA	NA	NA	0.31	NA	16.5	0.1	0.014	0.48	0.005	0.001	0.6	0.005	170	0.25	0.011
# of values	3	1	1	1	3	1	3	3	3	3	3	3	3	3	3	3	3
Minimum	14.7	26	0.7	3950	0.125	44	12.3	0.02	0.025	6.15	0.0015	0.0015	9.5	0.0035	793	0.3	0.009
Maximum	17.4	26	0.7	3950	0.7	44	42.4	0.21	0.05	7	0.01	0.0035	10.6	0.014	1120	0.8	0.03
% of values undetected			100%		100%			33%	67%		100%	100%		67%		33%	
# of values between MDL and MRL		1							1				2	1		2	2
Vaccinium vitis-idaea-TE21																	
Sample Date																	
08/28/04	44.7	131	**0.9**	174	**0.7**	**3.75**	98.5	**0.025**	**0.025**	49.5	**0.0015**	**0.0035**	12.2	**0.02**	6060	**0.15**	0.07
08/28/06	70.8				0.73		1050	**0.04**	**0.29**	15.9	**0.01**	**0.005**	**5.3**	0.052	3840	2.7	0.281
09/13/07	46.2				**0.085**		45.5	**0.015**	**0.025**	38.9	**0.003**	**0.0025**	14.3	**0.003**	6020	**0.35**	0.048
Mean	53.9	131	0.9	174	0.51	3.75	400	0.027	0.11	34.8	0.005	0.0037	10.6	0.025	5310	1.1	0.13
Median	46.2	131	0.9	174	0.7	3.75	98.5	0.025	0.025	38.9	0.003	0.0035	12.2	0.02	6020	0.35	0.07
St. Deviation	14.7	NA	NA	NA	0.36	NA	570	0.013	0.15	17.2	0.005	0.0013	4.7	0.025	1270	1.4	0.13
# of values	3	1	1	1	3	1	3	3	3	3	3	3	3	3	3	3	3
Minimum	44.7	131	0.9	174	0.085	3.75	45.5	0.015	0.025	15.9	0.0015	0.0025	5.3	0.003	3840	0.15	0.048
Maximum	70.8	131	0.9	174	0.73	3.75	1050	0.04	0.29	49.5	0.01	0.005	14.3	0.052	6060	2.7	0.281
% of values undetected					67%	100%		67%	67%		100%	67%		33%		67%	
# of values between MDL and MRL			1					1	1			1	1	1			

Appendix 35.1D. Vegetation Sample Results, Cook Inlet Drainages Study Area, 2004-2007

Species - Location ID	Copper	Iron	Lead	Magnesium	Manganese	Mercury	Molybdenum	Nickel	Potassium	Selenium	Silver	Sodium	Thallium	Tin	Vanadium	Zinc
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Vaccinium vitis-idaea-Berry-TE21																
Sample Date																
08/28/04	2.31	55	0.14	425	198	**0.017**	**0.025**	16.8	5340	**0.05**	**0.0015**	307	**0.004**	**2.45**	**0.11**	8.5
08/28/06	2.54	13.6	**0.01**	497	120	**0.017**	**0.025**	0.41	5410	**0.05**	**0.003**	81	**0.01**	**6.7**	**0.01**	6.3
09/13/07	2.49	9.4	0.05	321	99.9	**0.006**	0.13	0.58	4000	**0.1**	**0.004**	84.5	**0.001**	**2.45**	**0.1**	5.12
Mean	2.45	26	0.07	414	139	0.013	0.06	6	4920	0.07	0.0028	158	0.005	3.87	0.07	6.6
Median	2.49	13.6	0.05	425	120	0.017	0.025	0.58	5340	0.05	0.003	84.5	0.004	2.45	0.1	6.3
St. Deviation	0.12	25	0.07	88	52	0.006	0.06	9	790	0.03	0.0013	129	0.005	2.45	0.06	1.7
# of values	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Minimum	2.31	9.4	0.01	321	99.9	0.006	0.025	0.41	4000	0.05	0.0015	81	0.001	2.45	0.01	5.12
Maximum	2.54	55	0.14	497	198	0.017	0.13	16.8	5410	0.1	0.004	307	0.01	6.7	0.11	8.5
% of values undetected			33%				67%			100%	100%		67%	67%	33%	
# of values between MDL and MRL						3							1	1	2	
Vaccinium vitis-idaea-Berry-TE22																
Sample Date																
08/29/04	1.71	115	1.37	383	208	**0.013**	**0.025**	26.6	5040	**0.05**	**0.0015**	86.1	**0.001**	**2.5**	**0.1**	6.5
08/28/06	3.21	11.7	**0.01**	534	142	**0.01**	**0.025**	0.56	5440	**0.05**	**0.003**	82.8	**0.01**	**6**	**0.01**	6.6
09/13/07	1.84	11.2	0.07	357	137	**0.011**	0.14	0.63	4760	**0.1**	**0.004**	196	**0.001**	**2.55**	**0.12**	5.22
Mean	2.25	46	0.5	425	162	0.011	0.06	9	5080	0.07	0.0028	122	0.004	3.7	0.08	6.1
Median	1.84	11.7	0.07	383	142	0.011	0.025	0.63	5040	0.05	0.003	86.1	0.001	2.55	0.1	6.5
St. Deviation	0.83	60	0.8	96	40	0.002	0.07	15	340	0.03	0.0013	64	0.005	2	0.06	0.8
# of values	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Minimum	1.71	11.2	0.01	357	137	0.01	0.025	0.56	4760	0.05	0.0015	82.8	0.001	2.5	0.01	5.22
Maximum	3.21	115	1.37	534	208	0.013	0.14	26.6	5440	0.1	0.004	196	0.01	6	0.12	6.6
% of values undetected			33%				67%			100%	100%		100%	67%	33%	
# of values between MDL and MRL						3								1	2	
Vaccinium vitis-idaea-TE21																
Sample Date																
08/28/04	3.57	47.9	0.23	1360	1400	0.037	**0.025**	14.1	3730	**0.05**	**0.0015**	288	**0.001**	**2.5**	**0.11**	40.9
08/28/06	7.49	944	1.55	1760	302	**0.015**	0.12	8.4	3470	**0.4**	**0.009**	362	**0.01**	**10.1**	1.41	35.5
09/13/07	3.42	19.3	0.09	1320	809	0.024	0.13	1.03	4370	**0.1**	**0.004**	**32.2**	**0.004**	**2.45**	**0.12**	17.8
Mean	4.83	337	0.6	1480	840	0.025	0.09	7.8	3860	0.18	0.0048	227	0.005	5	0.5	31.4
Median	3.57	47.9	0.23	1360	809	0.024	0.12	8.4	3730	0.1	0.004	288	0.004	2.5	0.12	35.5
St. Deviation	2.31	526	0.8	240	550	0.011	0.06	6.6	460	0.19	0.0038	173	0.005	4.4	0.7	12.1
# of values	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Minimum	3.42	19.3	0.09	1320	302	0.015	0.025	1.03	3470	0.05	0.0015	32.2	0.001	2.45	0.11	17.8
Maximum	7.49	944	1.55	1760	1400	0.037	0.13	14.1	4370	0.4	0.009	362	0.01	10.1	1.41	40.9
% of values undetected							33%			67%	67%		67%	100%		
# of values between MDL and MRL						1				1	1	1	1		2	

Appendix 35.1D. Vegetation Sample Results, Cook Inlet Drainages Study Area, 2004-2007

	Total Solids	Chloride	Fluoride	Sulfate	Total Cyanide	Ammonia	Aluminum	Antimony	Arsenic	Barium	Beryllium	Bismuth	Boron	Cadmium	Calcium	Chromium	Cobalt
Species - Location ID	percent	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Vaccinium vitis-idaea-TE22																	
Sample Date																	
08/29/04	48.6	**29**	**0.3**	656	**0.7**	**3.75**	123	**0.025**	**0.025**	83.2	**0.0015**	**0.0035**	12.2	**0.0035**	7770	**0.25**	0.07
08/28/06	51.9				**0.04**		68.8	0.07	**0.025**	37.5	**0.01**	**0.0015**	**12.8**	**0.01**	5200	**0.5**	0.044
09/13/07	44.5				**0.075**		55.8	0.13	**0.025**	44.9	**0.003**	**0.0025**	15.2	**0.017**	6070	**0.8**	0.047
Mean	48.3	29	0.3	656	0.27	3.75	83	0.08	0.025	55.2	0.005	0.0025	13.4	0.01	6350	0.52	0.054
Median	48.6	29	0.3	656	0.075	3.75	68.8	0.07	0.025	44.9	0.003	0.0025	12.8	0.01	6070	0.5	0.047
St. Deviation	3.7	NA	NA	NA	0.37	NA	36	0.05	0	24.5	0.005	0.001	1.6	0.007	1310	0.28	0.014
# of values	3	1	1	1	3	1	3	3	3	3	3	3	3	3	3	3	3
Minimum	44.5	29	0.3	656	0.04	3.75	55.8	0.025	0.025	37.5	0.0015	0.0015	12.2	0.0035	5200	0.25	0.044
Maximum	51.9	29	0.3	656	0.7	3.75	123	0.13	0.025	83.2	0.01	0.0035	15.2	0.017	7770	0.8	0.07
% of values undetected					100%	100%		33%	100%		100%	100%		67%		67%	
# of values between MDL and MRL		1	1										1	1		1	

Appendix 35.1D. Vegetation Sample Results, Cook Inlet Drainages Study Area, 2004-2007

	Copper	Iron	Lead	Magnesium	Manganese	Mercury	Molybdenum	Nickel	Potassium	Selenium	Silver	Sodium	Thallium	Tin	Vanadium	Zinc
Species - Location ID	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Vaccinium vitis-idaea-TE22																
Sample Date																
08/29/04	2.95	44.5	0.21	1060	1770	0.04	**0.025**	3.53	3840	**0.05**	**0.0015**	56.4	**0.002**	**2.5**	**0.19**	15.7
08/28/06	2.29	27	0.05	1170	1030	0.02	**0.04**	1.75	4490	**0.05**	**0.003**	22.8	**0.01**	**3.5**	**0.04**	14.5
09/13/07	2.21	27	0.1	1190	779	0.025	0.11	0.95	4900	**0.1**	**0.004**	49	**0.004**	**2.45**	**0.13**	14.6
Mean	2.48	33	0.12	1140	1190	0.028	0.06	2.08	4410	0.07	0.0028	42.7	0.005	2.8	0.12	14.9
Median	2.29	27	0.1	1170	1030	0.025	0.04	1.75	4490	0.05	0.003	49	0.004	2.5	0.13	14.6
St. Deviation	0.41	10	0.08	70	520	0.01	0.05	1.32	530	0.03	0.0013	17.7	0.004	0.6	0.08	0.7
# of values	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Minimum	2.21	27	0.05	1060	779	0.02	0.025	0.95	3840	0.05	0.0015	22.8	0.002	2.45	0.04	14.5
Maximum	2.95	44.5	0.21	1190	1770	0.04	0.11	3.53	4900	0.1	0.004	56.4	0.01	3.5	0.19	15.7
% of values undetected							33%			100%	100%		33%	67%		
# of values between MDL and MRL							1						2	1	3	

Key: **Bold Results** = Parameter undetected by test, value shown is 1/2 MDL or 1/2 MRL.
If result was not detected at the lab MDL, the value shown is 1/2 MDL.
If result was validation flagged U or UJ, the value shown is 1/2 MRL.
Green Results = Estimated result reported by laboratory below method reporting limit.
MDL = Method Detection Limit.
MRL = Method Reporting Limit.
NA = Not Applicable.
Note: All results reported on dry weight basis, except total solids reported on wet weight basis.

APPENDIX 35.1E

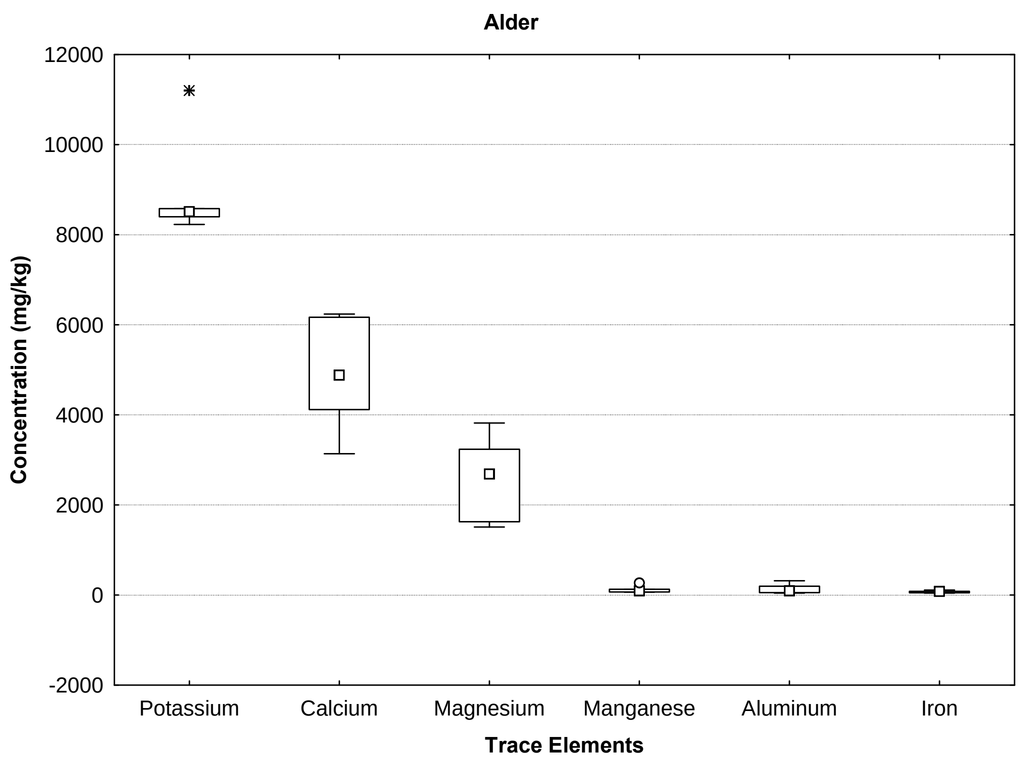
Box-and-Whisker Plots for Vegetation Data, Cook Inlet Drainages Study Area

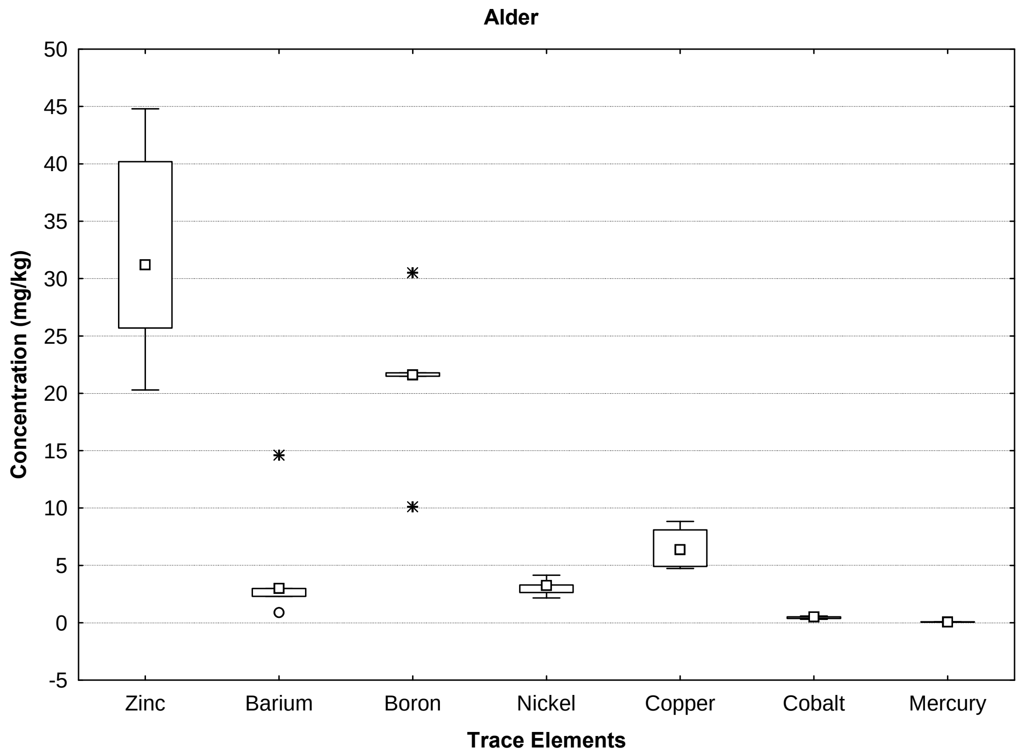
Box-and-Whisker Plots for Vegetative Tissue Data

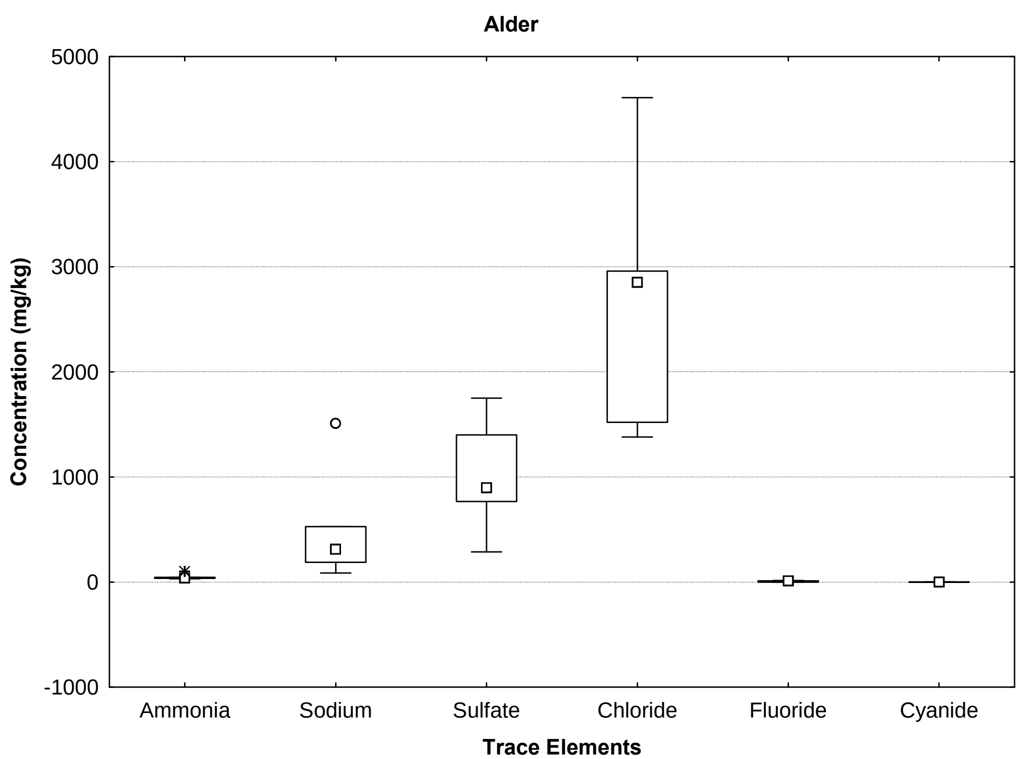
Boxplot Legend: This legend applies to all soil boxplots for the Cook Inlet drainages study area.

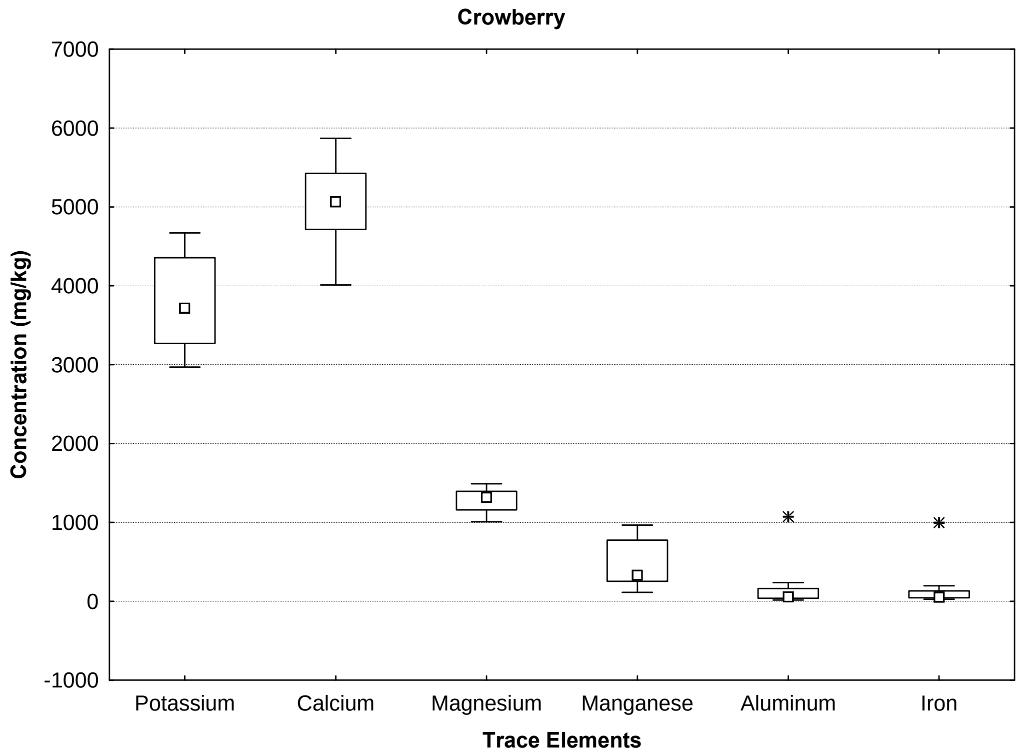
Median 25%-75% Non-outlier Range Outliers Extremes

Trace Element Vegetative Tissue Concentrations by Plant Species

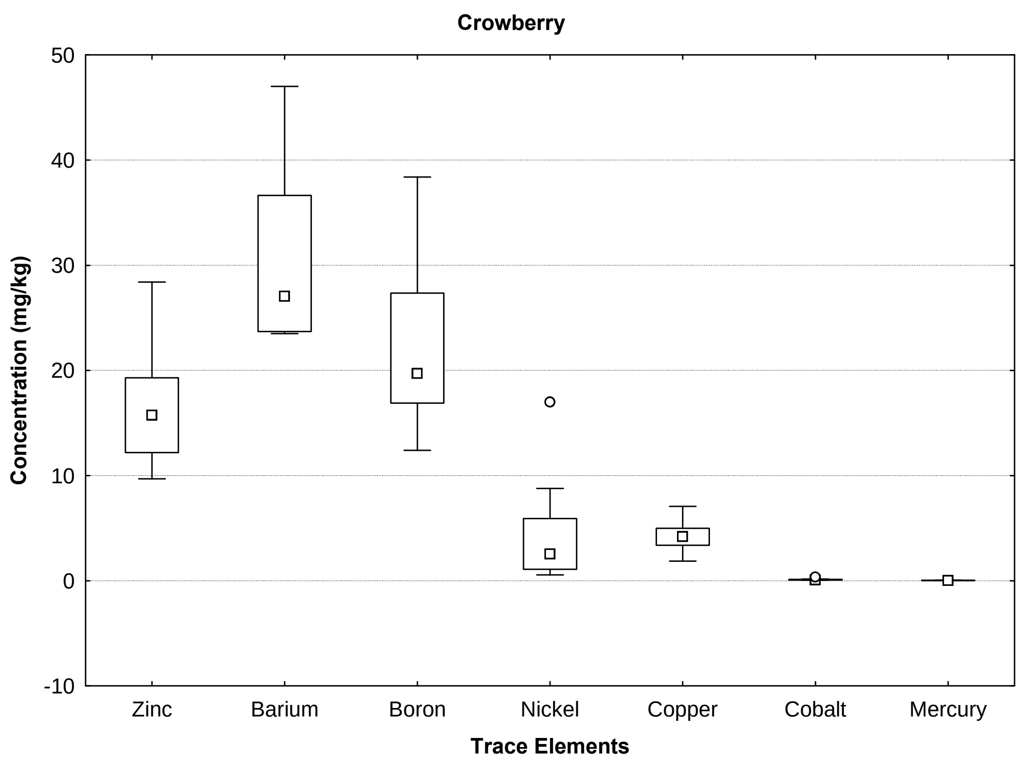



Alder
50
45
40
35
30
25
20
15
10
5
0
-5
Concentration (mg/kg)
Zinc
Barium
Boron
Nickel
Copper
Cobalt
Mercury
Trace Elements

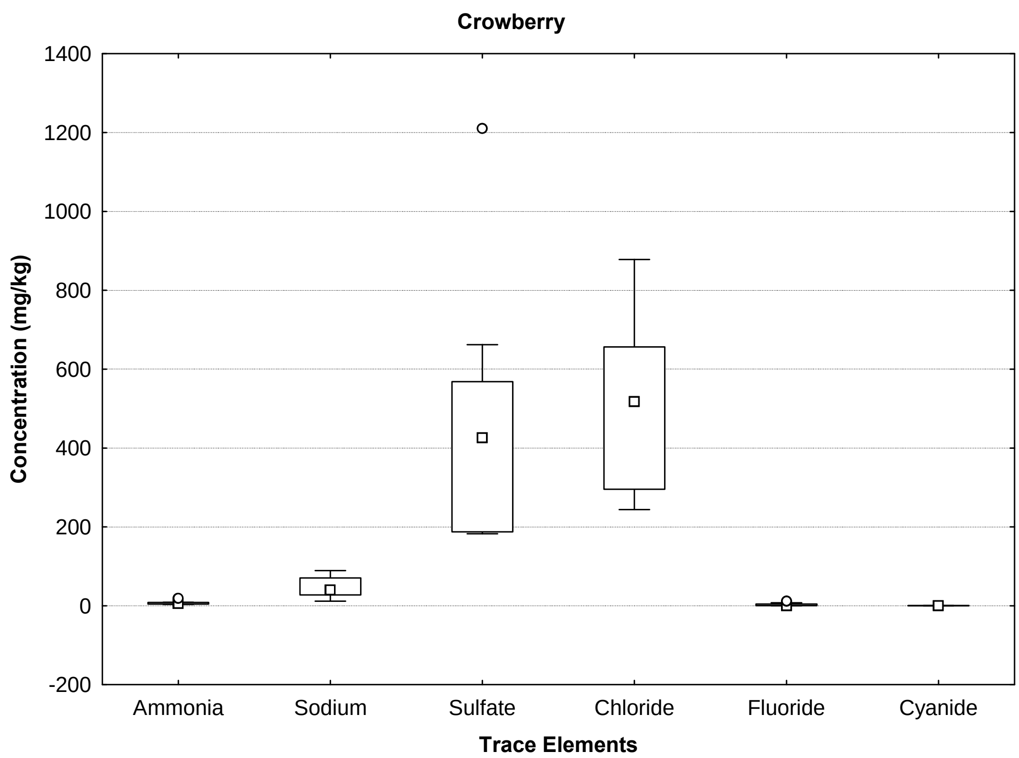

Alder
5000
4000
3000
2000
1000
0
-1000
Concentration (mg/kg)
Ammonia
Sodium
Sulfate
Chloride
Fluoride
Cyanide
Trace Elements

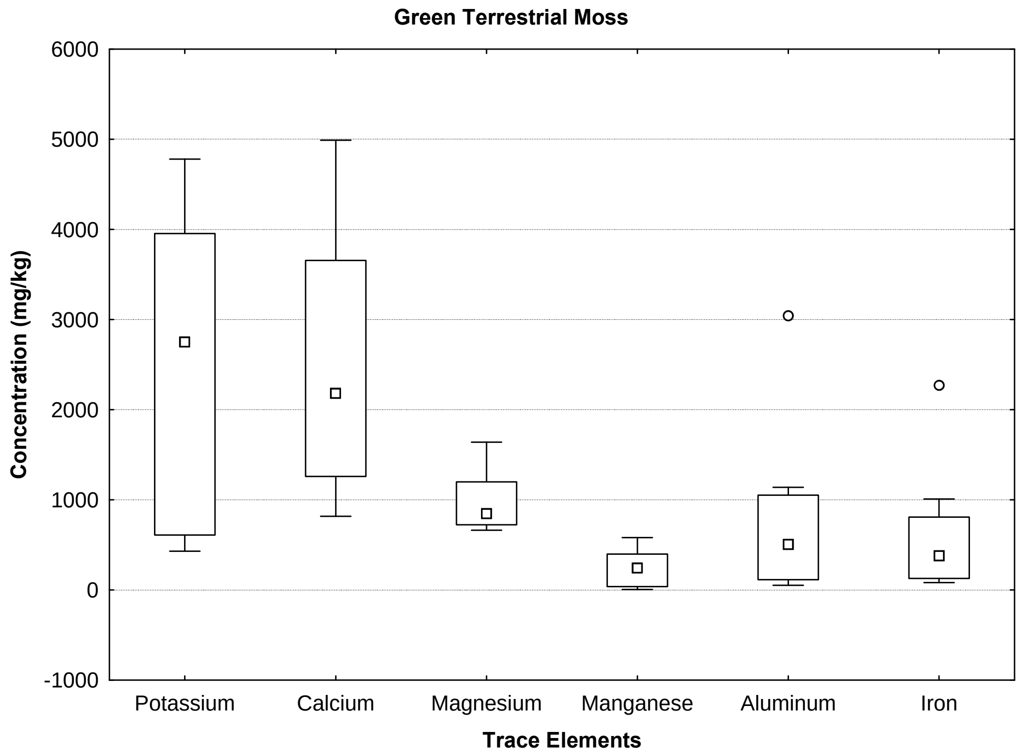


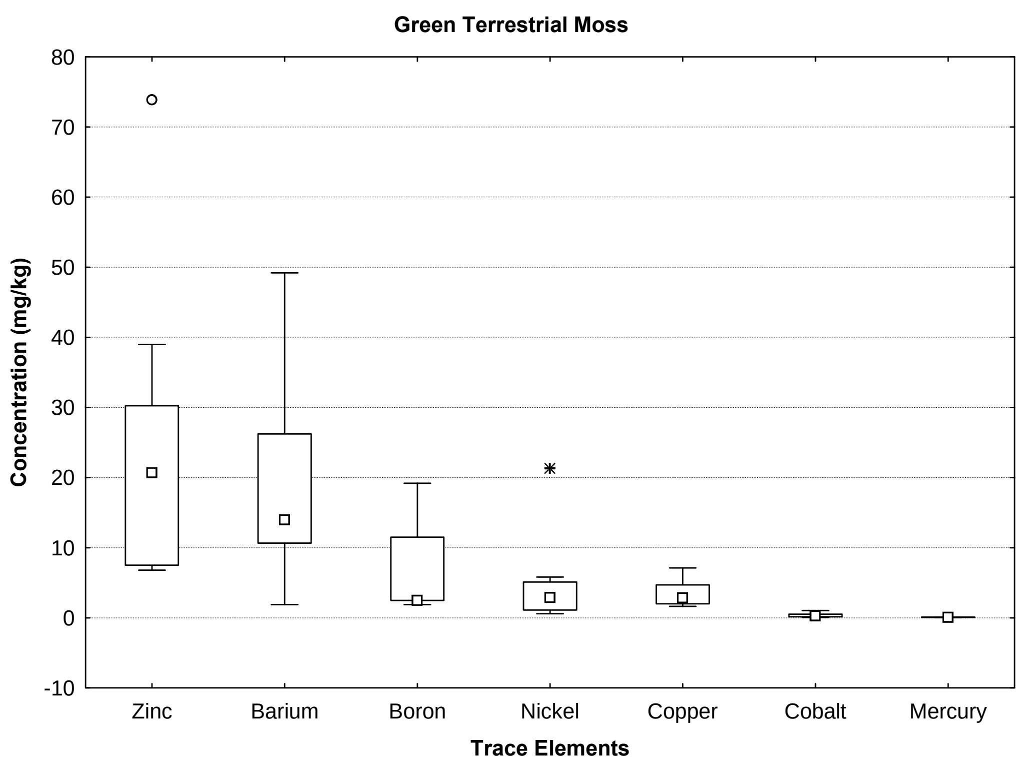
Crowberry
Concentration (mg/kg)
7000
6000
5000
4000
3000
2000
1000
0
-1000
Potassium
Calcium
Magnesium
Manganese
Aluminum
Iron
Trace Elements

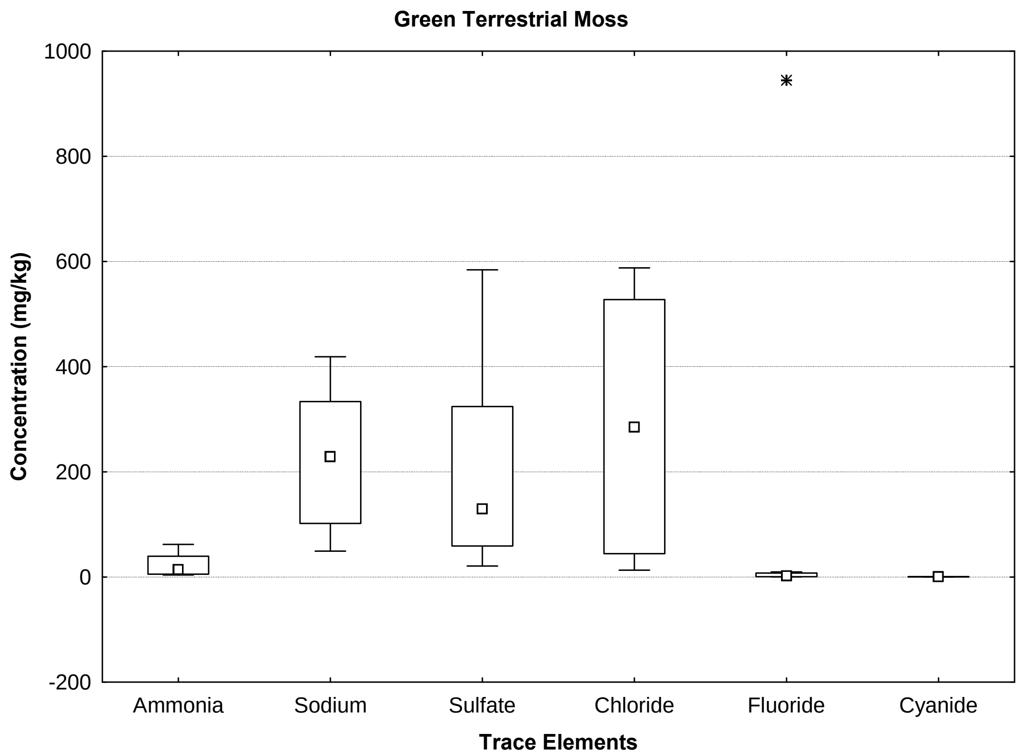


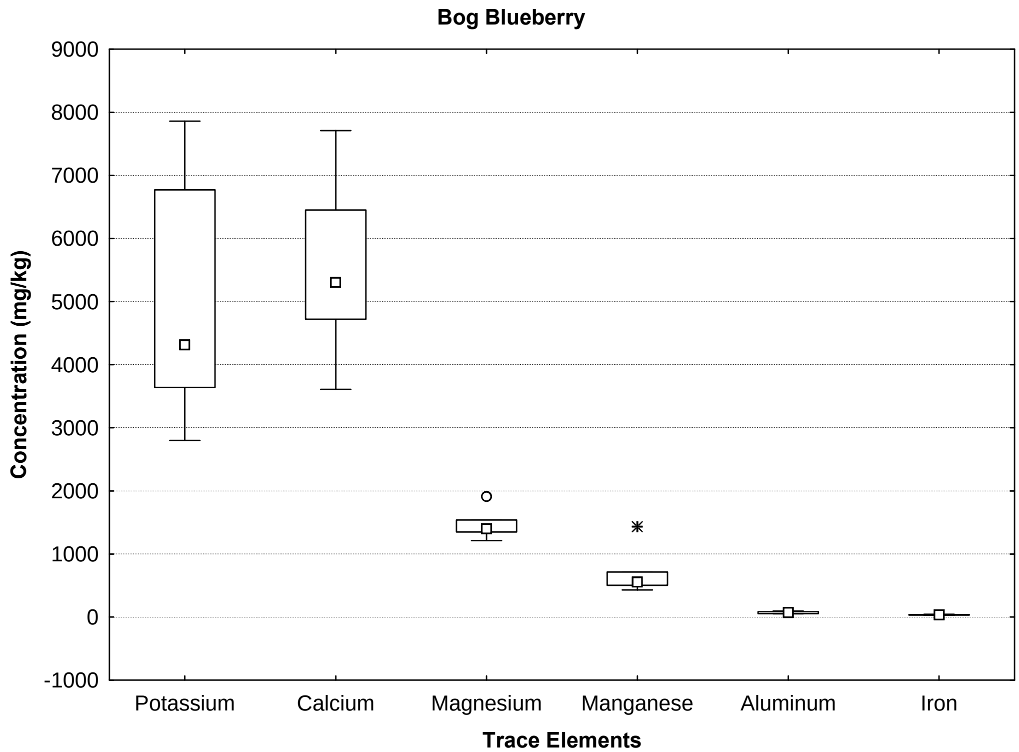
Crowberry
Concentration (mg/kg)
50
40
30
20
10
0
-10
Zinc
Barium
Boron
Nickel
Copper
Cobalt
Mercury
Trace Elements

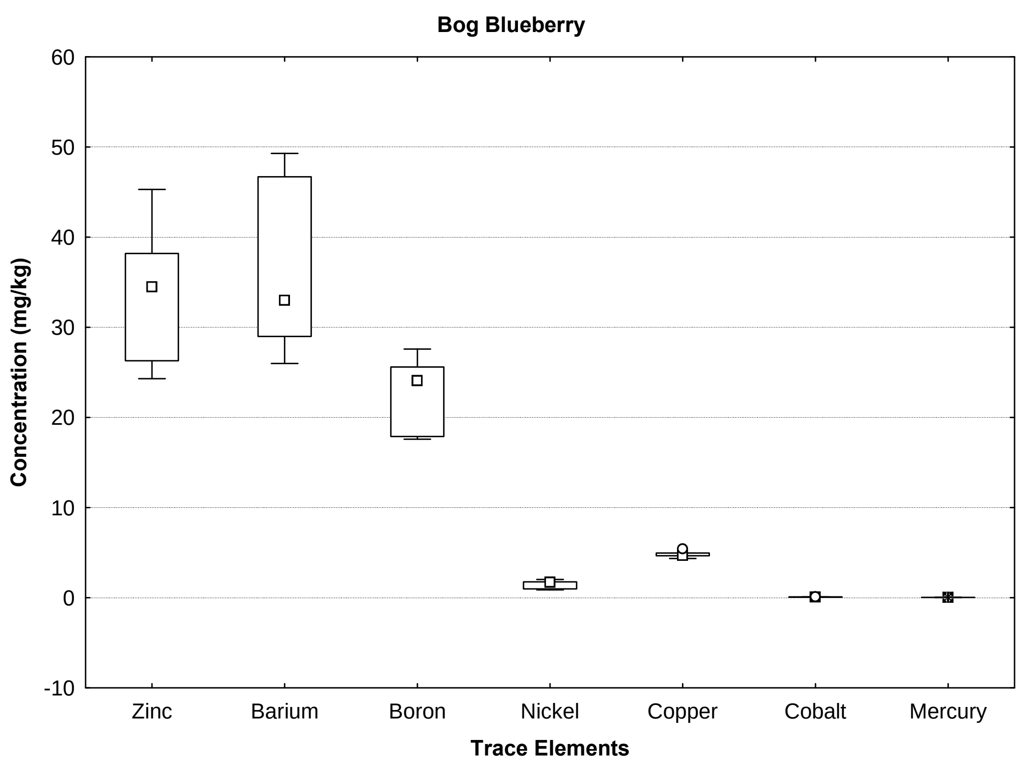

Crowberry
Concentration (mg/kg)
1400
1200
1000
800
600
400
200
0
-200
Ammonia
Sodium
Sulfate
Chloride
Fluoride
Cyanide
Trace Elements

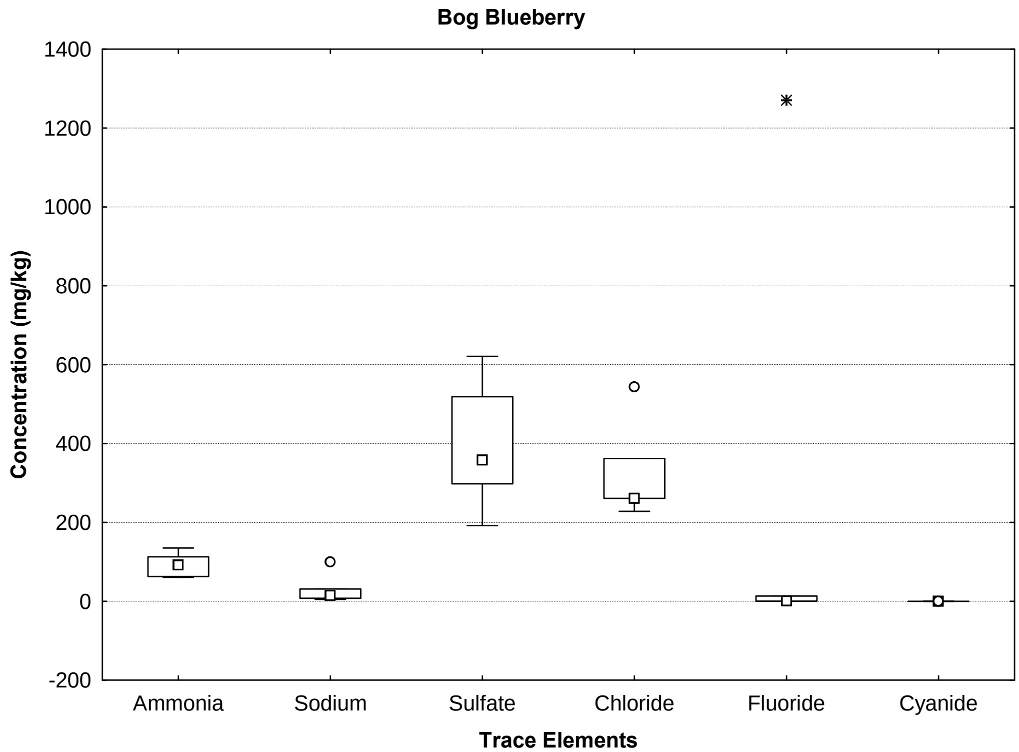

Green Terrestrial Moss
6000
5000
4000
3000
2000
1000
0
-1000
Concentration (mg/kg)
Potassium
Calcium
Magnesium
Manganese
Aluminum
Iron
Trace Elements


Green Terrestrial Moss
80
70
60
50
40
30
20
10
0
-10
Concentration (mg/kg)
Zinc
Barium
Boron
Nickel
Copper
Cobalt
Mercury
Trace Elements

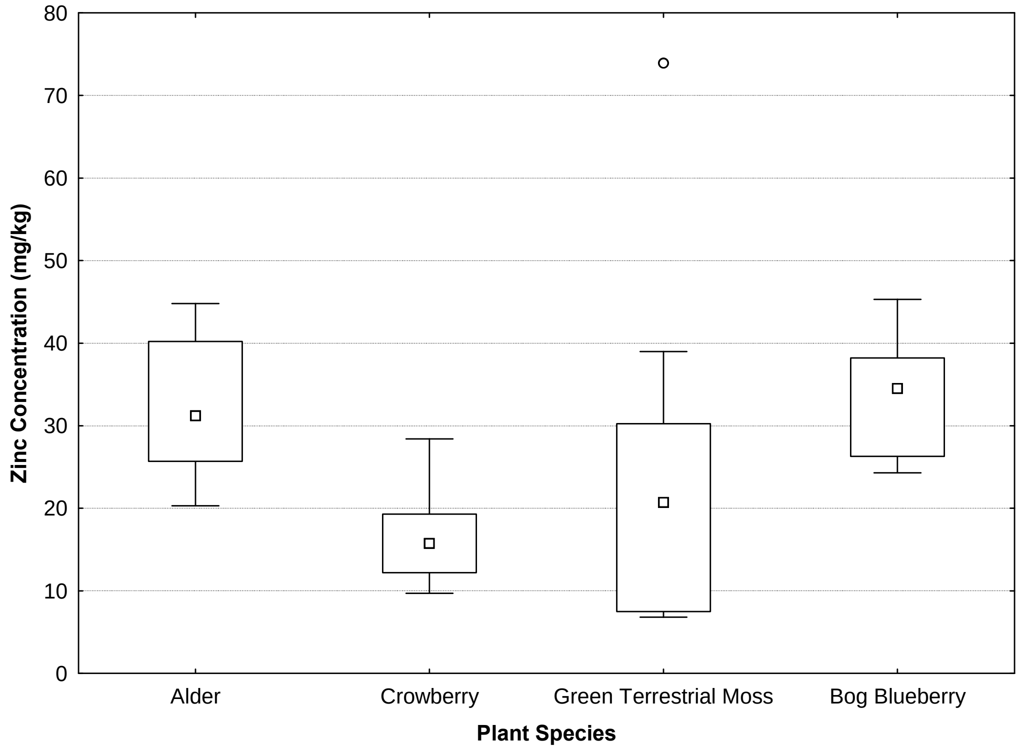

Green Terrestrial Moss
1000
800
600
400
200
0
-200
Concentration (mg/kg)
Ammonia
Sodium
Sulfate
Chloride
Fluoride
Cyanide
Trace Elements

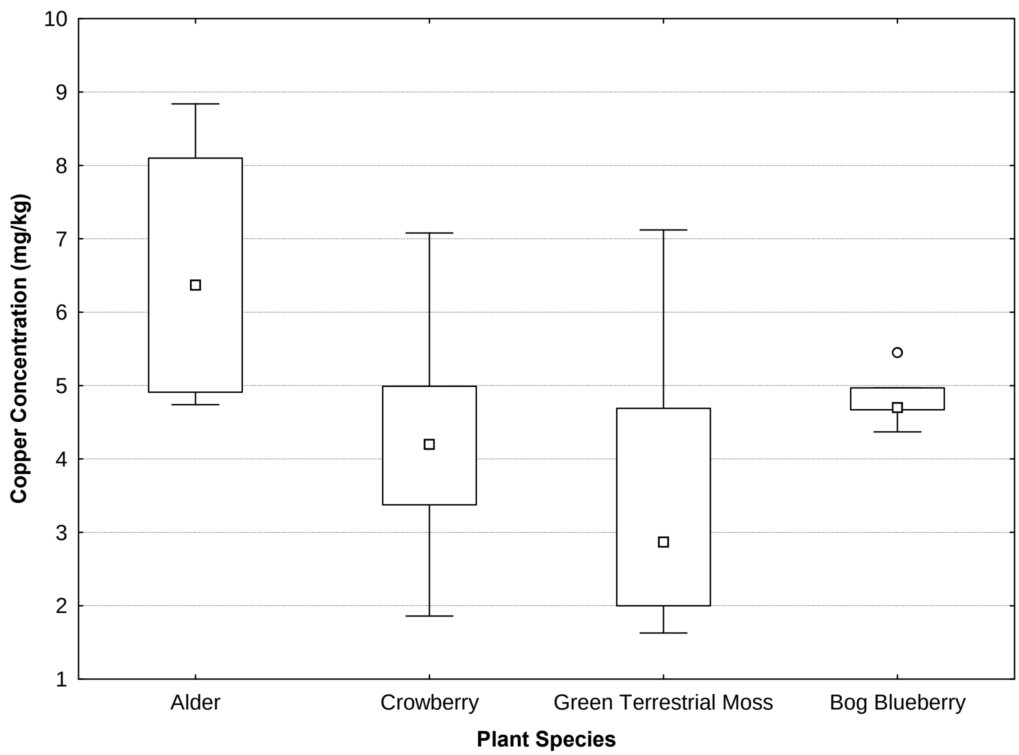

Bog Blueberry
Concentration (mg/kg)
9000
8000
7000
6000
5000
4000
3000
2000
1000
0
-1000
Potassium
Calcium
Magnesium
Manganese
Aluminum
Iron
Trace Elements

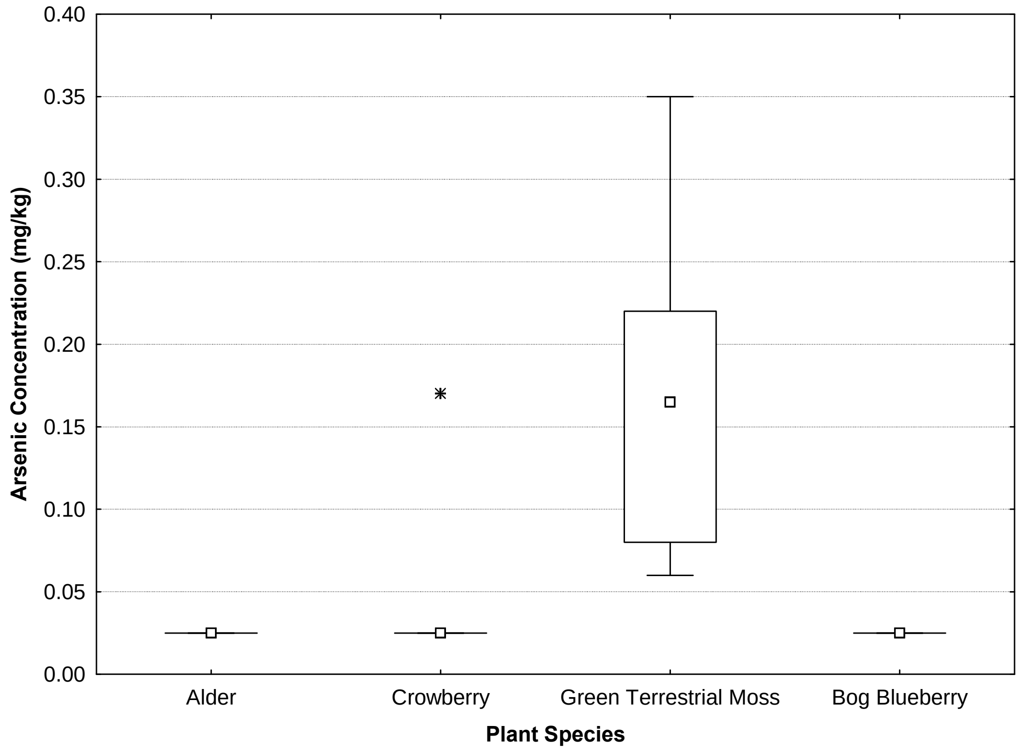

Bog Blueberry
Concentration (mg/kg)
60
50
40
30
20
10
0
-10
Zinc
Barium
Boron
Nickel
Copper
Cobalt
Mercury
Trace Elements


Bog Blueberry
1400
1200
1000
800
600
400
200
0
-200
Concentration (mg/kg)
Ammonia
Sodium
Sulfate
Chloride
Fluoride
Cyanide
Trace Elements

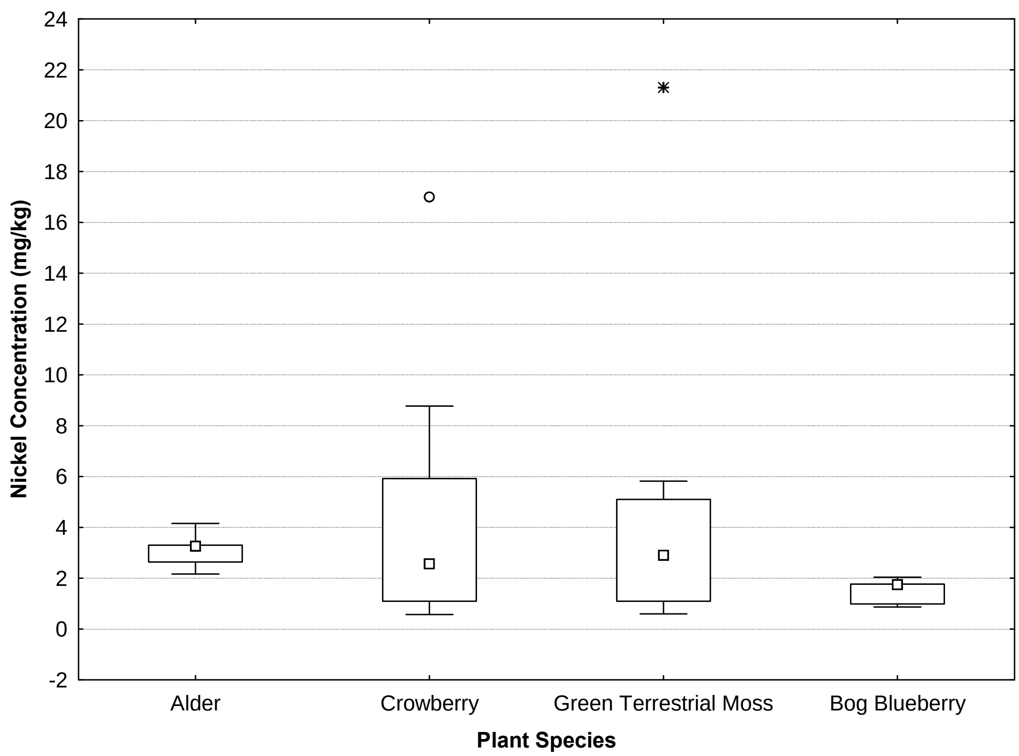
Trace Element Vegetative Tissue Concentrations in Plant Species by Element



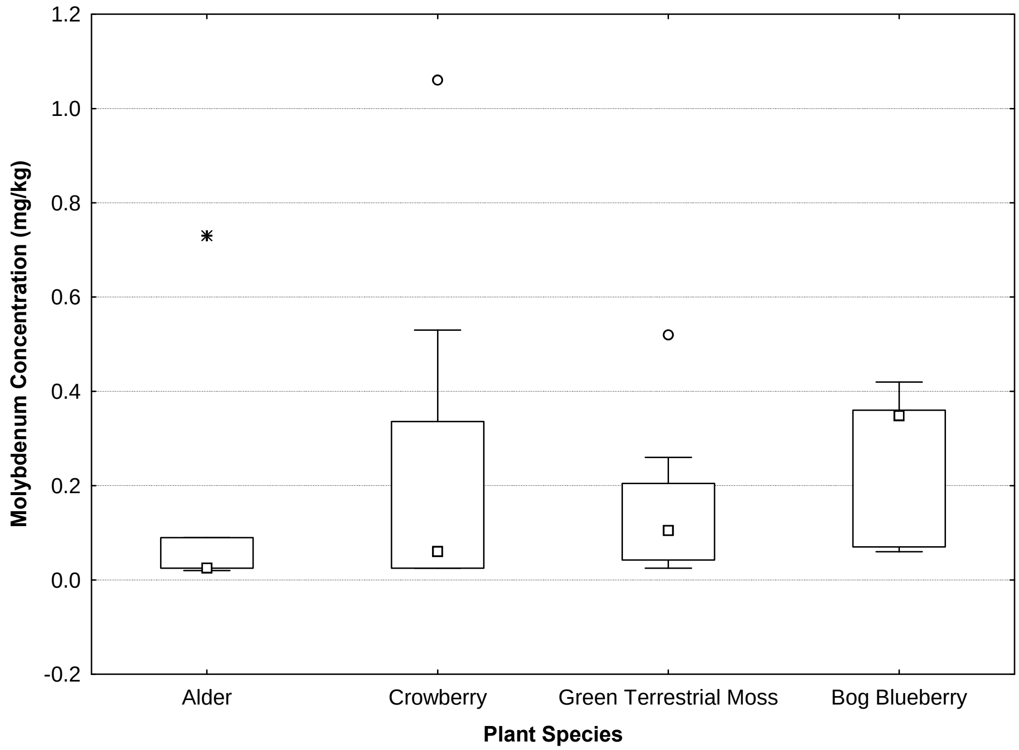


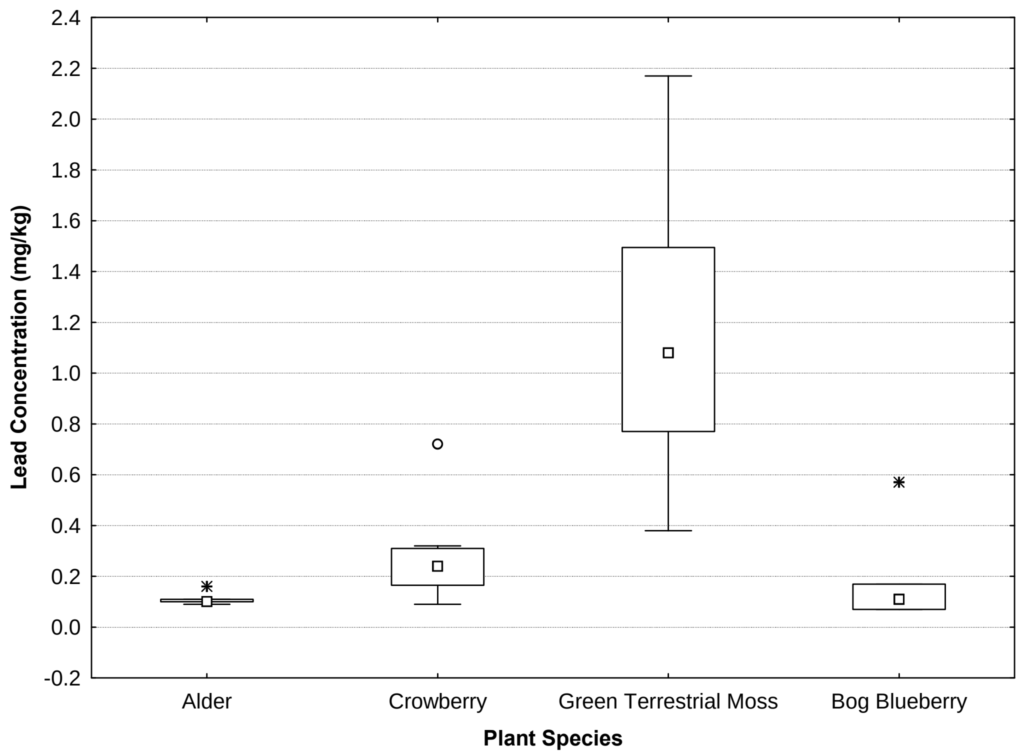


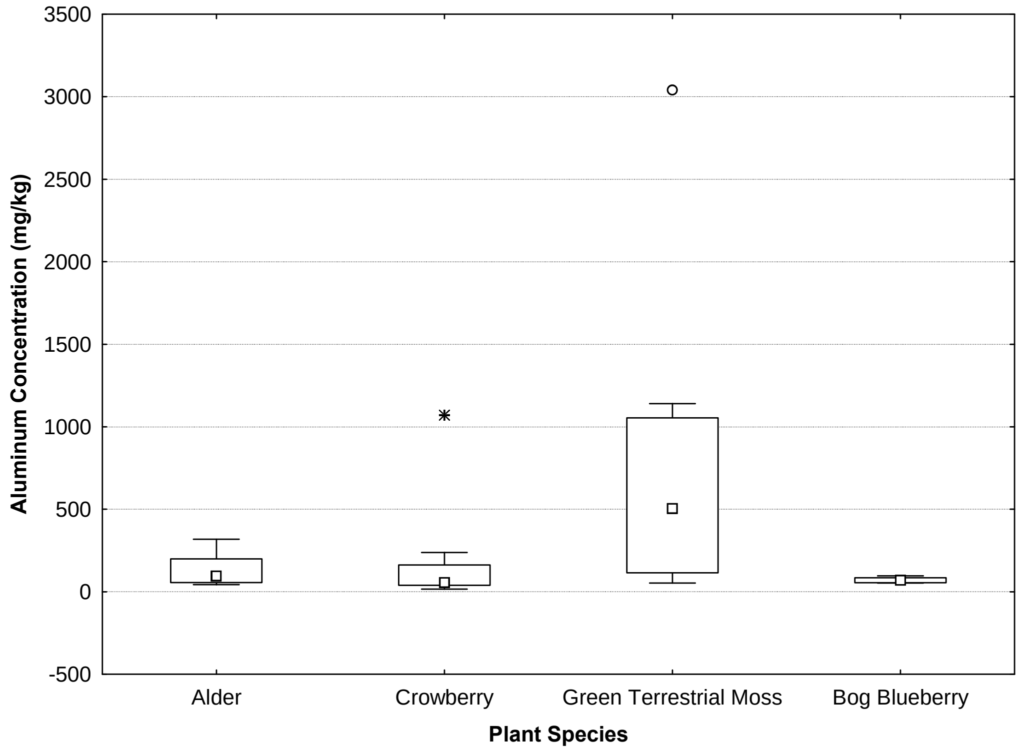
Arsenic Concentration (mg/kg)
0.40
0.35
0.30
0.25
0.20
0.15
0.10
0.05
0.00
Alder
Crowberry
Green Terrestrial Moss
Bog Blueberry
Plant Species

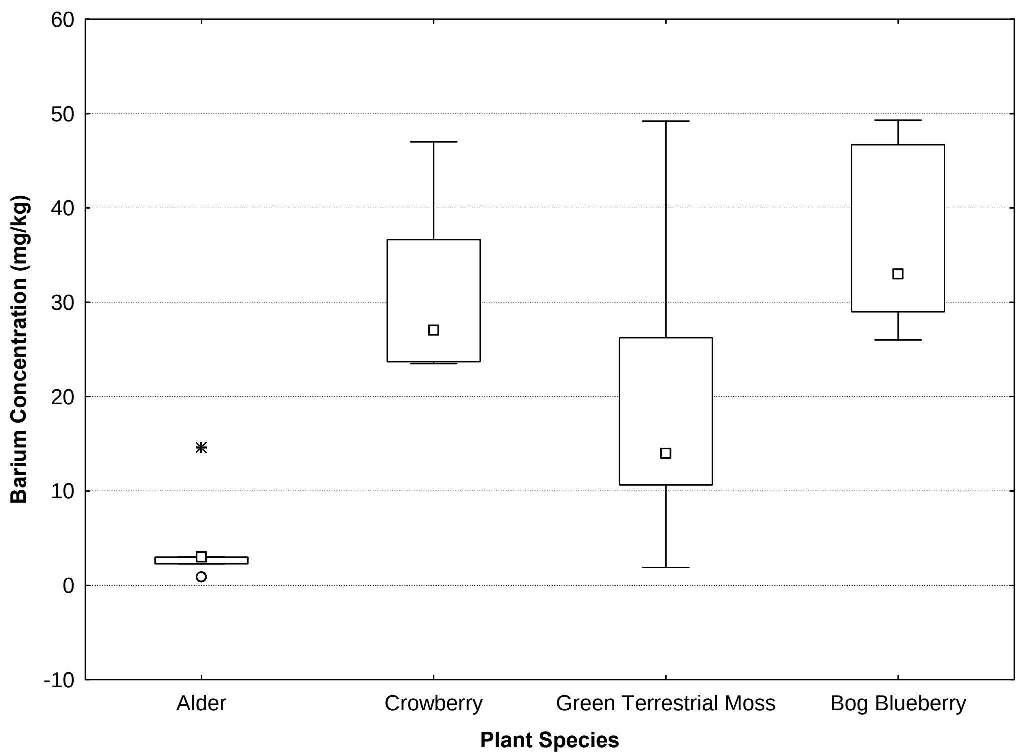


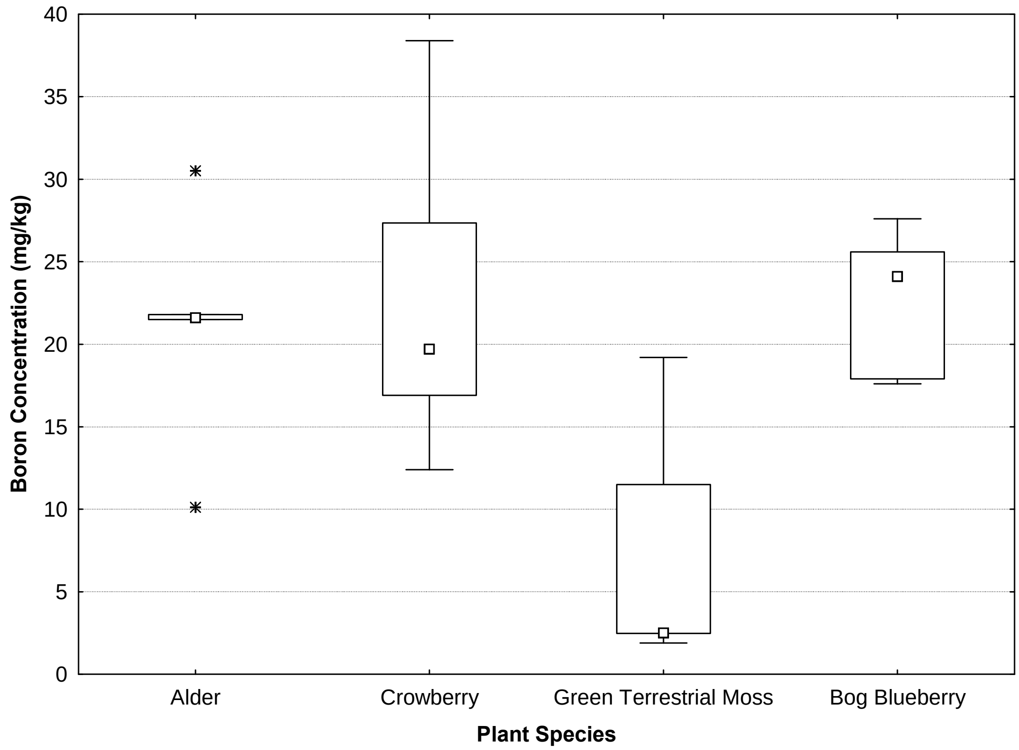
Nickel Concentration (mg/kg)
24
22
20
18
16
14
12
10
8
6
4
2
0
-2
Alder
Crowberry
Green Terrestrial Moss
Bog Blueberry
Plant Species

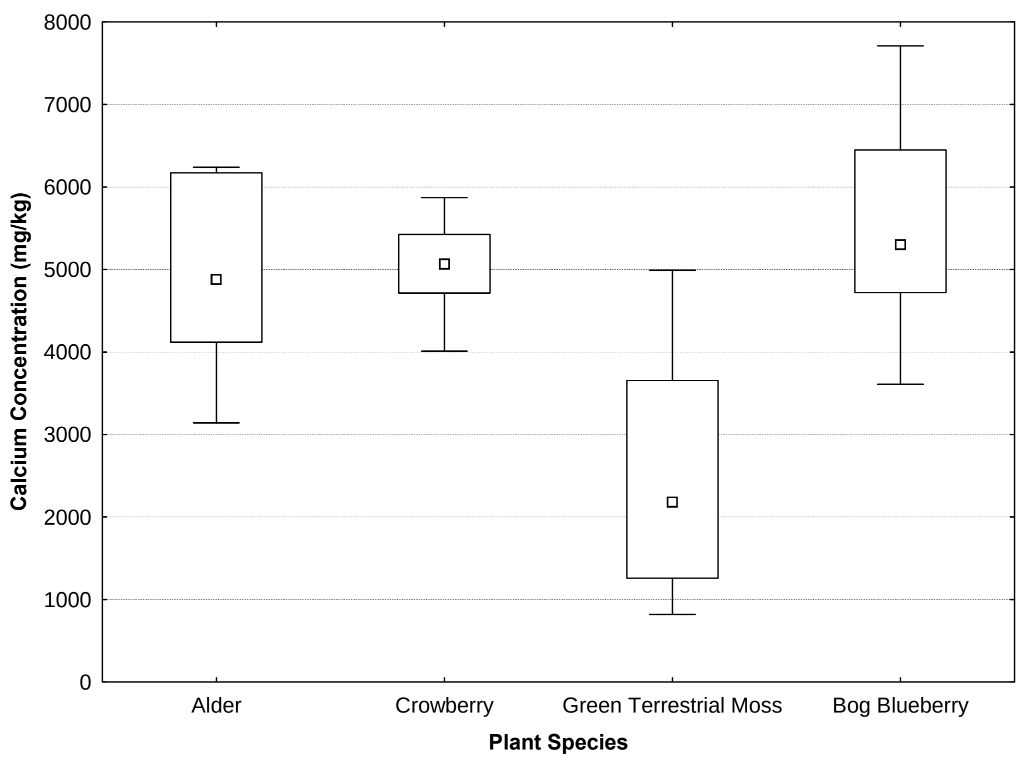

Molybdenum Concentration (mg/kg)
1.2
1.0
0.8
0.6
0.4
0.2
0.0
-0.2
Alder
Crowberry
Green Terrestrial Moss
Bog Blueberry
Plant Species

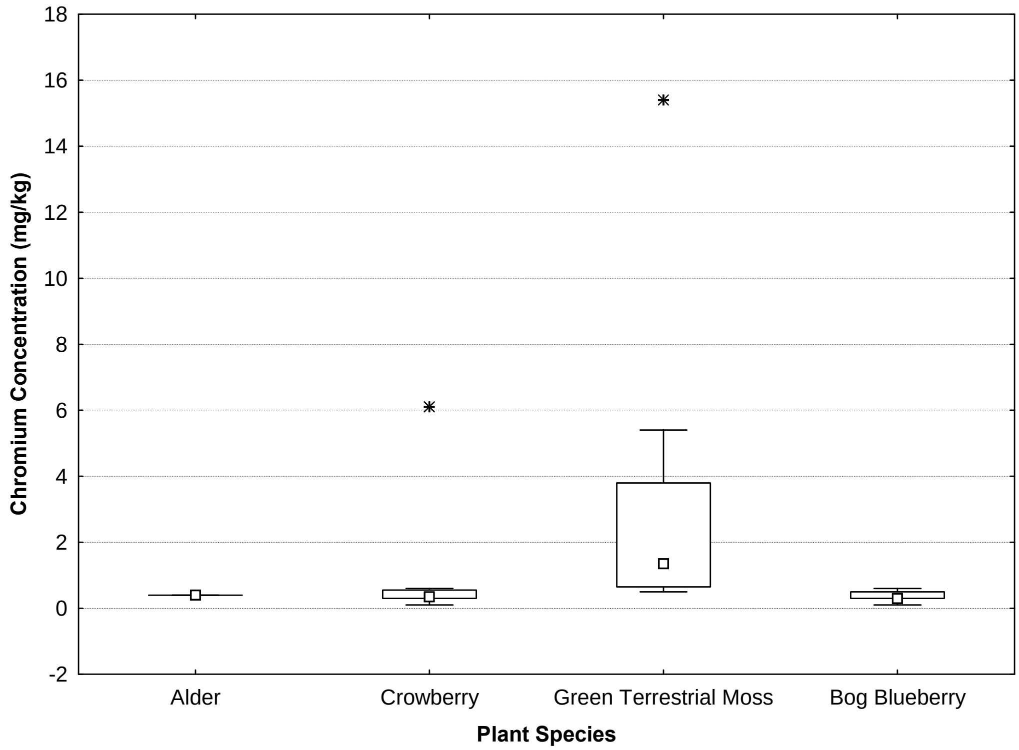

Lead Concentration (mg/kg)
2.4
2.2
2.0
1.8
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
-0.2
Alder
Crowberry
Green Terrestrial Moss
Bog Blueberry
Plant Species


3500
3000
2500
2000
1500
1000
500
0
-500
Aluminum Concentration (mg/kg)
Alder
Crowberry
Green Terrestrial Moss
Bog Blueberry
Plant Species

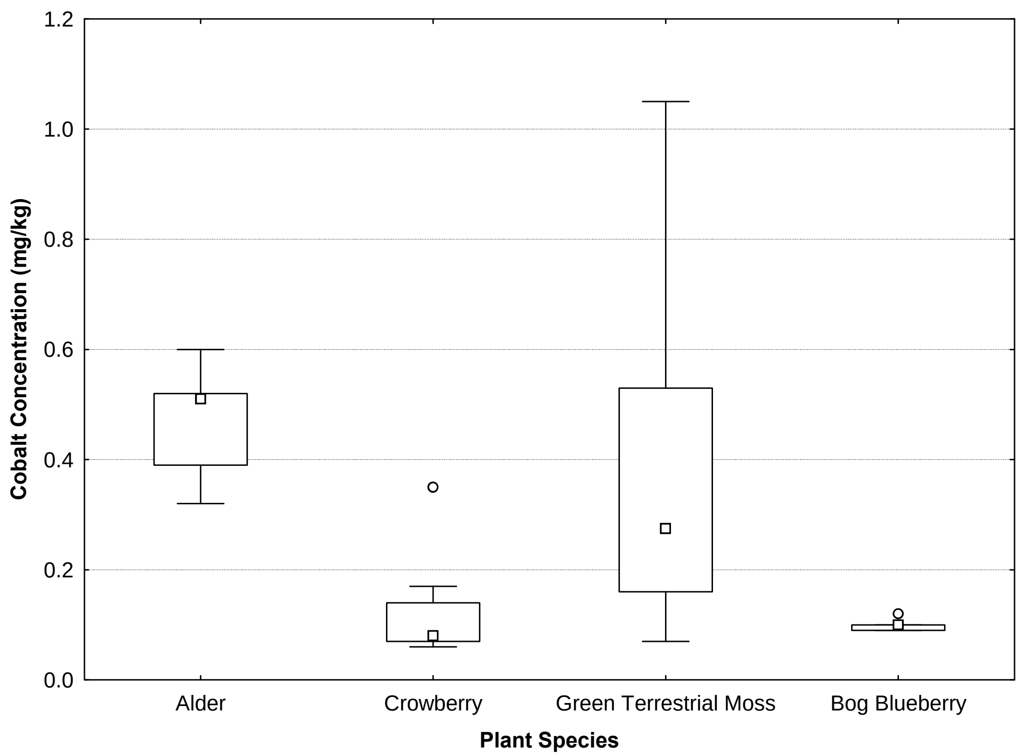

60
50
40
30
20
10
0
-10
Barium Concentration (mg/kg)
Alder
Crowberry
Green Terrestrial Moss
Bog Blueberry
Plant Species


Boron Concentration (mg/kg)
0
5
10
15
20
25
30
35
40
Alder
Crowberry
Green Terrestrial Moss
Bog Blueberry
Plant Species

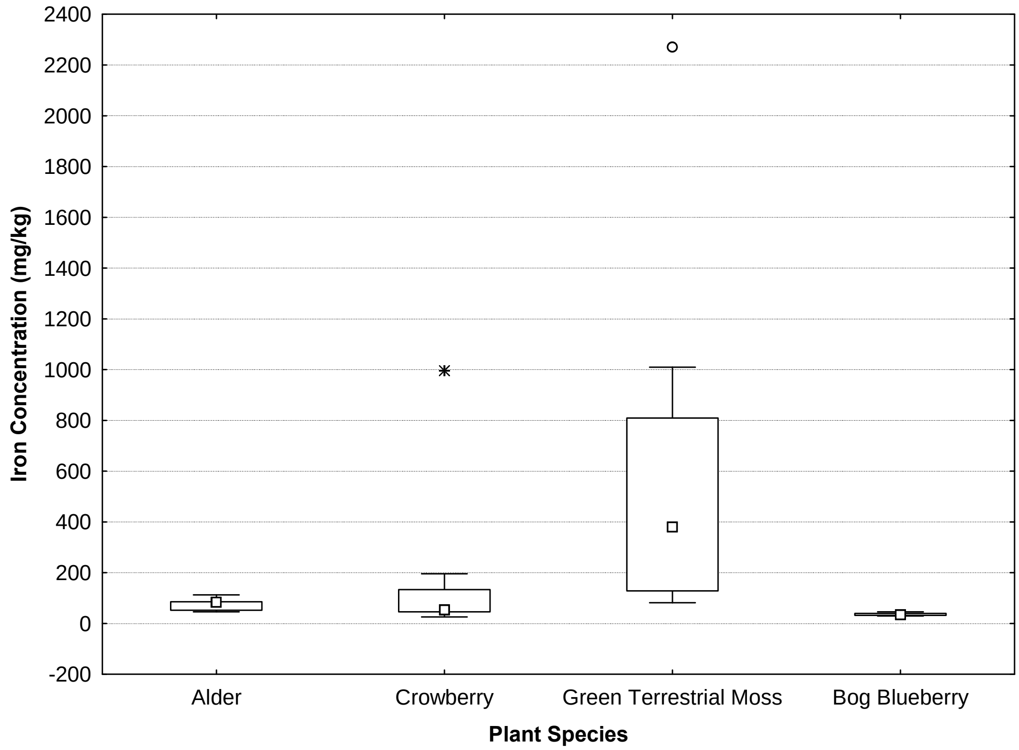

Calcium Concentration (mg/kg)
0
1000
2000
3000
4000
5000
6000
7000
8000
Alder
Crowberry
Green Terrestrial Moss
Bog Blueberry
Plant Species

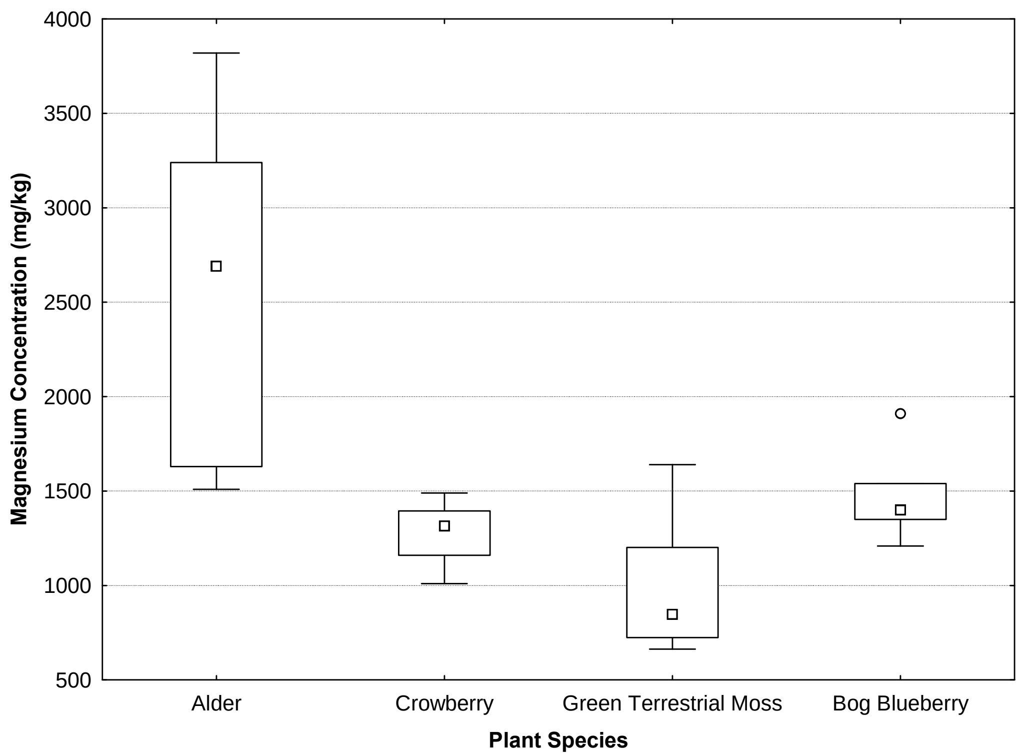


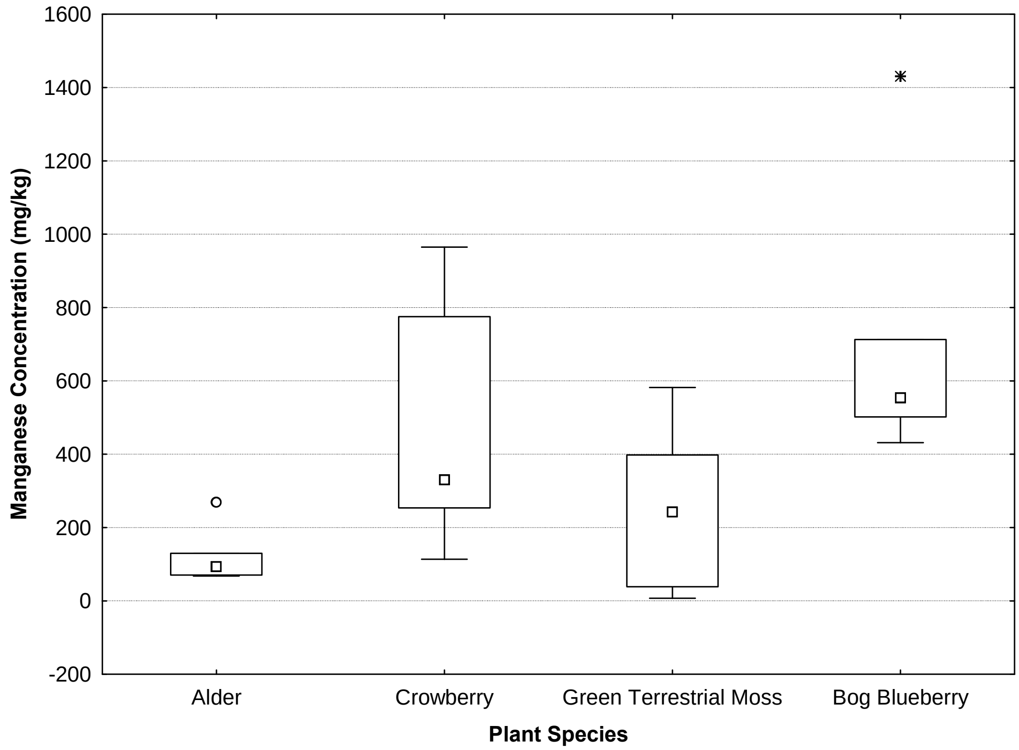
Chromium Concentration (mg/kg)
18
16
14
12
10
8
6
4
2
0
-2
Alder
Crowberry
Green Terrestrial Moss
Bog Blueberry
Plant Species

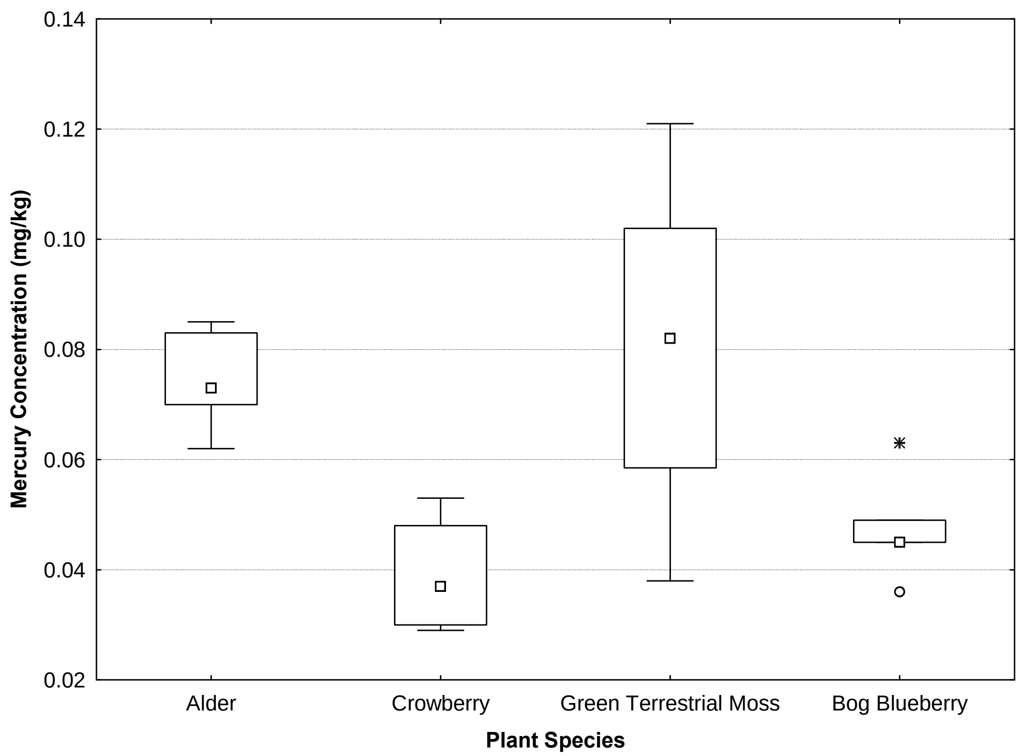


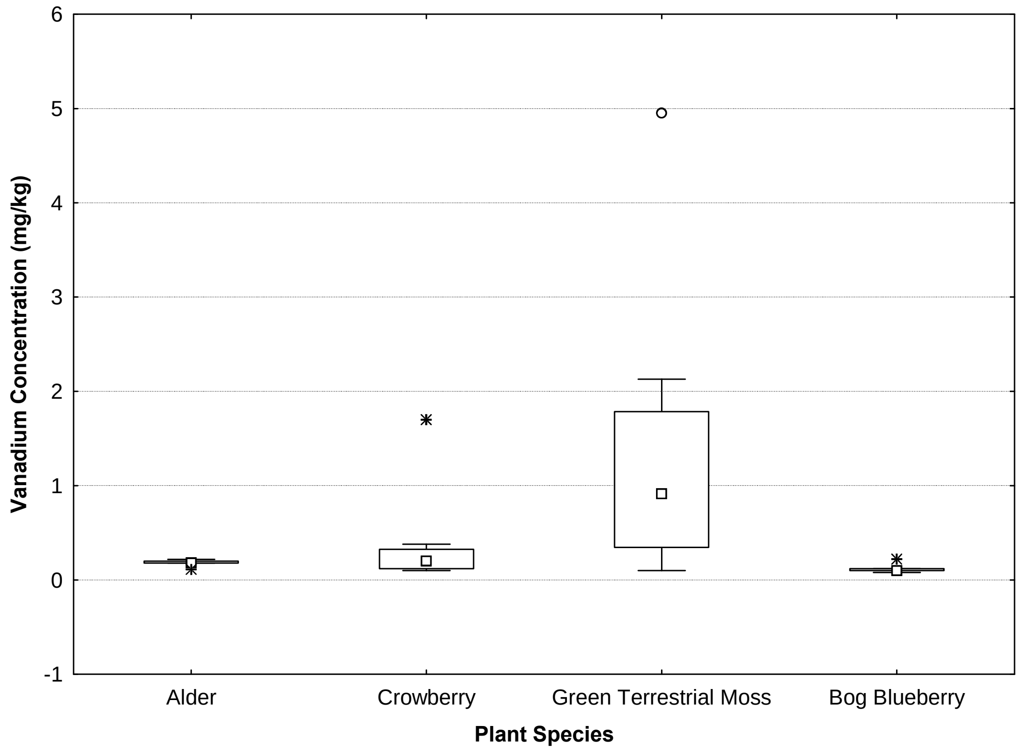
Cobalt Concentration (mg/kg)
1.2
1.0
0.8
0.6
0.4
0.2
0.0
Alder
Crowberry
Green Terrestrial Moss
Bog Blueberry
Plant Species

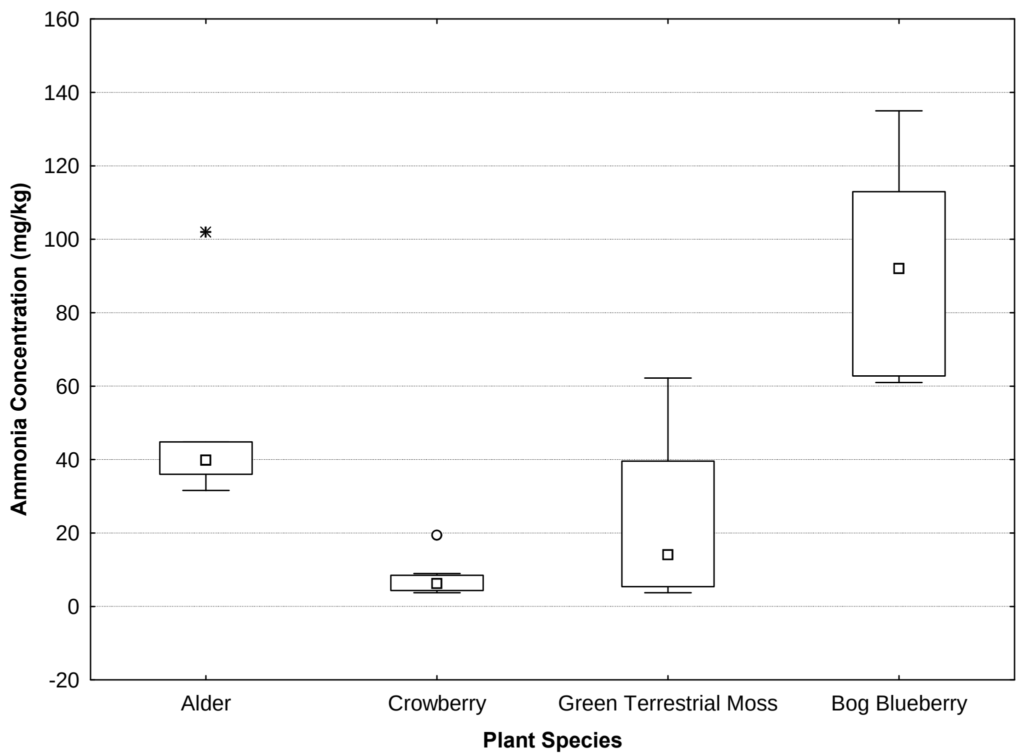

2400
2200
2000
1800
1600
1400
1200
1000
800
600
400
200
0
-200
Iron Concentration (mg/kg)
Alder
Crowberry
Green Terrestrial Moss
Bog Blueberry
Plant Species

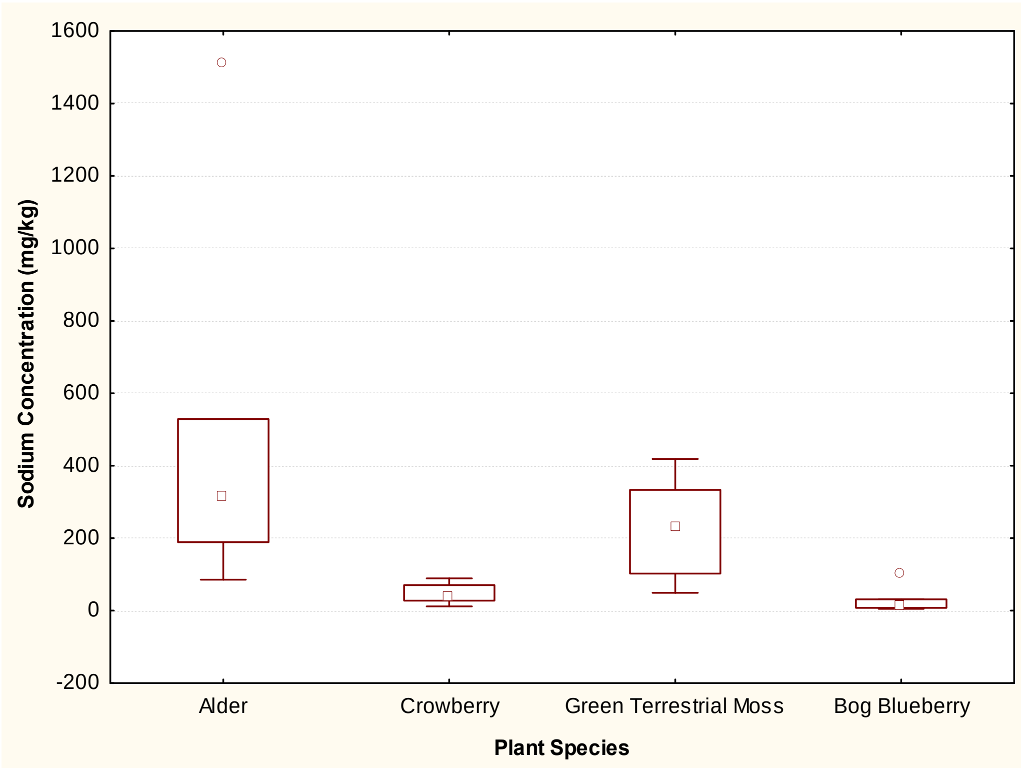

4000
3500
3000
2500
2000
1500
1000
500
Magnesium Concentration (mg/kg)
Alder
Crowberry
Green Terrestrial Moss
Bog Blueberry
Plant Species


1600
1400
1200
1000
800
600
400
200
0
-200
Manganese Concentration (mg/kg)
Alder
Crowberry
Green Terrestrial Moss
Bog Blueberry
Plant Species

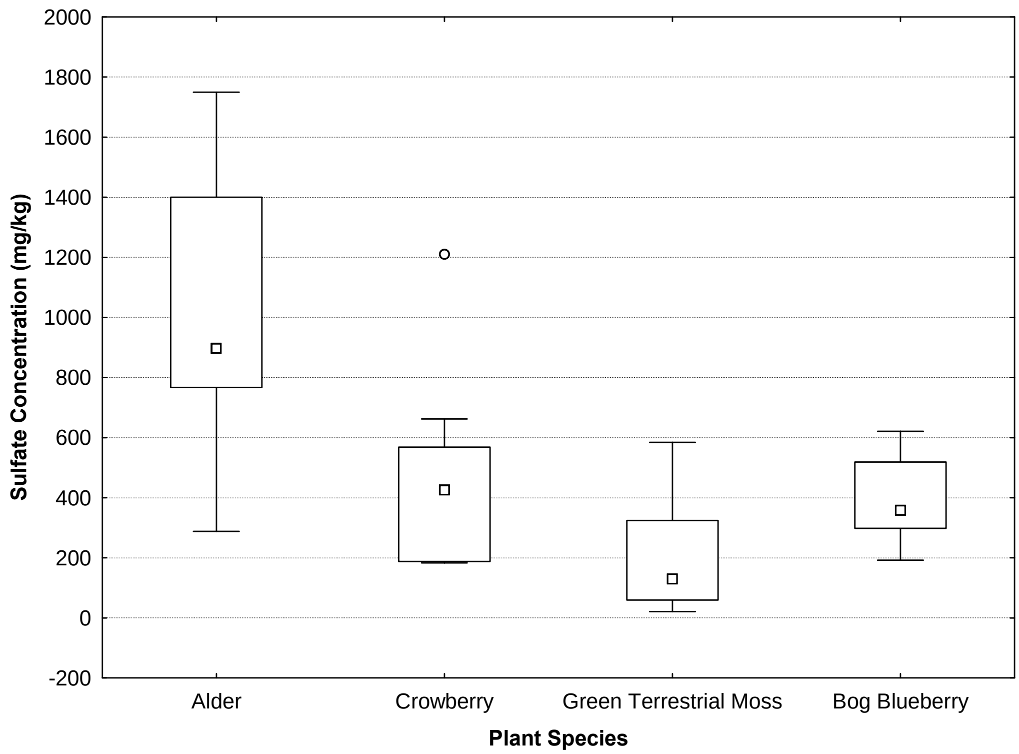

0.14
0.12
0.10
0.08
0.06
0.04
0.02
Mercury Concentration (mg/kg)
Alder
Crowberry
Green Terrestrial Moss
Bog Blueberry
Plant Species


6
5
4
3
2
1
0
-1
Vanadium Concentration (mg/kg)
Alder
Crowberry
Green Terrestrial Moss
Bog Blueberry
Plant Species

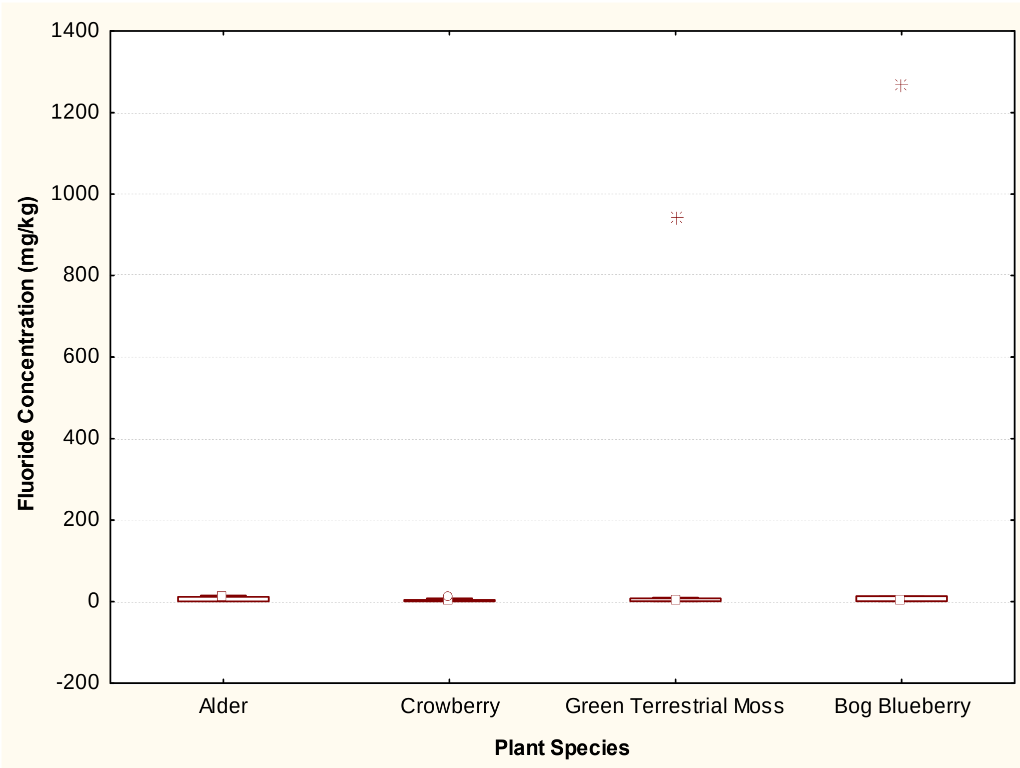

160
140
120
100
80
60
40
20
0
-20
Ammonia Concentration (mg/kg)
Alder
Crowberry
Green Terrestrial Moss
Bog Blueberry
Plant Species

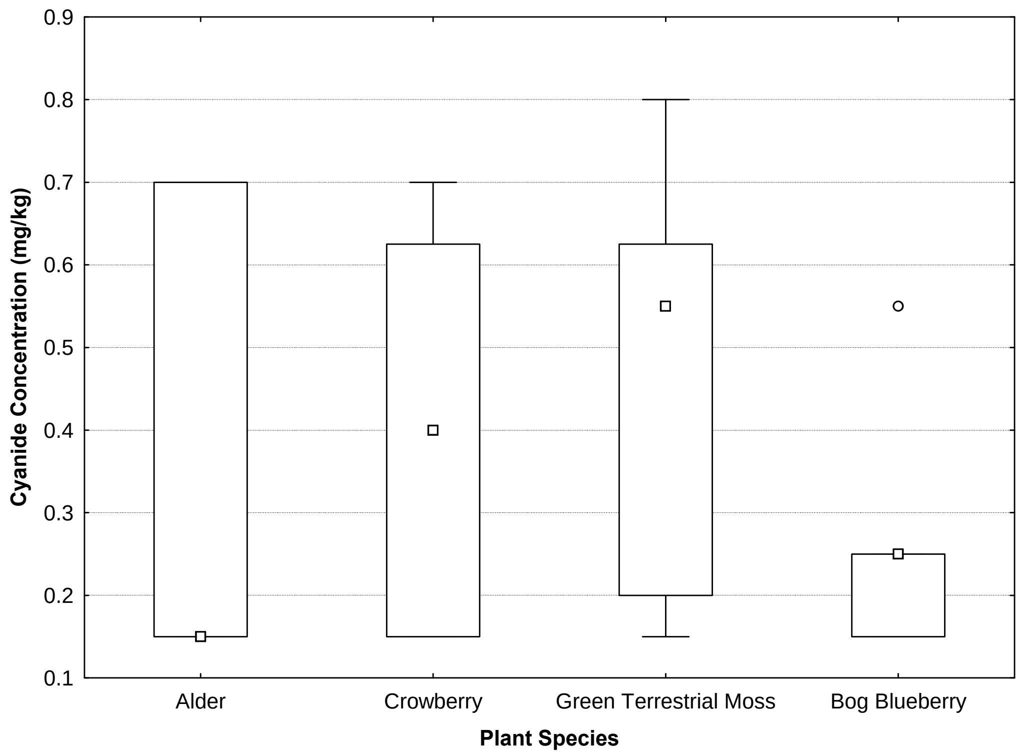


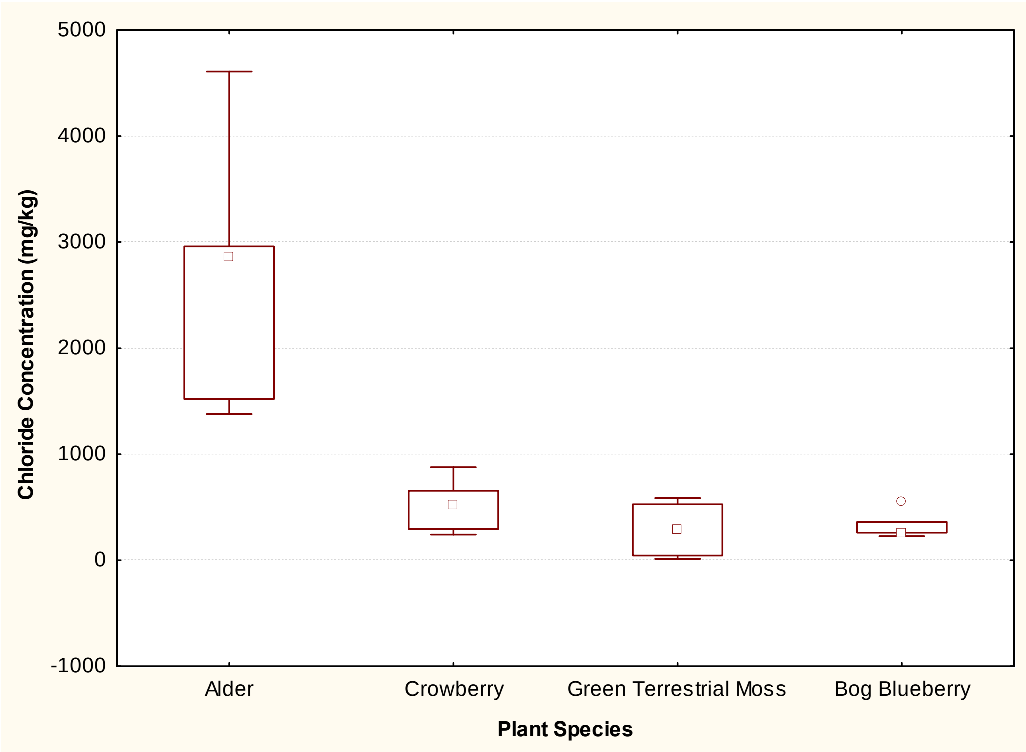
Sodium Concentration (mg/kg)
1600
1400
1200
1000
800
600
400
200
0
-200
Alder
Crowberry
Green Terrestrial Moss
Bog Blueberry
Plant Species



Sulfate Concentration (mg/kg)
2000
1800
1600
1400
1200
1000
800
600
400
200
0
-200
Alder
Crowberry
Green Terrestrial Moss
Bog Blueberry
Plant Species


Fluoride Concentration (mg/kg)
1400
1200
1000
800
600
400
200
0
-200
Alder
Crowberry
Green Terrestrial Moss
Bog Blueberry
Plant Species


Cyanide Concentration (mg/kg)
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
Alder
Crowberry
Green Terrestrial Moss
Bog Blueberry
Plant Species


5000
4000
3000
2000
1000
0
-1000
Chloride Concentration (mg/kg)
Alder
Crowberry
Green Terrestrial Moss
Bog Blueberry
Plant Species

APPENDIX 35.2A

Sediment Sample Results, Cook Inlet Drainages Study Area, 2004-2007

Appendix 35.2A. Sediment Sample Results, Cook Inlet Drainages Study Area, 2004-2007

Sample Location ID	Total Solids	Chloride	Fluoride	Sulfate	Total Cyanide	Ammonia	Acid Volatile Sulfides	Aluminum	Antimony	Arsenic	Barium	Beryllium	Bismuth	Boron	Cadmium	Cadmium-SEM	Calcium	Chromium	Cobalt	Copper	Copper-SEM	Iron	Lead	Lead-SEM
	percent	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
GS21																								
Sample Date																								
08/18/04		2.29	**0.15**	16.8	0.093	129		16600	**0.077**	5.72	56.1	0.157	**0.0307**	**8.65**	0.198		4880	44.1	12.8	47.2		23000	3.84	
09/26/04		3.55	**0.15**	29.1	**0.054**	10.6		17000	**0.015**	5.27	54.0	0.118	**0.0308**	**5.38**	**0.145**		4840	37.4	12.5	41.6		23900	2.89	
05/03/05		2.28	1.77	18.4	**0.036**	100		18000	**0.015**	7.04	42.3	0.134	**0.0303**	**1.52**	0.241		4840	43.2	13.0	52.8		25300	4.11	
07/13/05	74.8	**0.65**	**0.66**	1.38	**0.015**	45.1		16600	**0.102**	6.16	39.7	**0.102**	**0.203**	**6.55**	**0.409**		5690	32.3	9.8	40.3		21000	3.53	
09/09/05	69.4	**0.89**	**0.72**	11.5	**0.032**	62.8		24400	**0.022**	8.44	63.6	0.143	**0.0433**	4.28	0.344		6640	54.5	17.0	64.7		31700	5.27	
Mean	72.1	1.93	0.69	15.4	0.046	69.5	NA	18520	0.046	6.53	51.1	0.131	0.0675	5.28	0.267	NA	5380	42.3	13.0	49.3	NA	24980	3.93	NA
Median	72.1	2.28	0.66	16.8	0.036	62.8	NA	17000	0.022	6.16	54.0	0.134	0.0308	5.38	0.241	NA	4880	43.2	12.8	47.2	NA	23900	3.84	NA
St. Deviation	3.8	1.18	0.66	10.1	0.030	46.3	NA	3340	0.040	1.25	10.0	0.022	0.0757	2.65	0.108	NA	790	8.3	2.59	9.93	NA	4070	0.88	NA
# of values	2	5	5	5	5	5	0	5	5	5	5	5	5	5	5	0	5	5	5	5	0	5	5	0
Minimum	69.4	0.65	0.15	1.38	0.015	10.6	NA	16600	0.015	5.27	39.7	0.102	0.0303	1.52	0.145	NA	4840	32.3	9.75	40.3	NA	21000	2.89	NA
Maximum	74.8	3.55	1.77	29.1	0.093	129	NA	24400	0.102	8.44	63.6	0.157	0.203	8.65	0.409	NA	6640	54.5	17.0	64.7	NA	31700	5.27	NA
% of values undetected			80%		20%				100%			20%	100%	40%										
# of values between MDL and MRL		2			3									2	2									
GS22																								
Sample Date																								
07/14/05	74.8	**0.88**	**0.21**	**1.2**	**0.015**	**7.5**		13400	**0.049**	3.35	114	**0.106**	**0.0410**	**2.05**	**0.085**		6620	13.4	9.67	62.1		20100	0.81	
09/10/05	81.1	**0.19**	**0.19**	**1.1**	**0.015**	17.5		21600	**0.019**	5.83	92.3	0.130	**0.0375**	44.5	**0.038**		9740	14.4	9.82	54.2		22600	0.94	
Mean	78.0	0.54	0.20	1.2	0.015	13	NA	17500	0.034	4.59	103	0.118	0.0393	23.3	0.061	NA	8180	13.9	9.75	58.2	NA	21350	0.87	NA
Median	78.0	0.54	0.20	1.2	0.015	13	NA	17500	0.034	4.59	103	0.118	0.0393	23.3	0.061	NA	8180	13.9	9.75	58.2	NA	21350	0.87	NA
St. Deviation	4.5	0.49	0.01	0.1	0.000	7.0	NA	5800	0.022	1.75	15.3	0.017	0.0025	30.0	0.034	NA	2210	0.71	0.11	5.59	NA	1770	0.09	NA
# of values	2	2	2	2	2	2	0	2	2	2	2	2	2	2	2	0	2	2	2	2	0	2	2	0
Minimum	74.8	0.19	0.19	1.1	0.015	7.5	NA	13400	0.019	3.35	92.3	0.106	0.0375	2.05	0.038	NA	6620	13.4	9.67	54.2	NA	20100	0.81	NA
Maximum	81.1	0.88	0.21	1.2	0.015	17.5	NA	21600	0.049	5.83	114	0.130	0.0410	44.5	0.085	NA	9740	14.4	9.82	62.1	NA	22600	0.94	NA
% of values undetected		50%	100%		100%				50%				100%	50%	50%									
# of values between MDL and MRL		1		2		1			1			1			1									
POND6																								
Sample Date																								
08/30/06	73.2	**0.90**	**0.21**	3.29	**0.040**	93.4	**0.1**	6470	**0.041**	1.75	14.1	**0.090**	**0.131**	1.68	**0.041**	**0.05**	1480	6.72	2.32	8.70	4.30	7180	1.43	**0.95**
10/04/07	66.0	**0.80**	**0.07**	**3.5**	**0.700**	150		9300	**0.125**	0.83	13.0	**0.069**	**0.315**	**1.25**	**0.048**		800	5.10	1.40	6.00		8100	1.50	
Mean	69.6	0.85	0.14	3.4	0.37	122	0.1	7890	0.083	1.3	13.6	0.080	0.223	1.47	0.044	0.05	1140	5.91	1.86	7.35	4.30	7640	1.47	0.95
Median	69.6	0.85	0.14	3.4	0.37	122	0.1	7890	0.083	1.3	13.6	0.080	0.223	1.47	0.044	0.05	1140	5.91	1.86	7.35	4.30	7640	1.47	0.95
St. Deviation	5.1	0.07	0.10	0.1	0.467	40.0	NA	2000	0.059	0.65	0.8	0.015	0.130	0.30	0.005	NA	480	1.15	0.65	1.91	NA	650	0.05	NA
# of values	2	2	2	2	2	2	1	2	2	2	2	2	2	2	2	1	2	2	2	2	1	2	2	1
Minimum	66.0	0.80	0.07	3.29	0.040	93.4	0.1	6470	0.041	0.83	13.0	0.069	0.131	1.25	0.041	NA	800	5.10	1.40	6.00	4.30	7180	1.43	0.95
Maximum	73.2	0.90	0.21	3.5	0.700	150	0.1	9300	0.125	1.75	14.1	0.090	0.315	1.68	0.048	NA	1480	6.72	2.32	8.70	4.30	8100	1.50	0.95
% of values undetected		50%	100%		50%		100%		50%				100%	50%	50%	100%								100%
# of values between MDL and MRL		1		1	1				1			2			1									

Appendix 35.2A. Sediment Sample Results, Cook Inlet Drainages Study Area, 2004-2007

Sample Location ID	Magnesium mg/kg	Manganese mg/kg	Mercury mg/kg	Mercury-SEM mg/kg	Molybdenum mg/kg	Nickel mg/kg	Nickel-SEM mg/kg	Potassium mg/kg	Selenium mg/kg	Silver mg/kg	Sodium mg/kg	Sulfur mg/kg	Thallium mg/kg	Tin mg/kg	Vanadium mg/kg	Zinc mg/kg	Zinc-SEM mg/kg
GS21																	
Sample Date																	
08/18/04	12600	415	**0.0146**		**0.704**	20.1		574	**0.169**	0.1650	**355**		**0.0031**	**0.495**	77.7	66.2	
09/26/04	12200	457	**0.0275**		**0.518**	20.0		518	**0.204**	**0.0395**	284		**0.0031**	1.90	73.9	64.9	
05/03/05	12900	500	**0.0147**		**0.896**	20.8		504	**0.319**	**0.0152**	287		**0.0031**	**0.489**	86.5	68.6	
07/13/05	10700	373	**0.0079**		**1.02**	15.5		**454**	**0.491**	**0.0203**	**260**		**0.107**	**1.02**	71.4	63.5	
09/09/05	15800	662	**0.0086**		**1.08**	28.2		714	**0.453**	**0.0762**	396		**0.0125**	**0.700**	106	87.2	
Mean	12800	481	0.015	NA	0.843	20.9	NA	553	0.327	0.0632	316	NA	0.0257	0.920	83.1	70.1	NA
Median	12600	457	0.015	NA	0.896	20.1	NA	518	0.319	0.0395	287	NA	0.0031	0.700	77.7	66.2	NA
St. Deviation	1900	111	0.0079	NA	0.231	4.58	NA	100	0.144	0.0617	57	NA	0.0456	0.588	14.0	9.8	NA
# of values	5	5	5	0	5	5	0	5	5	5	5	0	5	5	5	5	0
Minimum	10700	373	0.0079	NA	0.518	15.5	NA	454	0.169	0.0152	260	NA	0.0031	0.489	71.4	63.5	NA
Maximum	15800	662	0.0275	NA	1.08	28.2	NA	714	0.491	0.1650	396	NA	0.107	1.90	106	87.2	NA
% of values undetected			40%		20%				20%	40%			60%	80%			
# of values between MDL and MRL			3		4			1	4	2	2		2				
GS22																	
Sample Date																	
07/14/05	7380	201	**0.0075**		**0.205**	8.67		1800	**0.331**	**0.0205**	910		0.0686	**0.660**	108	36.4	
09/10/05	6290	283	**0.0074**		**0.188**	10.4		1040	**0.354**	**0.0188**	1160		**0.0038**	**0.605**	88.2	35.9	
Mean	6840	242	0.0074	NA	0.196	9.54	NA	1420	0.343	0.0196	1035	NA	0.036	0.633	98.1	36.2	NA
Median	6840	242	0.0074	NA	0.196	9.54	NA	1420	0.343	0.0196	1035	NA	0.036	0.633	98.1	36.2	NA
St. Deviation	770	58	0.0001	NA	0.012	1.22	NA	537	0.016	0.0012	177	NA	0.0459	0.039	14.0	0.4	NA
# of values	2	2	2	0	2	2	0	2	2	2	2	0	2	2	2	2	0
Minimum	6290	201	0.0074	NA	0.188	8.67	NA	1040	0.331	0.0188	910	NA	0.0038	0.605	88.2	35.9	NA
Maximum	7380	283	0.0075	NA	0.205	10.4	NA	1800	0.354	0.0205	1160	NA	0.0686	0.660	108	36.4	NA
% of values undetected			100%		100%				50%	100%			50%	100%			
# of values between MDL and MRL									1								
POND6																	
Sample Date																	
08/30/06	1730	74	**0.0080**	**0.01**	**0.203**	5.13	**3**	**83**	1.81	**0.0203**	335	197	0.0823	**0.655**	35.6	14.7	5.4
10/04/07	980	47	**0.0065**		**0.125**	2.20		**51**	**0.410**	**0.125**	150		**0.125**	**0.002**	30.0	10.0	
Mean	1360	61	0.0072	0.01	0.164	3.67	3	67	1.11	0.0727	243	197	0.104	0.328	32.8	12.4	5
Median	1360	61	0.0072	0.01	0.164	3.67	3	67	1.11	0.0727	243	197	0.104	0.328	32.8	12.4	5
St. Deviation	530	19	0.0010	NA	0.055	2.07	NA	23	0.990	0.0740	131	NA	0.0302	0.462	4.0	3.3	NA
# of values	2	2	2	1	2	2	1	2	2	2	2	1	2	2	2	2	1
Minimum	980	47	0.0065	0.01	0.125	2.20	3	51	0.410	0.0203	150	197	0.0823	0.002	30.0	10.0	5
Maximum	1730	74	0.0080	0.01	0.203	5.13	3	83	1.81	0.125	335	197	0.125	0.655	35.6	14.7	5
% of values undetected			100%	100%	100%		100%			100%			50%	100%			100%
# of values between MDL and MRL								2	1								

Appendix 35.2A. Sediment Sample Results, Cook Inlet Drainages Study Area, 2004-2007

Sample Location ID	Total Solids	Chloride	Fluoride	Sulfate	Total Cyanide	Ammonia	Acid Volatile Sulfides	Aluminum	Antimony	Arsenic	Barium	Beryllium	Bismuth	Boron	Cadmium	Cadmium-SEM	Calcium	Chromium	Cobalt	Copper	Copper-SEM	Iron	Lead	Lead-SEM
	percent	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
PSC																								
Sample Date																								
07/13/05	77.5	**0.20**	**0.20**	1.46	**0.015**	**3.7**		16600	**0.093**	4.37	25.9	0.140	**0.0395**	**4.42**	0.283		6540	17.0	16.2	119		21500	0.44	
Mean	77.5	0.20	0.20	1.46	0.015	3.7	NA	16600	0.093	4.37	25.9	0.140	0.0395	4.42	0.283	NA	6540	17.0	16.2	119	NA	21500	0.44	NA
Median	77.5	0.20	0.20	1.46	0.015	3.7	NA	16600	0.093	4.37	25.9	0.140	0.0395	4.42	0.283	NA	6540	17.0	16.2	119	NA	21500	0.44	NA
St. Deviation	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
# of values	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	0	1	1	1	1	0	1	1	0
Minimum	77.5	0.20	0.20	1.46	0.015	3.7	NA	16600	0.093	4.37	25.9	0.140	0.0395	4.42	0.283	NA	6540	17.0	16.2	119	NA	21500	0.44	NA
Maximum	77.5	0.20	0.20	1.46	0.015	3.7	NA	16600	0.093	4.37	25.9	0.140	0.0395	4.42	0.283	NA	6540	17.0	16.2	119	NA	21500	0.44	NA
% of values undetected		100%	100%		100%	100%							100%											
# of values between MDL and MRL									1					1										
PSD																								
Sample Date																								
07/13/05	75.2	**0.89**	**0.20**	2.62	**0.015**	**3.5**		15500	**0.079**	5.12	15.6	0.192	**0.0409**	**2.04**	0.447		5780	49.6	15.0	58.1		21300	1.62	
Mean	75.2	0.89	0.20	2.62	0.015	3.5	NA	15500	0.079	5.12	15.6	0.192	0.0409	2.04	0.447	NA	5780	49.6	15.0	58.1	NA	21300	1.62	NA
Median	75.2	0.89	0.20	2.62	0.015	3.5	NA	15500	0.079	5.12	15.6	0.192	0.0409	2.04	0.447	NA	5780	49.6	15.0	58.1	NA	21300	1.62	NA
St. Deviation	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	#DIV/0!	NA	NA
# of values	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	0	1	1	1	1	0	1	1	0
Minimum	75.2	0.89	0.20	2.62	0.015	3.5	NA	15500	0.079	5.12	15.6	0.192	0.0409	2.04	0.447	NA	5780	49.6	15.0	58.1	NA	21300	1.62	NA
Maximum	75.2	0.89	0.20	2.62	0.015	3.5	NA	15500	0.079	5.12	15.6	0.192	0.0409	2.04	0.447	NA	5780	49.6	15.0	58.1	NA	21300	1.62	NA
% of values undetected			100%		100%	100%							100%	100%										
# of values between MDL and MRL		1							1															
SW1																								
Sample Date																								
08/30/06	78.4	**0.71**	**0.20**	1.96	**0.014**	13.0		10800	**0.020**	13.1	78.1	**0.064**	**0.126**	1.86	**0.039**	**0.05**	6900	1.95	5.98	18.9	6.4	8510	0.55	**0.6**
10/04/07	38.0	**1.40**	**0.32**	**6.3**	**1.15**	570		18000	**0.230**	3.10	71.0	**0.170**	**0.600**	**2.30**	**0.099**		1900	5.80	5.40	54.0		31000	1.30	
Mean	58.2	1.06	0.26	4.1	0.58	292	NA	14400	0.12	8.10	74.6	0.12	0.363	2.08	0.069	0.05	4400	3.88	5.69	36.5	6.4	19760	0.93	0.6
Median	58.2	1.06	0.26	4.1	0.58	292	NA	14400	0.12	8.10	74.6	0.12	0.363	2.08	0.069	0.05	4400	3.88	5.69	36.5	6.4	19760	0.93	0.6
St. Deviation	28.6	0.49	0.09	3.1	0.80	394	NA	5090	0.149	7.07	5.0	0.075	0.335	0.31	0.042	NA	3540	2.72	0.41	24.8	NA	15900	0.53	NA
# of values	2	2	2	2	2	2	0	2	2	2	2	2	2	2	2	1	2	2	2	2	1	2	2	1
Minimum	38.0	0.71	0.20	1.96	0.014	13.0	NA	10800	0.020	3.10	71.0	0.064	0.126	1.86	0.039	0.1	1900	1.95	5.40	18.9	6.4	8510	0.55	0.6
Maximum	78.4	1.40	0.32	6.3	1.15	570	NA	18000	0.230	13.1	78.1	0.170	0.600	2.30	0.099	0.1	6900	5.80	5.98	54.0	6.4	31000	1.30	0.6
% of values undetected		50%	50%		100%				100%				100%	50%	50%	100%								100%
# of values between MDL and MRL		1	1	1								2			1									

Sample Location ID	Magnesium mg/kg	Manganese mg/kg	Mercury mg/kg	Mercury-SEM mg/kg	Molybdenum mg/kg	Nickel mg/kg	Nickel-SEM mg/kg	Potassium mg/kg	Selenium mg/kg	Silver mg/kg	Sodium mg/kg	Sulfur mg/kg	Thallium mg/kg	Tin mg/kg	Vanadium mg/kg	Zinc mg/kg	Zinc-SEM mg/kg
PSC																	
Sample Date																	
07/13/05	13800	598	**0.0075**		**0.773**	11.7		495	0.967	**0.0198**	148		0.0583	**0.635**	68.4	68.7	
Mean	13800	598	0.0075	NA	0.773	11.7	NA	495	0.967	0.0198	148	NA	0.0583	0.635	68.4	68.7	NA
Median	13800	598	0.0075	NA	0.773	11.7	NA	495	0.967	0.0198	148	NA	0.0583	0.635	68.4	68.7	NA
St. Deviation	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
# of values	1	1	1	0	1	1	0	1	1	1	1	0	1	1	1	1	0
Minimum	13800	598	0.0075	NA	0.773	11.7	NA	495	0.967	0.0198	148	NA	0.0583	0.635	68.4	68.7	NA
Maximum	13800	598	0.0075	NA	0.773	11.7	NA	495	0.967	0.0198	148	NA	0.0583	0.635	68.4	68.7	NA
% of values undetected			100%							100%				100%			
# of values between MDL and MRL					1												
PSD																	
Sample Date																	
07/13/05	12700	483	**0.0078**		**0.517**	20.6		387	0.730	**0.0204**	145		0.0307	**0.660**	61.7	95.1	
Mean	12700	483	0.0078	NA	0.517	20.6	NA	387	0.730	0.0204	145	NA	0.0307	0.660	61.7	95.1	NA
Median	12700	483	0.0078	NA	0.517	20.6	NA	387	0.730	0.0204	145	NA	0.0307	0.660	61.7	95.1	NA
St. Deviation	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
# of values	1	1	1	0	1	1	0	1	1	1	1	0	1	1	1	1	0
Minimum	12700	483	0.0078	NA	0.517	20.6	NA	387	0.730	0.0204	145	NA	0.0307	0.660	61.7	95.1	NA
Maximum	12700	483	0.0078	NA	0.517	20.6	NA	387	0.730	0.0204	145	NA	0.0307	0.660	61.7	95.1	NA
% of values undetected			100%							100%				100%			
# of values between MDL and MRL					1												
SW1																	
Sample Date																	
08/30/06	3260	141	**0.0076**	**0.005**	7.470	5.33	0.3	898	0.657	**0.0196**	699		0.0816	**0.630**	28.9	20.1	4.5
10/04/07	5400	140	**0.0120**		22.0	4.00		1100	1.30	**0.230**	**120**		**0.230**	**0.003**	69.0	24.0	
Mean	4330	141	0.0098	0.005	14.7	4.67	0.3	999	0.979	0.125	410	NA	0.156	0.317	49.0	22.1	4.5
Median	4330	141	0.0098	0.005	14.7	4.67	0.3	999	0.979	0.125	410	NA	0.156	0.317	49.0	22.1	4.5
St. Deviation	1510	1	0.0031	NA	10.3	0.94	NA	143	0.455	0.149	409	NA	0.105	0.443	28.4	2.8	NA
# of values	2	2	2	1	2	2	1	2	2	2	2	0	2	2	2	2	1
Minimum	3260	140	0.0076	0.005	7.47	4.00	0.3	898	0.657	0.0196	120	NA	0.0816	0.003	28.9	20.1	4.5
Maximum	5400	141	0.0120	0.005	22.0	5.33	0.3	1100	1.30	0.230	699	NA	0.230	0.630	69.0	24.0	4.5
% of values undetected			100%	100%						100%			50%	100%			
# of values between MDL and MRL											1						

Appendix 35.2A. Sediment Sample Results, Cook Inlet Drainages Study Area, 2004-2007

Sample Location ID	Total Solids	Chloride	Fluoride	Sulfate	Total Cyanide	Ammonia	Acid Volatile Sulfides	Aluminum	Antimony	Arsenic	Barium	Beryllium	Bismuth	Boron	Cadmium	Cadmium-SEM	Calcium	Chromium	Cobalt	Copper	Copper-SEM	Iron	Lead	Lead-SEM
	percent	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
SW2																								
Sample Date																								
08/30/06	80.6	**0.19**	**0.19**	2.37	**0.015**	15.2	**0.1**	12200	**0.018**	4.52	33.4	0.133	**0.119**	2.94	0.320	0.3	3060	42.0	12.7	41.7	29.4	**2**	3.27	3.1
09/13/07	77.0	**0.70**	**0.39**	**2.0**	**0.550**	31.0		9000	**0.115**	4.80	9.40	**0.130**	**0.295**	**1.15**	**0.115**		970	22.0	6.70	17.0		12000	1.80	
Mean	78.8	0.45	0.29	2.2	0.28	23.1	0.1	10600	0.067	4.66	21.4	0.132	0.207	2.05	0.218	0.3	2020	32.0	9.70	29.4	29.4	6000	2.54	3.1
Median	78.8	0.45	0.29	2.2	0.28	23.1	0.1	10600	0.067	4.66	21.4	0.132	0.207	2.05	0.218	0.3	2020	32.0	9.70	29.4	29.4	6000	2.54	3.1
St. Deviation	2.5	0.36	0.14	0.3	0.38	11.2	NA	2260	0.068	0.20	17.0	0.002	0.124	1.27	0.145	NA	1480	14.1	4.24	17.5	NA	8480	1.04	NA
# of values	2	2	2	2	2	2	1	2	2	2	2	2	2	2	2	1	2	2	2	2	1	2	2	1
Minimum	77.0	0.19	0.19	2.0	0.015	15.2	0.1	9000	0.018	4.52	9.40	0.130	0.119	1.15	0.115	0.3	970	22.0	6.70	17.0	29.4	2	1.80	3.1
Maximum	80.6	0.70	0.39	2.37	0.55	31.0	0.1	12200	0.115	4.80	33.4	0.133	0.295	2.94	0.320	0.3	3060	42.0	12.7	41.7	29.4	12000	3.27	3.1
% of values undetected		100%	100%		100%		100%		100%				100%	50%	50%							50%		
# of values between MDL and MRL				1								1												
SW3																								
Sample Date																								
08/30/06	68.2	1.48	**0.23**	3.41	0.066	91.1	**0.1**	12600	**0.022**	1.75	12.1	**0.081**	**0.142**	2.52	**0.044**	**0.05**	1660	24.8	8.09	15.4	7.9	19100	2.82	1.8
10/04/07	27.0	**4.80**	**0.16**	**6.2**	16.0	320		44000	**0.325**	3.00	44.0	**0.300**	**0.800**	**3.10**	**0.280**		1000	12.0	2.40	34.0		20000	3.90	
Mean	47.6	3.14	0.19	4.8	8.0	206	0.1	28300	0.17	2.38	28.1	0.19	0.471	2.81	0.16	0.05	1330	18.4	5.25	24.7	7.9	19550	3.36	1.8
Median	47.6	3.14	0.19	4.8	8.0	206	0.1	28300	0.17	2.38	28.1	0.19	0.471	2.81	0.16	0.05	1330	18.4	5.25	24.7	7.9	19550	3.36	1.8
St. Deviation	29.1	2.35	0.05	2.0	11.3	162	NA	22200	0.214	0.88	22.6	0.155	0.466	0.41	0.167	NA	470	9.05	4.02	13.2	NA	640	0.76	NA
# of values	2	2	2	2	2	2	1	2	2	2	2	2	2	2	2	1	2	2	2	2	1	2	2	1
Minimum	27.0	1.48	0.16	3.41	0.066	91.1	0.1	12600	0.022	1.75	12.1	0.081	0.142	2.52	0.044	0.1	1000	12.0	2.40	15.4	7.9	19100	2.82	1.8
Maximum	68.2	4.80	0.23	6.2	16.0	320	0.1	44000	0.325	3.00	44.0	0.300	0.800	3.10	0.280	0.1	1660	24.8	8.09	34.0	7.9	20000	3.90	1.8
% of values undetected			100%				100%		100%				100%	50%	50%									
# of values between MDL and MRL		1		1								2			1									
SW4																								
Sample Date																								
08/30/06	77.9	927	**1.09**	157	**0.015**	20.7	**0.1**	10600	**0.019**	4.30	28.6	**0.109**	**0.0386**	5.95	**0.108**	0.1	9960	19.3	8.82	22.3	13.3	15200	1.88	**1**
10/04/07	72.0	**1.60**	**0.06**	5.20	9.30	130		14000	**0.095**	6.50	50.0	**0.120**	**0.250**	**1.00**	0.230		4200	28.0	11.0	49.0		22000	3.40	
Mean	75.0	464	0.58	81.1	4.7	75.4	0.1	12300	0.057	5.40	39.3	0.115	0.144	3.48	0.169	0.1	7080	23.7	9.91	35.7	13.3	18600	2.64	1
Median	75.0	464	0.58	81.1	4.7	75.4	0.1	12300	0.057	5.40	39.3	0.115	0.144	3.48	0.169	0.1	7080	23.7	9.91	35.7	13.3	18600	2.64	1
St. Deviation	4.2	654	0.73	107	6.6	77.3	NA	2400	0.054	1.56	15.1	0.008	0.150	3.50	0.086	NA	4070	6.2	1.54	18.9	NA	4810	1.07	NA
# of values	2	2	2	2	2	2	1	2	2	2	2	2	2	2	2	1	2	2	2	2	1	2	2	1
Minimum	72.0	1.60	0.06	5.20	0.015	20.7	0.1	10600	0.019	4.30	28.6	0.109	0.0386	1.00	0.108	0.1	4200	19.3	8.82	22.3	13.3	15200	1.88	1
Maximum	77.9	927	1.09	157	9.30	130	0.1	14000	0.095	6.50	50.0	0.120	0.250	5.95	0.230	0.1	9960	28.0	11.0	49.0	13.3	22000	3.40	1
% of values undetected			50%		50%		100%		100%				100%	50%										
# of values between MDL and MRL		1	1									2			1									

Appendix 35.2A. Sediment Sample Results, Cook Inlet Drainages Study Area, 2004-2007

Sample Location ID	Magnesium	Manganese	Mercury	Mercury-SEM	Molybdenum	Nickel	Nickel-SEM	Potassium	Selenium	Silver	Sodium	Sulfur	Thallium	Tin	Vanadium	Zinc	Zinc-SEM
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
SW2																	
Sample Date																	
08/30/06	11600	485	**0.0074**	**0.005**	**0.184**	22.8	3.8	506	0.658	**0.0184**	173	199	0.0825	**0.595**	69.8	79.4	30.6
09/13/07	3000	290	0.0092		0.310	10.0		160	0.430	**0.115**	100		**0.115**	**0.290**	52.0	26.0	
Mean	7300	388	0.0083	0.005	0.247	16.4	3.8	333	0.544	0.0667	137	199	0.0988	0.443	60.9	52.7	30.6
Median	7300	388	0.0083	0.005	0.247	16.4	3.8	333	0.544	0.0667	137	199	0.0988	0.443	60.9	52.7	30.6
St. Deviation	6080	138	0.0013	NA	0.089	9.05	NA	245	0.161	0.0683	52	NA	0.0230	0.216	12.6	37.8	NA
# of values	2	2	2	1	2	2	1	2	2	2	2	1	2	2	2	2	1
Minimum	3000	290	0.0074	0.005	0.184	10.0	3.8	160	0.430	0.0184	100	199	0.0825	0.290	52.0	26.0	30.6
Maximum	11600	485	0.0092	0.005	0.310	22.8	3.8	506	0.658	0.115	173	199	0.115	0.595	69.8	79.4	30.6
% of values undetected			50%	100%	50%					100%			50%	100%			
# of values between MDL and MRL			1					1	1		1						
SW3																	
Sample Date																	
08/30/06	8640	318	**0.0086**	**0.005**	**0.219**	17.7	6.5	197	1.85	**0.0219**	205	129	0.110	**0.705**	44.5	28.0	6.6
10/04/07	1500	63	0.100		1.50	3.70		130	3.20	**0.325**	170		**0.325**	**0.800**	64.0	16.0	
Mean	5070	191	0.054	0.005	0.860	10.7	6.5	164	2.53	0.173	188	129	0.218	0.753	54.3	22.0	6.6
Median	5070	191	0.054	0.005	0.860	10.7	6.5	164	2.53	0.173	188	129	0.218	0.753	54.3	22.0	6.6
St. Deviation	5050	180	0.065	NA	0.906	9.90	NA	47	0.95	0.214	25	NA	0.152	0.067	13.8	8.5	NA
# of values	2	2	2	1	2	2	1	2	2	2	2	1	2	2	2	2	1
Minimum	1500	63	0.0086	0.005	0.219	3.70	6.5	130	1.85	0.0219	170	129	0.110	0.705	44.5	16.0	6.6
Maximum	8640	318	0.100	0.005	1.50	17.7	6.5	197	3.20	0.325	205	129	0.325	0.800	64.0	28.0	6.6
% of values undetected			50%	100%	50%					100%			50%	100%			
# of values between MDL and MRL								1			1						
SW4																	
Sample Date																	
08/30/06	8230	380	**0.0077**	**0.01**	**0.193**	14.0	2.7	715	**0.093**	**0.0193**	1420	234	0.0147	**0.620**	46.6	45.6	16.6
10/04/07	12000	380	**0.0060**		1.20	16.0		500	0.340	**0.0950**	250		**0.0950**	**0.001**	57.0	53.0	
Mean	10120	380	0.0069	0.01	0.696	15.0	2.7	608	0.22	0.0571	835	234	0.0549	0.311	51.8	49.3	16.6
Median	10120	380	0.0069	0.01	0.696	15.0	2.7	608	0.22	0.0571	835	234	0.0549	0.311	51.8	49.3	16.6
St. Deviation	2670	0	0.0012	NA	0.712	1.41	NA	152	0.175	0.0536	827	NA	0.0568	0.438	7.4	5.2	NA
# of values	2	2	2	1	2	2	1	2	2	2	2	1	2	2	2	2	1
Minimum	8230	380	0.0060	0.010	0.193	14.0	2.7	500	0.093	0.0193	250	234	0.0147	0.001	46.6	45.6	16.6
Maximum	12000	380	0.0077	0.010	1.20	16.0	2.7	715	0.340	0.0950	1420	234	0.0950	0.620	57.0	53.0	16.6
% of values undetected			100%	100%	50%				50%	100%			50%	100%			
# of values between MDL and MRL									1				1				

Key: **Bold Results** = Parameter undetected by test, value shown is 1/2 MDL or 1/2 MRL.
If result was not detected at the lab MDL, the value shown is 1/2 MDL.
If result was validation flagged U or UJ, the value shown is 1/2 MRL.
Green Results= Estimated result reported by laboratory below method reporting limit.
MDL = Method Detection Limit.
MRL = Method Reporting Limit.
NA = Not Applicable.
SEM = Simultaneously Extractable Metals
Note: All results reported on dry weight basis, except total solids reported on wet weight basis.

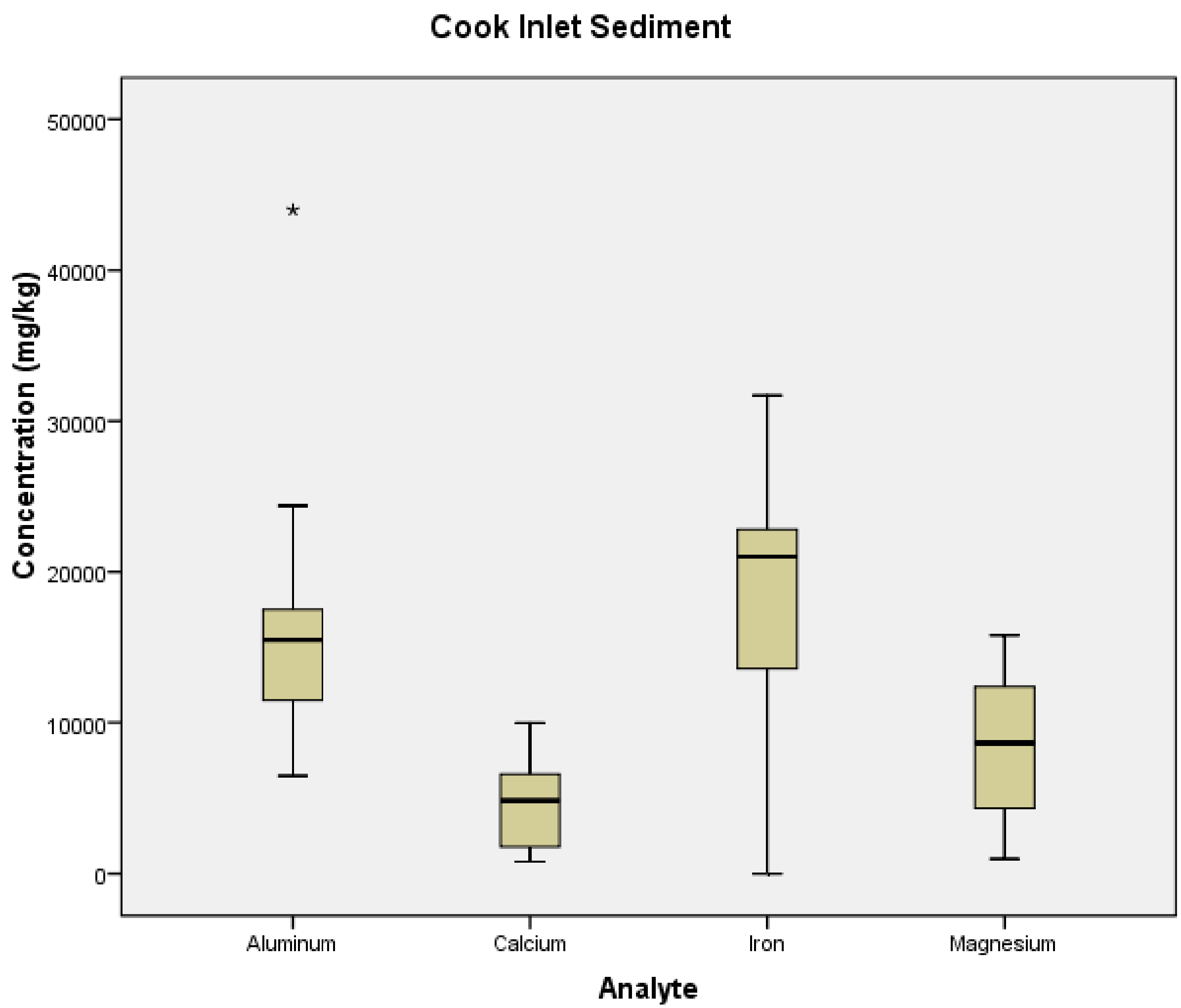
APPENDIX 35.2B

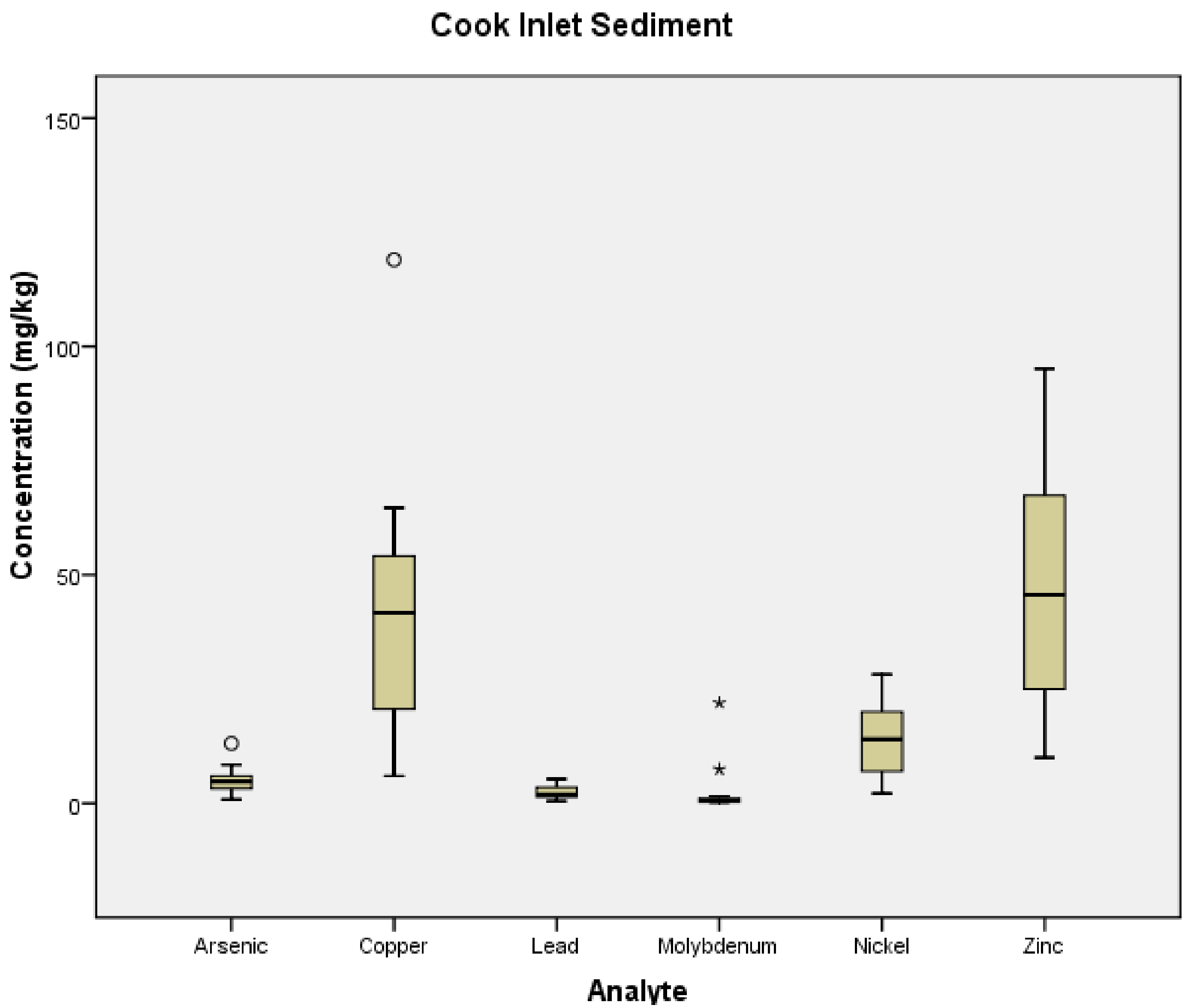
Box-and-Whisker Plots for Sediment Data, Cook Inlet Drainages Study Area

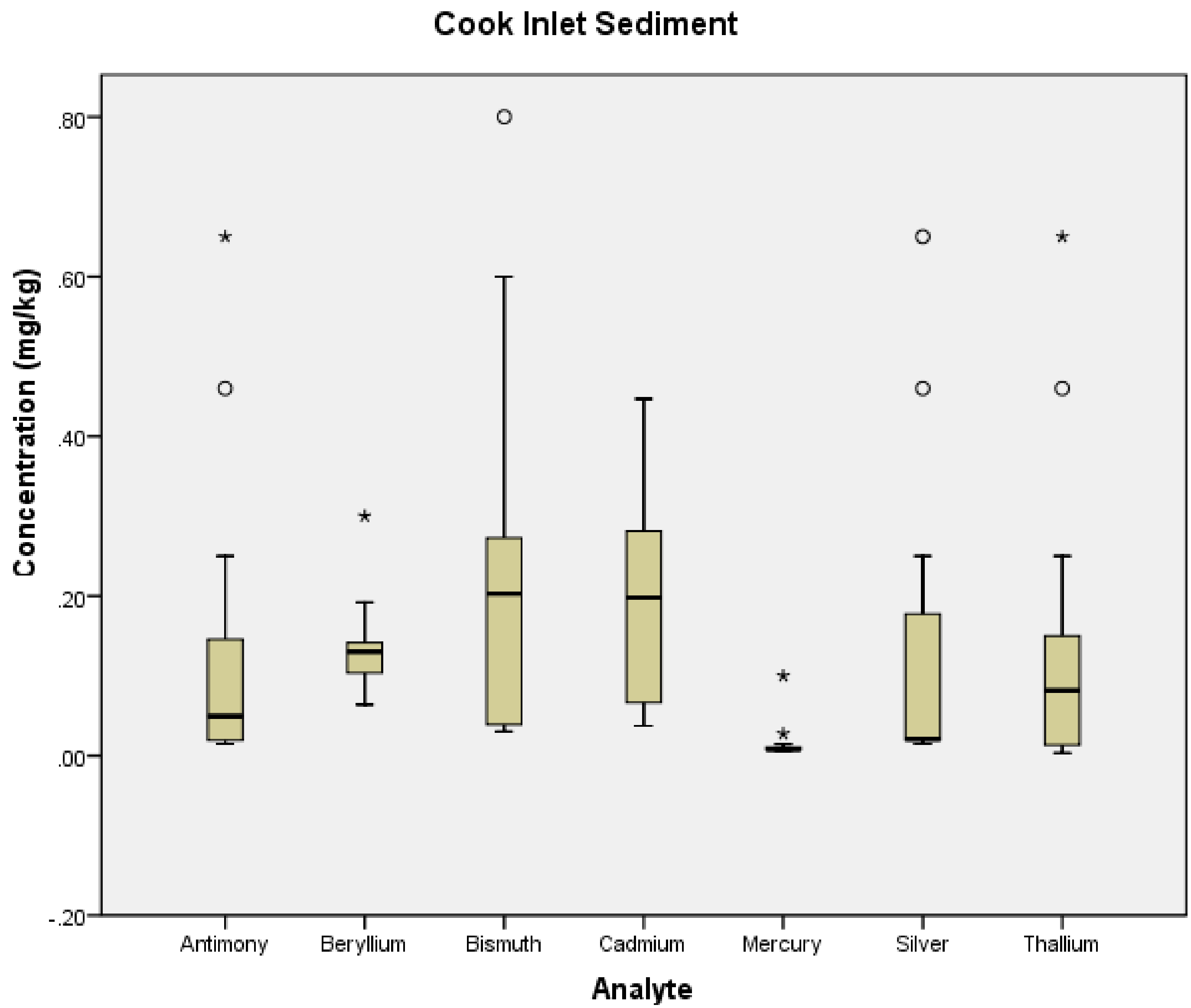
Box-and-Whisker Plots for Sediment Data

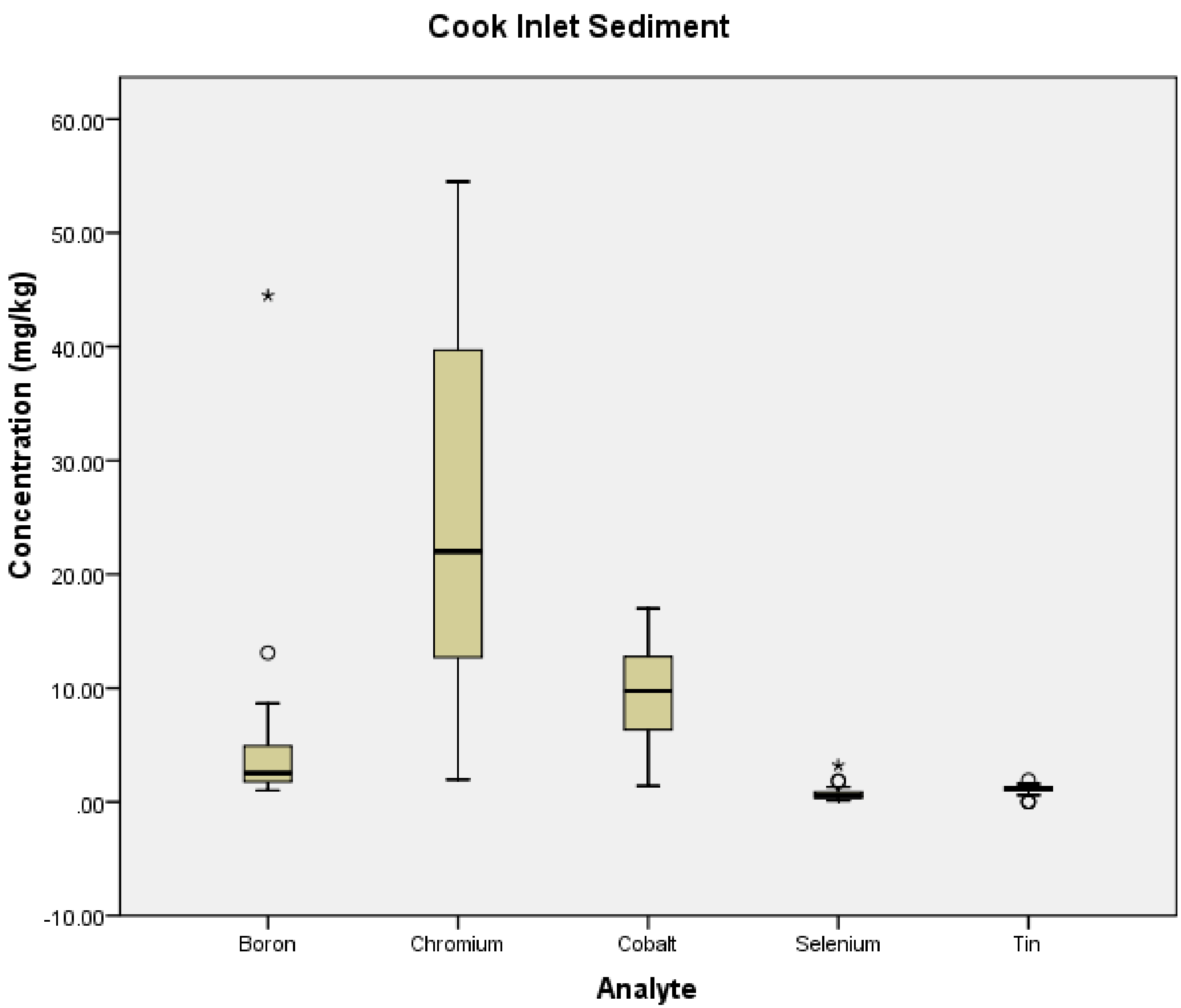
Boxplot Legend: This legend applies to all soil boxplots for Cook Inlet Drainages study area.

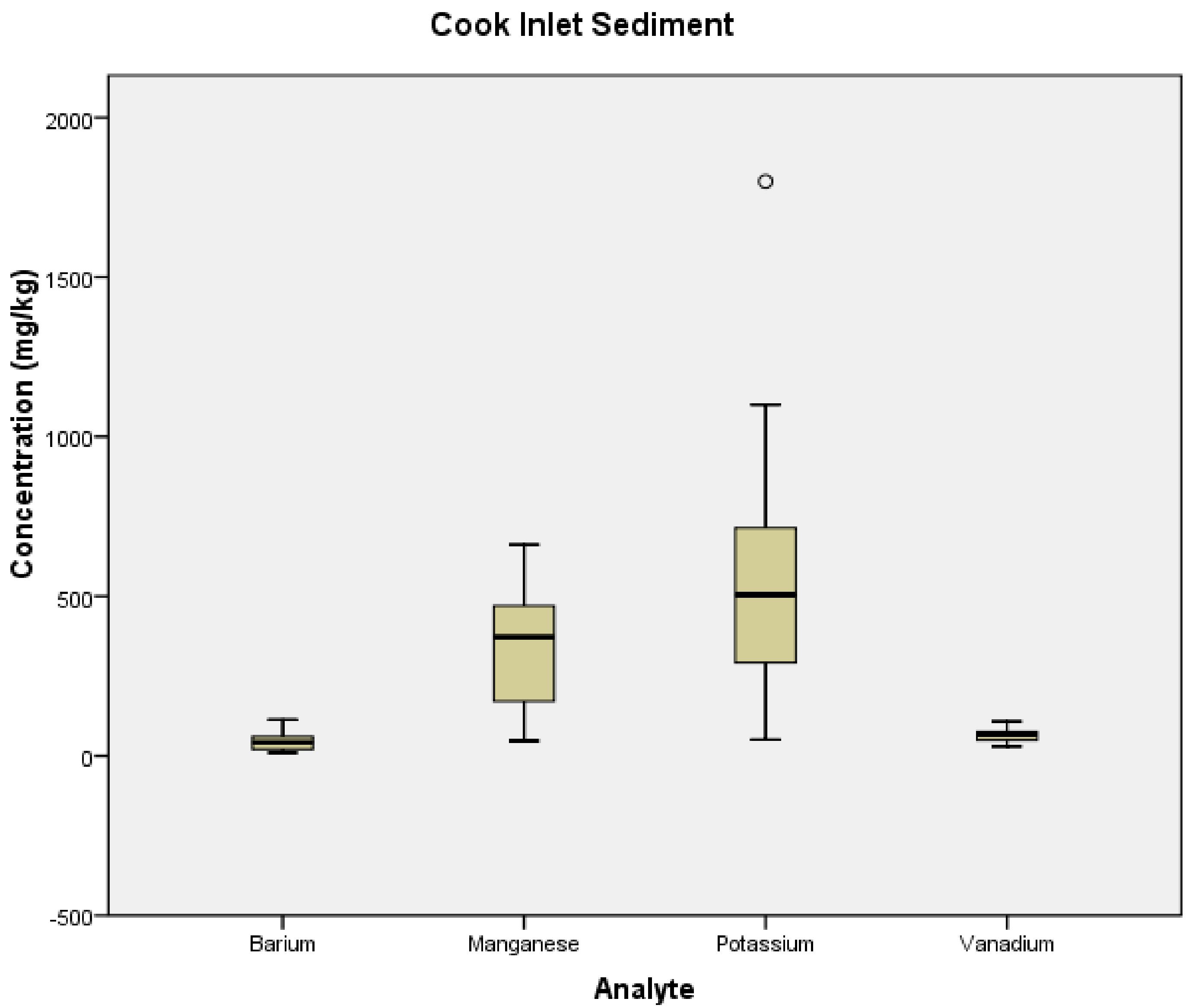
Median 25%-75% Non-outlier Range Outliers Extremes

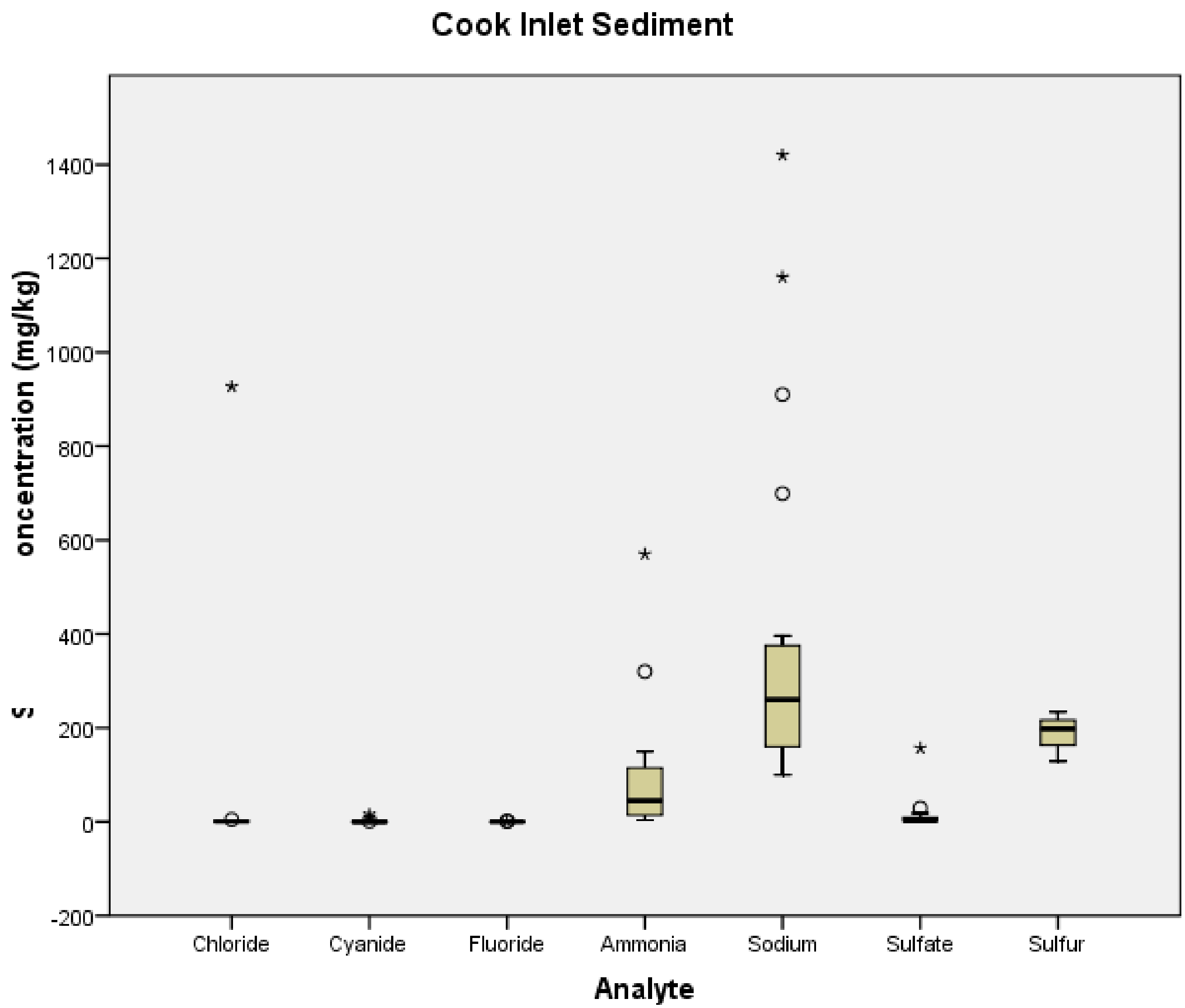



Cook Inlet Sediment
Concentration (mg/kg)
150
100
50
0
Arsenic
Copper
Lead
Molybdenum
Nickel
Zinc
Analyte


Cook Inlet Sediment
Concentration (mg/kg)
.80
.60
.40
.20
.00
-.20
Antimony
Beryllium
Bismuth
Cadmium
Mercury
Silver
Thallium
Analyte


Cook Inlet Sediment
Concentration (mg/kg)
60.00
50.00
40.00
30.00
20.00
10.00
.00
-10.00
Boron
Chromium
Cobalt
Selenium
Tin
Analyte


Cook Inlet Sediment
Concentration (mg/kg)
2000
1500
1000
500
0
-500
Barium
Manganese
Potassium
Vanadium
Analyte


Cook Inlet Sediment
s oncentration (mg/kg)
1400
1200
1000
800
600
400
200
0
-200
Chloride
Cyanide
Fluoride
Ammonia
Sodium
Sulfate
Sulfur
Analyte

APPENDIX 35.3A

Freshwater Fish Sample Results, Cook Inlet Drainages Study Area, 2004-2005

Appendix 35.3A. Freshwater Fish Sample Results, Cook Inlet Drainages Study Area, 2004-2005

Unnamed Creek- *Salvelinus malma Walbaum* -Whole Body Tissue - Age Not Specified

Sample Date	Fish #	Total Solids percent	Antimony mg/kg	Arsenic mg/kg	Beryllium mg/kg	Cadmium mg/kg	Chromium mg/kg	Copper mg/kg	Lead mg/kg	Mercury mg/kg	Methyl Mercury mg/kg	Molybdenum mg/kg	Nickel mg/kg	Selenium mg/kg	Silver mg/kg	Thallium mg/kg	Zinc mg/kg
09/03/04	1	28.1	**0.0025**	0.55		**0.009**		6.85	0.074	0.0587			3.94	1.6	**0.016**		
09/03/04	2	28.4	**0.0025**	0.53		**0.011**		8.08	0.083	0.0486			0.82	1.7	**0.009**		
09/03/04	3	25.9	**0.0025**	**0.33**		0.021		9.61	0.094	0.0858			0.78	1.5	**0.007**		
09/03/04	4	25.5	**0.0025**	0.52		**0.007**		4.84	**0.019**	0.0641			0.53	1.2	**0.006**		
09/03/04	5	28.8	**0.0025**	1.32		**0.0025**		5.51	**0.015**	0.0422			0.4	1.2	**0.008**		
09/03/04	6	26.8	**0.0025**	**0.38**		**0.014**		4.94	0.023	0.113			0.43	1.6	**0.007**		
09/03/04	7	26	**0.0025**	0.75		**0.0025**		4.8	0.021	0.0557			1.2	1	**0.007**		
09/03/04	8	26.5	**0.0025**	0.85		**0.0025**		7.4	0.043	0.0562			3.11	1.4	**0.012**		
09/03/04	9	27	**0.0025**	0.57		**0.01**		9.02	0.037	0.0916			1.35	1	**0.016**		
09/03/04	10	25.4	**0.005**	0.84		**0.009**		5.47	0.028	0.0614			0.67	1.3	**0.007**		
09/03/04	201	28.7	**0.0025**	**0.32**		**0.012**		4.51	**0.015**	0.0162			0.7	**0.8**	**0.002**		
09/03/04	301		**0.01175**	0.5267		**0.0724**		4.5907	**0.01835**	0.0271			4.8043	1.6548	**######**		
Mean		27.0	0.0035	0.6	NA	0.014	NA	6.30	0.039	0.06	NA	NA	1.6	1.3	0.009	NA	NA
Median		26.8	0.0025	0.5	NA	0.01	NA	5.49	0.026	0.057	NA	NA	0.8	1.4	0.008	NA	NA
St. Deviation		1.3	0.0027	0.3	NA	0.019	NA	1.83	0.028	0.027	NA	NA	1.5	0.3	0.004	NA	NA
# of values		11	12	12	NA	12	NA	12	12	12	NA	NA	12	12	12	NA	NA
Minimum		25.4	0.0025	0.32	NA	0.0025	NA	4.51	0.015	0.0162	NA	NA	0.4	0.8	0.002	NA	NA
Maximum		28.8	0.01175	1.32	NA	0.0724	NA	9.61	0.094	0.113	NA	NA	4.8043	1.7	0.016	NA	NA
% of values undetected			92%			33%			8%						17%		
# of values between MDL and MRL			1	3		7			3					1	10		

Road Corr Y Valley Creek (YVC)- *Oncorhynchus kisutch* -Whole Body Tissue - Age Not Specified

Sample Date	Fish #	Total Solids percent	Antimony mg/kg	Arsenic mg/kg	Beryllium mg/kg	Cadmium mg/kg	Chromium mg/kg	Copper mg/kg	Lead mg/kg	Mercury mg/kg	Methyl Mercury mg/kg	Molybdenum mg/kg	Nickel mg/kg	Selenium mg/kg	Silver mg/kg	Thallium mg/kg	Zinc mg/kg
09/03/04	1	21.1	**0.0025**	**0.43**		0.065		5.21	0.105	0.065			1.53	1.5	**0.004**		
09/03/04	2	28.1	**0.0025**	**0.36**		0.036		5.25	0.352	0.0674			1.02	1.1	**0.002**		
09/03/04	3	26.1	**0.0025**	**0.23**		0.041		3.42	0.312	0.0716			0.97	1.3	**0.002**		
09/03/04	4	27	**0.0025**	**0.36**		0.036		3.8	0.11	0.0706			2.37	1	0.293		
09/03/04	5	26.4	**0.0025**	**0.28**		0.035		9.18	0.083	0.068			1.17	1.3	**0.002**		
09/03/04	6	27.5	**0.0025**	**0.22**		0.046		4.05	0.053	0.0741			0.94	1.2	**0.002**		
09/03/04	7	14.8	**0.005**	**0.42**		0.079		10.5	0.191	0.125			1.31	1.1	**0.007**		
09/03/04	8	23.4	**0.0025**	**0.29**		0.062		13	0.069	0.089			1.15	1.2	**0.004**		
09/03/04	9	27.6	**0.0025**	**0.24**		0.038		4.28	0.099	0.0646			0.92	**0.9**	**0.002**		
09/03/04	10	28	**0.0025**	**0.4**		0.038		4.33	0.061	0.0575			0.77	1	**0.005**		
09/03/04	201	27.5	**0.003**	**0.47**		0.113		5.48	0.199	0.0701			0.93	1.8	**0.007**		
09/03/04	301		**0.1185**	0.6303		**0.237**		12.2275	**0.119**	0.0171			189.5735	2.0853	**0.037**		
Mean		25.2	0.0124	0.36	NA	0.069	NA	6.7	0.146	0.07	NA	NA	16.9	1.3	0.031	NA	NA
Median		27	0.0025	0.36	NA	0.044	NA	5.2	0.108	0.069	NA	NA	1.1	1.2	0.004	NA	NA
St. Deviation		4.1	0.0334	0.12	NA	0.058	NA	3.5	0.098	0.024	NA	NA	54.4	0.3	0.083	NA	NA
# of values		11	12	12	NA	12	NA	12	12	12	NA	NA	12	12	12	NA	NA
Minimum		14.8	0.0025	0.22	NA	0.035	NA	3.42	0.053	0.0171	NA	NA	0.77	0.9	0.002	NA	NA
Maximum		28.1	0.1185	0.6303	NA	0.237	NA	13	0.352	0.125	NA	NA	189.574	2.0853	0.293	NA	NA
% of values undetected			92%												42%		
# of values between MDL and MRL			1	11		1			1					1	6		

Appendix 35.3A. Freshwater Fish Sample Results, Cook Inlet Drainages Study Area, 2004-2005

		Total Solids	Antimony	Arsenic	Beryllium	Cadmium	Chromium	Copper	Lead	Mercury	Methyl Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Zinc
		percent	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Y Valley Creek (YVC)- *Salvelinus malma Walbaum* -Whole Body Tissue - Age Not Specified																	
Sample Date	**Fish #**																
08/23/05	1	23.8	**0.004**	0.59	**0.007**	0.399	2.7	5.2	0.36	0.0476		0.18	2.91	3.5	**0.013**	**0.01**	166
08/23/05	2	23.4	**0.004**	0.55	**0.008**	0.237	7.1	17	0.11	0.0394		0.16	5.55	3	**0.01**	0.028	148
08/23/05	3	23.0	**0.004**	**0.31**	**0.0015**	0.139	1.3	3.92	**0.01**	0.0561		0.07	1.52	3.2	**0.007**	0.026	156
08/23/05	4	22.6	**0.004**	**0.43**	**0.0015**	0.148	1.7	4.57	0.06	0.0508		0.18	1.02	2.4	**0.009**	0.023	169
08/23/05	5	22.6	**0.004**	**0.49**	**0.003**	0.12	1.5	6.18	0.05	0.0621		0.13	2.88	2.7	**0.01**	**0.01**	172
08/23/05	6	22.0	**0.004**	**0.3**	**0.0015**	0.078	2	11.5	0.06	0.0683		0.06	1.53	3.1	**0.007**	0.023	135
08/23/05	7	22.7	**0.004**	0.63	**0.01**	0.075	12.3	6.69	0.09	0.046		0.12	14.6	3.1	**0.008**	0.023	143
08/23/05	8	22.7	**0.008**	0.91	**0.015**	0.09	21.5	6.85	0.12	0.0371		0.29	20.6	4.6	**0.01**	0.022	129
08/23/05	9	22.1	**0.004**	**0.47**	**0.005**	0.118	5.4	6.96	0.05	0.0352		0.12	7.55	3.8	**0.012**	0.023	142
08/23/05	10	20.5	**0.004**	0.51	**0.005**	0.122	4.1	7.59	0.07	0.0351		0.15	4.11	3.9	**0.01**	0.026	154
Mean		22.5	0.004	0.52	0.01	0.153	6.0	7.6	0.1	0.0478	NA	0.15	6.2	3.3	0.01	0.021	151
Median		22.7	0.004	0.5	0.01	0.121	3.4	6.8	0.1	0.0468	NA	0.14	3.5	3.2	0.01	0.023	151
St. Deviation		0.9	0.001	0.17	0	0.098	6.4	3.9	0.1	0.0116	NA	0.07	6.5	0.6	0.002	0.006	15
# of values		10	10	10	10	10	10	10	10	10	NA	10	10	10	10	10	10
Minimum		20.5	0.004	0.3	0.0015	0.075	1.3	3.92	0.01	0.0351	NA	0.06	1.02	2.4	0.007	0.01	129
Maximum		23.8	0.008	0.91	0.015	0.399	21.5	17	0.36	0.0683	NA	0.29	20.6	4.6	0.013	0.028	172
% of values undetected			90%		30%				10%							20%	
# of values between MDL and MRL			1	5	7										10		

Key: **Bold Results** = Parameter undetected by test, value shown is 1/2 MDL or 1/2 MRL.
If result was not detected at the lab MDL, the value shown is 1/2 MDL.
If result was flagged U or UJ by validation, the value shown is 1/2 MRL.
Green Results = Estimated result reported by laboratory below method reporting limit.
MDL = Method Detection Limit.
MRL = Method Reporting Limit.
NA = Not Applicable.
Note: All results reported on dry weight basis, except total solids reported on wet weight basis.

APPENDIX 35.4A1

Laboratory Data Summary for Inorganic Constituents in Marine Sediment 2004 through 2008

Location ID	Replicate Number	Sample Date	Total Solids percent	Total Organic Carbon percent	Chloride mg/kg	Fluoride mg/kg	Sulfate mg/kg	Total Cyanide mg/kg	Ammonia mg/kg	Total Kjeldahl Nitrogen mg/kg	Aluminum mg/kg	Antimony mg/kg	Arsenic mg/kg	Barium mg/kg	Beryllium mg/kg	Bismuth mg/kg	Boron mg/kg	Cadmium mg/kg	Calcium mg/kg
MBB	1	21-Jul-05	73.3	0.27	4660	**1.1**	580	**0.035**	13.5	247	17600	0.14	5.93	110	0.261	0.064	**12.9**	0.062	8150
MBB-0	1	18-Jul-08	67.7	0.48				**0.045**			16700	0.10	6.18	92.9				0.05	
MBB-8	1	18-Jul-08	73.4	0.30				**0.045**			16300	0.09	5.19	83.4				0.041	
MBSA1	1	22-Jul-05	82.8	0.16	2380	**0.05**	375	**0.035**	1.3	94	18500	0.06	2.75	26.1	0.073	**0.026**	**13.7**	0.07	9780
MBSA1-0	1	14-Jul-08	68.7	0.33				**0.04**			22400	0.06	4.44	52.6				0.095	
MOPP1	1	31-Aug-04	70.9	0.241	5480	**15.3**	1180	0.078	23	315	12500	**0.183**	5.94	64	0.163	**0.0302**	10.5	**0.0302**	6240
MOPP11	1	18-Jul-08	73.6	0.15				**0.045**			11600	0.06	6.21	62.8				0.034	
MOPP12	2	18-Jul-08	73.0	0.18				**0.045**			11700	0.08	6.50	56.6				0.029	
MOPP13	3	18-Jul-08	75.4	0.21				**0.045**			11800	0.09	6.17	62.0				0.031	
MOPP14	4	18-Jul-08	75.1	0.16				**0.045**			10400	0.07	5.80	56.0				0.029	
MOPP15	5	18-Jul-08	72.9	0.19				**0.045**			23400	0.07	6.24	118				0.037	
		Minimum	70.9	0.15				0.045			10400	0.06	5.80	56.0				0.029	
		Maximum	75.4	0.241				0.078			23400	0.18	6.50	118.0				0.037	
		Median	73.3	0.19				0.045			11750	0.08	6.19	62.4				0.031	
MPS11	1	28-Aug-04	61.5	0.618	9360	1.5	1820	0.15	44.5	837	19100	0.167	8.77	94.4	0.264	**0.125**	**9**	**0.069**	7250
MPS11	2	28-Aug-04	63.3	0.623	6710	**77**	896	0.12	50	603	13200	0.164	9.29	111	0.339	**0.0768**	13.1	**0.0742**	7560
MPS11	1	29-Aug-04		0.423	6200	**0.529**	1370	0.087	53.6	658	14600	0.129	8.48	76.5	0.189	**0.072**	16.4	**0.0844**	11600
MPS12	2	28-Aug-04	64.0	0.576	9310	**0.897**	1050	0.14	56.2	794	19400	0.183	9.99	119	0.339	**0.0835**	10.7	**0.0805**	8770
MPS13	3	29-Aug-04	65.2	0.55	6250	**0.78**	2600	0.1	48.4	640	15800	0.164	8.87	98.1	0.273	**0.0793**	12.4	**0.0642**	7920
MPS14	4	29-Aug-04	64.0	0.568	9060	0.96	2150	0.12	81.6	418	16000	0.162	8.74	106	0.276	**0.0759**	16.9	**0.0649**	8680
MPS15	5	29-Aug-04	55.4	0.996	11200	**77**	2350	0.14	94.1	566	16100	0.228	15.4	133	0.396	**0.163**	38.2	**0.105**	9360
MPS1	1	14-Jul-08	58.0	0.78				**0.04**			20700	0.14	8.04	114				0.072	
MPS1	2	14-Jul-08	58.7	0.64				**0.04**			19400	0.16	8.00	113				0.083	
MPS1	3	14-Jul-08	59.8	0.74				**0.08**			19800	0.16	7.74	114				0.064	
MPS1	4	14-Jul-08	60.3	0.66				**0.04**			19800	0.15	8.15	112				0.099	
MPS1	5	14-Jul-08	60.3	0.76				**0.08**			20800	0.16	7.87	115				0.066	
		Minimum	55.4	0.42	6200	0.53	896	0.04	44.5	418	13200	0.129	7.74	76.5	0.189	0.072	9	0.064	7250
		Maximum	65.2	0.996	11200	77	2600	0.15	94.1	837	20800	0.228	15.4	133	0.396	0.163	38.2	0.105	11600
		Median	60.3	0.63	9060	0.96	1820	0.09	53.6	640	19250	0.16	8.6	113	0.276	0.079	13.1	0.073	8680
MPS1	9	14-Jul-08	67.1	0.64				**0.04**			20200	0.12	6.04	108				0.069	
MPS1L	1	29-Aug-04	71.7	0.135	5150	1.2	996	**0.041**	34.3	302	12700	**0.0436**	3.57	21.9	0.136	**0.03045**	**1.525**	**0.0635**	27200

Replicate Number	Sample Date	Chromium mg/kg	Cobalt mg/kg	Copper mg/kg	Iron mg/kg	Lead mg/kg	Magnesium mg/kg	Manganese mg/kg	Mercury mg/kg	Molybdenum mg/kg	Nickel mg/kg	Potassium mg/kg	Selenium mg/kg	Silver mg/kg	Sodium mg/kg	Thallium mg/kg	Tin mg/kg	Vanadium mg/kg
1	21-Jul-05	14.0	9.3	25.6	27200	3.93	6370	309	0.036	1.17	12.2	3280	**0.3**	0.056	6220	0.072	**3.95**	90.8
1	18-Jul-08	14.5	6.56	14.6	23800	5.21		416	0.073		11.7		**0.5**	0.067			**4.1**	
1	18-Jul-08	11.4	6.80	13.6	23000	4.55		318	0.030		9.26		**0.2**	0.061			**5.45**	
1	22-Jul-05	10.0	13.6	36.6	29600	2.08	14900	714	0.022	0.431	7.68	1120	**0.1**	0.058	2330	**0.017**	**4.25**	77.6
1	14-Jul-08	18.4	8.87	27.5	31200	4.30		689	**0.016**		12.1		**0.15**	0.077			0.36	
1	31-Aug-04	14.5	6.99	12.4	23700	3.26	6190	325	0.0169	**0.151**	11.9	2060	**0.356**	**0.0485**	5580	0.0368	**0.487**	63.2
1	18-Jul-08	11.7	6.60	9.22	21600	4.69		332	**0.019**		10.2		**0.2**	0.033			**5.75**	
2	18-Jul-08	12.3	6.81	9.81	21600	4.79		337	0.022		10.8		**0.2**	0.035			**5.45**	
3	18-Jul-08	12.0	6.62	9.94	21900	4.80		345	0.025		10.6		**0.2**	0.038			**5.3**	
4	18-Jul-08	11.6	6.45	9.63	19500	4.52		297	0.023		10.1		**0.2**	0.030			**5.1**	
5	18-Jul-08	12.6	6.62	10.5	39200	4.81		649	0.022		11.0		**0.5**	0.046			**5.6**	
	Minimum	11.6	6.45	9.22	19500	3.26		297	0.017		10.1		0.2	0.030			0.487	
	Maximum	14.5	6.99	12.4	39200	4.81		649	0.025		11.9		0.5	0.049			5.75	
	Median	12.2	6.62	9.88	21750	4.74		335	0.022		10.7		0.2	0.037			5.38	
1	28-Aug-04	26.4	10.3	31.0	32200	5.32	7950	402	0.0422	**0.977**	22.7	2550	0.670	0.113	3570	0.164	**0.498**	62.1
2	28-Aug-04	28.5	11.1	33.5	27200	5.53	8230	435	0.0551	**0.554**	24.1	2280	0.606	0.126	4710	0.0863	1.08	66.7
1	29-Aug-04	21.2	9.59	22.4	28900	4.34	8860	456	**0.0232**	**0.671**	17.1	2700	0.557	0.101	20500	0.0617	1.00	67.4
2	28-Aug-04	31.7	12.4	36.2	31700	6.09	10100	475	0.0388	**0.679**	26.9	3370	0.864	0.121	6820	0.0947	1.19	75.1
3	29-Aug-04	26.6	10.6	29.4	27000	5.17	8460	411	0.0252	**0.802**	22.3	2660	0.866	0.110	7140	0.102	1.05	64.6
4	29-Aug-04	26.9	11.0	31.4	26400	5.47	9430	411	0.0325	**0.775**	23.5	3120	0.873	0.113	14000	0.0948	1.04	65.7
5	29-Aug-04	36.1	13.9	46.7	26700	7.82	13100	600	0.0578	1.20	31.2	3610	1.36	0.162	17800	0.196	1.23	79.0
1	14-Jul-08	22.8	8.40	20.1	29500	7.20		461	0.046		17.9		**0.6**	0.084			0.57	
2	14-Jul-08	22.7	8.22	20.3	29100	7.30		453	0.049		17.5		**0.5**	0.085			0.62	
3	14-Jul-08	21.6	8.09	19.8	29000	6.90		446	0.047		17.2		**0.7**	0.096			0.60	
4	14-Jul-08	22.9	8.84	21.9	28300	7.51		450	0.044		18.3		**0.6**	0.086			0.62	
5	14-Jul-08	21.7	8.26	20.5	29900	6.86		466	0.041		17.4		**0.5**	0.097			0.60	
	Minimum	21.2	8.09	19.8	26400	4.34	7950	402	0.0232	0.554	17.1	2280	0.5	0.084	3570	0.062	0.498	62.1
	Maximum	36.1	13.9	46.7	32200	7.82	13100	600	0.0578	1.200	31.2	3610	1.36	0.162	20500	0.196	1.23	79.0
	Median	24.7	9.9	25.9	28950	6.48	8860	452	0.043	0.775	20.3	2700	0.6	0.106	7140	0.095	0.81	66.7
9	14-Jul-08	20.1	7.84	19.7	28700	6.93		422	0.043		16.2		**0.5**	0.087			0.59	
1	29-Aug-04	23.5	8.38	18.2	17600	2.51	7020	405	0.0064	**0.1525**	13.7	**869**	**0.0735**	**0.0508**	3110	**0.00305**	**0.4915**	50.3

Replicate Number	Sample Date	Zinc mg/kg	Cadmium-SEM mg/kg	Copper-SEM mg/kg	Lead-SEM mg/kg	Mercury-SEM mg/kg	Nickel-SEM mg/kg	Zinc-SEM mg/kg	Acid Volatile Sulfide mg/kg
1	21-Jul-05	47.0							
1	18-Jul-08	34.7	**0.1**	16.0	6.0	**7.5**	11.7	43.0	17.6
1	18-Jul-08	33.1	**0.1**	15.0	5.3	**7.5**	9.4	45.1	79.9
1	22-Jul-05	35.1							
1	14-Jul-08	43.7	**0.4**	25.9	**2.1**	**10**	7.1	31.6	1.7
1	31-Aug-04	39.1							
1	18-Jul-08	29.6	**0.1**	9.0	5.4	**7.5**	9.0	32.0	**0.5**
2	18-Jul-08	30.4	**0.1**	9.2	5.1	**8**	9.7	32.4	**0.9**
3	18-Jul-08	30.5	**0.1**	10.3	5.6	**8**	9.9	33.7	**0.1**
4	18-Jul-08	28.6	**0.05**	10.3	4.8	**5.5**	11.3	33.8	**0.1**
5	18-Jul-08	31.4	**0.05**	4.2	2.3	**3**	4.3	14.1	**0.1**
	Minimum	28.6	0.1	4.2	2.3	3	4.3	14.1	0.1
	Maximum	39.1	0.1	10.3	5.6	8	11.3	33.8	0.9
	Median	30.5	0.1	9.2	5.1	7.5	9.7	32.4	0.1
1	28-Aug-04	66.9							
2	28-Aug-04	71.5							
1	29-Aug-04	60.2							
2	28-Aug-04	79.9							
3	29-Aug-04	66.5							
4	29-Aug-04	68.9							
5	29-Aug-04	90.1							
1	14-Jul-08	46.9	**0.4**	24.8	7.2	**10**	21.8	61.4	6.3
2	14-Jul-08	47.3	**0.4**	25.9	8.0	**10**	21.4	66.7	22.2
3	14-Jul-08	45.2	**0.4**	24.7	7.7	**10**	20.1	63.2	6.0
4	14-Jul-08	49.5	**0.4**	26.6	8.0	**10**	21.4	64.8	4.4
5	14-Jul-08	47.2	**0.45**	25.3	8.3	**10**	20.5	64.7	4.4
	Minimum	45.2	0.4	24.7	7.2	10	20.1	61.4	4.4
	Maximum	90.1	0.45	26.6	8.3	10	21.8	66.7	22.2
	Median	63.4	0.4	25.3	8.0	10	21.4	64.7	6.0
9	14-Jul-08	44.0	**0.35**	25.6	7.7	**5**	19.0	63.2	155
1	29-Aug-04	40.3							

Location ID	Replicate Number	Sample Date	Total Solids	Total Organic Carbon	Chloride	Fluoride	Sulfate	Total Cyanide	Ammonia	Total Kjeldahl Nitrogen	Aluminum	Antimony	Arsenic	Barium	Beryllium	Bismuth	Boron	Cadmium	Calcium
			percent	percent	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
MPS1M	1	29-Aug-04	76.9	0.109	1830	**0.688**	372	0.057	15.5	142	11100	**0.033**	2.43	15.9	0.114	**0.0309**	**1.545**	**0.0726**	27900
MPS1A	1	21-Jul-05	79.6	0.66	2890	**0.05**	461	**0.11**	0.50	71	12200	0.07	2.97	14.8	0.091	**0.023**	**9.1**	0.067	36700
MPS2	1	31-Aug-04		0.578	33400	**15.3**	10100	0.092	51.6	653	13400	0.178	9.48	116	0.258	**0.0982**	16.4	**0.0821**	7590
MPS21		27-Aug-04	62.7																
MPS22		27-Aug-04	63.1																
MPS22	2	28-Aug-04		0.812	23300	**3.33**	2540	0.1	101	1070	16400	0.168	11.7	116	0.322	**0.067**	23.4	**0.093**	8860
MPS23	3	28-Aug-04	62.1	0.564	37800	1.55	3400	0.13	82.5	1050	13100	0.15	9.7	103	0.272	**0.03055**	**6.46**	**0.067**	5920
MPS24	4	28-Aug-04	67.9	0.431	6650	**0.38**	1260	0.11	53.1	690	13100	0.143	9.66	77.9	0.234	**0.0296**	**5.68**	**0.0296**	7840
MPS25	5	28-Aug-04	60.2	0.498	5910	**0.394**	617	0.11	58.6	734	20100	0.172	11.8	112	0.321	**0.0731**	**9.02**	**0.0717**	10100
		Minimum	60.2	0.431	5910	0.38	617	0.1	51.6	653	13100	0.143	9.48	77.9	0.234	0.0296	5.68	0.0296	5920
		Maximum	67.9	0.812	37800	15.3	10100	0.13	101	1070	20100	0.178	11.8	116	0.322	0.0982	23.4	0.093	10100
		Median	62.7	0.564	23300	1.55	2540	0.11	58.6	734	13400	0.168	9.7	112	0.272	0.067	9.02	0.072	7840
MPS2L	1	27-Aug-04	72.8	0.735	1500	**0.87**	1840	0.07	71.2	803	18100	0.147	12.6	107	**0.15**	**0.135**	**8.74**	**0.03**	7140
MPS2	1	19-Jul-05	64.9	0.58	7580	**0.2**	908	**0.035**	17.8	528	16700	0.14	10.4	109	0.293	0.146	**17.1**	0.072	7300
MPS2-0	1	18-Jul-08	48.3	0.97				**0.045**			16400	0.14	7.82	101				0.071	
		Minimum	48.3	0.58				0.035			16400	0.14	7.82	101				0.030	
		Maximum	72.8	0.97				0.07			18100	0.15	12.6	109				0.072	
		Median	64.9	0.74				0.05			16700	0.14	10.4	107				0.071	
MPS2M	1	27-Aug-04	73.9	0.376	9370	**0.499**	1340	0.062	35.5	526	15500	0.0981	6.64	44.8	0.188	**0.0723**	11.3	**0.02985**	20500
MPS3-0	1	14-Jul-08	71.9	1.21				**0.18**			13200	0.13	4.13	58.7				0.055	
MPS3M	1	31-Aug-04	63.7	0.507	25100	**15.45**	4170	0.092	48.9	680	17700	**0.0856**	6.53	57.9	0.216	**0.03055**	11.9	**0.03055**	7080
MPS3	1	22-Jul-05	58.6	0.88	9530	**0.2**	1060	**0.035**	20.2	886	20000	0.14	12.1	129	0.404	0.206	22.2	**0.082**	7940
		Minimum	58.6	0.51				0.035			13200	0.0856	4.13	58				0.031	
		Maximum	71.9	1.21				0.18			20000	0.14	12.1	129				0.082	
		Median	63.7	0.88				0.09			17700	0.13	6.53	59				0.055	
MPS3L	1	31-Aug-04	42.3	1.28	12800	**14.95**	2210	0.20	506	1690	17800	0.168	20.7	122	0.344	**0.114**	11.4	**0.088**	7000
MPS3-0	1	17-Jul-08	57.7	0.81				**0.045**			17100	0.14	7.53	102				0.075	
MPS3-8	1	17-Jul-08	65.4	0.69				**0.045**			17500	0.14	5.62	101				0.077	

Replicate Number	Sample Date	Chromium mg/kg	Cobalt mg/kg	Copper mg/kg	Iron mg/kg	Lead mg/kg	Magnesium mg/kg	Manganese mg/kg	Mercury mg/kg	Molybdenum mg/kg	Nickel mg/kg	Potassium mg/kg	Selenium mg/kg	Silver mg/kg	Sodium mg/kg	Thallium mg/kg	Tin mg/kg	Vanadium mg/kg
1	29-Aug-04	32.4	8.58	18.6	15700	2.31	7430	376	0.0044	**0.1545**	16.2	**543**	**0.075**	**0.0498**	1810	**0.0031**	**0.4985**	56.4
1	21-Jul-05	19.3	7.9	18.8	16400	2.37	6940	345	**0.015**	0.131	13.2	796	**0.1**	0.024	3290	**0.017**	**3.65**	41.8
1	31-Aug-04	30.4	11.5	33.5	22600	5.92	11100	445	0.0496	**0.805**	25.6	2710	1.16	0.130	13000	0.136	1.12	70.2
	27-Aug-04								0.0458									
	27-Aug-04								0.0521									
2	28-Aug-04	27.6	10.9	30.5	28600	5.37	10800	510	0.0412	**0.775**	23.8	3730	1.60	0.136	24900	0.0793	1.04	65.9
3	28-Aug-04	26.4	10.3	28.5	22500	4.95	7990	453	0.0166	**0.553**	22.2	2260	0.638	0.115	3560	0.0833	**0.4925**	63.0
4	28-Aug-04	20.5	9.65	21.9	22100	4.26	7300	383	0.0215	**0.448**	17.4	2130	0.549	**0.0874**	4790	0.0685	**0.4775**	60.4
5	28-Aug-04	28.3	12.6	31.0	34600	5.82	9070	480	0.0377	**0.606**	23.5	3310	0.593	0.120	4650	0.0756	1.12	81.0
	Minimum	20.5	9.65	21.9	22100	4.26	7300	383	0.0166	0.448	17.4	2130	0.549	0.087	3560	0.069	0.4775	60.4
	Maximum	30.4	12.6	33.5	34600	5.92	11100	510	0.0521	0.805	25.6	3730	1.60	0.136	24900	0.136	1.12	81.0
	Median	27.6	10.9	30.5	22600	5.37	9070	453	0.041	0.606	23.5	2710	0.638	0.120	4790	0.079	1.04	65.9
1	27-Aug-04	31.3	11.4	31.8	29800	6.13	9590	486	0.0538	**0.787**	26.4	2980	**0.4**	0.098	6480	**0.003**	1.16	69.9
1	19-Jul-05	29.3	10.9	35.3	27600	7.21	9390	423	0.051	0.770	24.1	3090	**0.6**	0.090	6910	0.135	**3.85**	63.8
1	18-Jul-08	19.6	7.00	18.4	27300	7.19		416	0.054		15.3		**0.6**	0.111			**4.75**	
	Minimum	19.6	7.00	18.4	27300	6.13		416	0.051		15.3		0.4	0.090			1.16	
	Maximum	31.3	11.4	35.3	29800	7.21		486	0.054		26.4		0.6	0.111			4.75	
	Median	29.3	10.9	31.8	27600	7.19		423	0.054		24.1		0.6	0.098			3.85	
1	27-Aug-04	17.1	9.06	18.5	27500	3.1	7580	504	0.0081	**0.728**	13.4	1510	**0.364**	**0.0896**	4460	0.178	**0.4815**	66.6
1	14-Jul-08	13.3	5.53	20.7	20300	3.65		283	0.028		9.74		**0.6**	0.077			0.36	
1	31-Aug-04	22.9	13.7	56.8	24700	2.57	12400	538	0.0146	**0.487**	16.7	1570	**0.483**	0.102	2700	0.0394	**0.493**	70.3
1	22-Jul-05	33.6	12.6	45.6	31000	8.64	11000	483	0.060	1.06	31.0	3960	**0.8**	0.123	8080	0.166	**3.3**	74.6
	Minimum	13.3	5.53	20.7	20300	2.57		283	0.0146		9.74		0.483	0.077			0.36	
	Maximum	33.6	13.7	56.8	31000	8.64		538	0.060		31.0		0.8	0.123			3.3	
	Median	22.9	12.6	45.6	24700	3.65		483	0.028		16.7		0.6	0.102			0.5	
1	31-Aug-04	34.0	12.1	40.8	32600	6.53	11300	503	0.0479	2.34	27.8	3580	0.80	0.153	12700	0.110	1.16	71.2
1	17-Jul-08	21.2	7.95	23.6	27100	7.15		425	0.054		16.7		**0.6**	0.134			**4.45**	
1	17-Jul-08	19.9	7.43	22.8	26300	7.20		392	0.100		15.2		**0.5**	0.125			**4.35**	

Replicate Number	Sample Date	Zinc mg/kg	Cadmium-SEM mg/kg	Copper-SEM mg/kg	Lead-SEM mg/kg	Mercury-SEM mg/kg	Nickel-SEM mg/kg	Zinc-SEM mg/kg	Acid Volatile Sulfide mg/kg
1	29-Aug-04	40.4							
1	21-Jul-05	31.0							
1	31-Aug-04	75.6							
	27-Aug-04								
	27-Aug-04								
2	28-Aug-04	68.8							
3	28-Aug-04	64.7							
4	28-Aug-04	55.9							
5	28-Aug-04	74.0							
	Minimum	55.9							
	Maximum	75.6							
	Median	68.8							
1	27-Aug-04	75.0							
1	19-Jul-05	75.9							
1	18-Jul-08	41.8	**0.1**	22.7	7.0	**8**	18.1	57.8	12.5
	Minimum	41.8							
	Maximum	75.9							
	Median	75.0							
1	27-Aug-04	53.3							
1	14-Jul-08	30.5	**0.9**	22.4	**4.55**	**20**	9.3	32.7	211
1	31-Aug-04	66.5							
1	22-Jul-05	98.4							
	Minimum	30.5							
	Maximum	98.4							
	Median	66.5							
1	31-Aug-04	83.9							
1	17-Jul-08	46.2	**0.1**	29.0	8.1	**10**	19.0	63.3	119
1	17-Jul-08	43.0	**0.1**	28.7	8.5	**9.5**	20.7	69.7	656

Location ID	Replicate Number	Sample Date	Total Solids	Total Organic Carbon	Chloride	Fluoride	Sulfate	Total Cyanide	Ammonia	Total Kjeldahl Nitrogen	Aluminum	Antimony	Arsenic	Barium	Beryllium	Bismuth	Boron	Cadmium	Calcium
			percent	percent	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
MPS41	1	29-Aug-04	57.4	0.73	15500	**77**	1870	0.13	71.5	852	18900	0.145	10.8	107	0.378	0.102	20.0	**0.0296**	8450
MPS41		30-Aug-04		0.229	7310	**14.95**	1330	**0.0295**	32.9	248	13700	0.0512	5.92	40.0	0.131	**0.03045**	**1.52**	**0.03045**	12500
MPS41		30-Aug-04		0.381	15000	34.7	4030	0.07	54.7	530	14100	0.0823	9.00	69.3	0.201	**0.0303**	6.32	**0.0303**	9010
MPS42	2	29-Aug-04	53.7	1.1	5860	2.91	1380	0.091	88.7	1120	20700	0.207	14.8	129	0.312	0.17	18.8	0.0635	8400
MPS43	3	29-Aug-04	54.6	1.17	18600	**77.5**	4720	0.17	121	1700	20000	0.217	15.4	126	0.351	0.135	32.5	0.106	8430
MPS44	4	30-Aug-04	67.2	0.308	14700	**15.2**	3570	**0.0295**	62.1	468	13200	0.106	7.89	73.4	**0.1535**	**0.0307**	8.96	**0.0307**	7360
MPS45	5	30-Aug-04	64.0	0.61	12800	**15.15**	2580	0.066	84.5	814	15600	0.138	11.3	87.4	**0.149**	0.0981	11.5	**0.02985**	15100
MPS4	1	12-Jul-08	63.5	0.64				**0.04**			20700	0.12	7.65	99.6				0.062	
MPS4	2	12-Jul-08	66.2	0.45				**0.04**			19500	0.08	7.07	78.6				0.046	
MPS4	3	12-Jul-08	74.1	0.50				**0.04**			17100	0.09	6.14	70.3				0.043	
MPS4	4	12-Jul-08	66.7	0.66				**0.04**			18700	0.10	6.54	79.0				0.044	
MPS4	5	12-Jul-08	70.6	0.58				**0.04**			17700	0.10	6.22	85.7				0.059	
		Minimum	53.7	0.23	5860	2.91	1330	0.03	32.9	248	13200	0.0512	5.92	40.0	0.131	0.0303	1.52	0.0296	7360
		Maximum	74.1	1.17	18600	77.5	4720	0.17	121	1700	20700	0.217	15.4	129	0.378	0.17	32.5	0.106	15100
		Median	65.1	0.60	14700	15.2	2580	0.04	71.5	814	18200	0.103	7.77	82	0.201	0.098	11.5	0.044	8450
MPS4L	1	30-Aug-04	58.2	0.782	27000	**14.85**	4020	0.079	96.0	1260	15300	0.11	11.1	84.0	0.234	**0.03045**	10.6	**0.03045**	11000
MPS4	1	22-Jul-05	65.4	0.58	6940	**0.2**	735	**0.035**	23.0	527	14000	0.12	6.77	65.3	0.178	0.080	14.5	0.069	23800
MPS4M	1	30-Aug-04	62.7	0.521	28300	**15.15**	3860	0.067	59.2	539	14200	0.0808	6.66	68.2	0.168	**0.03065**	11.5	**0.03065**	18100
MPS4-0	1	14-Jul-08	90.6	0.48				**0.04**			13700	0.08	2.54	25.7				0.056	
MPSEM	1	31-Aug-04	61.0	0.632	6860	**15.4**	1220	0.12	71.2	1030	14900	0.136	9.33	103	0.269	0.0821	9.76	0.0638	5650
MPSEU	1	22-Jul-05		0.93	8660	**0.2**	1010	0.07	14.1	819	20600	0.19	12.9	133	0.383	0.231	19.9	0.081	6600
MPSE	1	14-Jul-08	58.8	0.71				3.62			19900	0.11	7.20	108				0.067	
		Minimum		0.63				0.07			14900	0.11	7.20	103				0.0638	
		Maximum		0.93				3.62			20600	0.19	12.9	133				0.081	
		Median		0.71				0.12			19900	0.14	9.33	108				0.067	
MWGI	1	30-Aug-04		0.461	27200	**15.35**	6310	0.14	51.1	761	12800	0.148	9.67	65.5	0.227	0.0764	9.55	0.0708	22800

Notes:

Bold Results = Parameter undetected by test, value shown is 1/2 MDL or 1/2 MRL.

If result was not detected at the lab MDL, the value shown is 1/2 MDL.

If result was validation flagged U or UJ, the value shown is 1/2 MRL.

Green Results = Estimated result reported by laboratory below reporting limit (MRL).

MDL = Method Detection Limit.

MRL = Method Reporting Limit.

NA = Not Applicable.

SEM = Simultaneously Extracted Metals

All results reported on dry weight basis

Replicate Number	Sample Date	Chromium mg/kg	Cobalt mg/kg	Copper mg/kg	Iron mg/kg	Lead mg/kg	Magnesium mg/kg	Manganese mg/kg	Mercury mg/kg	Molybdenum mg/kg	Nickel mg/kg	Potassium mg/kg	Selenium mg/kg	Silver mg/kg	Sodium mg/kg	Thallium mg/kg	Tin mg/kg	Vanadium mg/kg
1	29-Aug-04	31.8	12.1	34.6	29300	6.50	10300	545	0.0477	**0.694**	25.6	3270	0.574	0.101	10400	**0.00295**	1.12	69.6
	30-Aug-04	33.0	10.9	20.4	27400	2.92	9510	474	**0.0183**	**0.152**	18.8	1400	**0.33**	**0.0152**	4570	**0.00305**	**0.491**	94.2
	30-Aug-04	21.8	9.81	20.9	21200	4.12	8280	382	**0.0288**	**0.344**	16.8	2410	**0.354**	**0.055**	8990	**0.00305**	**0.489**	57.2
2	29-Aug-04	37.5	14.4	47.3	32800	8.55	11400	660	0.0616	**0.785**	32.6	3800	0.667	0.146	8290	**0.00305**	1.31	78.4
3	29-Aug-04	35.9	14.4	47.7	33700	7.83	13000	615	0.0721	0.982	30.9	4530	1.3	0.182	26000	0.152	1.21	76.7
4	30-Aug-04	22.4	9.03	17.9	22500	3.76	6980	428	0.0266	**0.47**	17.6	2000	**0.441**	**0.0435**	8470	**0.00305**	**0.4955**	62.3
5	30-Aug-04	26.8	11.2	28.0	24000	5.38	8230	540	0.0454	**0.792**	22.3	2640	**0.473**	**0.0917**	9160	**0.003**	1.05	62.8
1	12-Jul-08	19.6	8.30	18.7	29000	6.42		473	0.038		14.9		**0.5**	0.105			0.53	
2	12-Jul-08	16.0	7.99	14.7	25500	5.48		448	0.024		12.0		**0.2**	0.054			0.41	
3	12-Jul-08	14.6	6.82	12.0	23000	4.74		396	0.023		10.4		**0.4**	0.048			0.50	
4	12-Jul-08	16.1	7.47	13.8	24700	5.14		434	0.026		12.0		**0.2**	0.054			0.49	
5	12-Jul-08	17.9	7.08	16.1	24300	5.76		374	0.042		13.2		**0.6**	0.078			0.49	
	Minimum	14.6	6.82	12.0	21200	2.92	6980	374	0.0183	0.152	10.4	1400	0.2	0.015	4570	0.00295	0.41	57.2
	Maximum	37.5	14.4	47.7	33700	8.55	13000	660	0.0721	0.982	32.6	4530	1.3	0.182	26000	0.152	1.31	94.2
	Median	22.1	9.4	19.6	25100	5.43	9510	461	0.033	0.694	17.2	2640	0.5	0.067	8990	0.00305	0.50	69.6
1	30-Aug-04	28.2	10.2	25.8	25300	4.54	9250	514	0.0305	**0.575**	22.4	2600	0.596	**0.0884**	11000	**0.00305**	1.07	62.4
1	22-Jul-05	21.1	10.1	26.3	22900	4.18	8890	433	0.038	0.493	18.2	2480	**0.4**	0.075	6340	0.081	**3.85**	57.2
1	30-Aug-04	24.4	8.9	24.8	21600	3.50	7980	397	0.0364	**0.402**	18.5	1950	**0.428**	**0.0557**	6730	**0.00305**	1.06	56.7
1	14-Jul-08	13.6	6.64	18.4	18700	1.52		429	**0.003**		8.41		**0.2**	**0.0085**			**0.085**	
1	31-Aug-04	28.7	10.0	32.7	24400	5.16	8660	389	0.0456	**0.808**	22.8	2630	**0.435**	0.126	5970	0.103	1.02	61.1
1	22-Jul-05	37.8	13.9	51.2	32900	10.4	11800	509	0.068	1.26	33.5	3950	**0.8**	0.138	7660	0.183	**9.2**	76.3
1	14-Jul-08	22.7	8.13	23.9	29300	6.99		450	0.049		16.4		**0.5**	0.117			0.55	
	Minimum	22.7	8.13	23.9	24400	5.16		389	0.0456		16.4		0.435	0.117			0.55	
	Maximum	37.8	13.9	51.2	32900	10.4		509	0.068		33.5		0.8	0.138			9.2	
	Median	28.7	10.0	32.7	29300	6.99		450	0.049		22.8		0.5	0.126			1.0	
1	30-Aug-04	20.0	10.2	24.7	21600	3.69	9180	438	**0.0339**	**0.778**	16.4	2060	0.668	**0.0977**	13300	0.192	**0.4945**	58.3

Replicate Number	Sample Date	Zinc mg/kg	Cadmium-SEM mg/kg	Copper-SEM mg/kg	Lead-SEM mg/kg	Mercury-SEM mg/kg	Nickel-SEM mg/kg	Zinc-SEM mg/kg	Acid Volatile Sulfide mg/kg
1	29-Aug-04	76.7							
	30-Aug-04	51.0							
	30-Aug-04	55.7							
2	29-Aug-04	93.7							
3	29-Aug-04	89.4							
4	30-Aug-04	52.0							
5	30-Aug-04	65.2							
1	12-Jul-08	42.1	**0.35**	22.3	6.3	**5**	16.0	53.6	23.7
2	12-Jul-08	36.3	**0.4**	16.6	5.8	**10**	11.9	43.6	17.6
3	12-Jul-08	31.5	**0.35**	15.4	4.7	**5**	11.1	40.8	4.2
4	12-Jul-08	35.4	**0.35**	16.2	5.7	**10**	12.3	43.0	43.1
5	12-Jul-08	37.4	**0.35**	20.8	5.9	**5**	15.1	48.6	12.1
	Minimum	31.5	0.35	15.4	4.7	5	11.1	40.8	4.2
	Maximum	93.7	0.40	22.3	6.3	10	16.0	53.6	43.1
	Median	51.5	0.35	16.6	5.8	5	12.3	43.6	17.6
1	30-Aug-04	62.3							
1	22-Jul-05	48.7							
1	30-Aug-04	53.7							
1	14-Jul-08	25.0	**0.95**	3.8	**4.85**	**20**	**0.95**	4.6	**0.1**
1	31-Aug-04	67.7							
1	22-Jul-05	101							
1	14-Jul-08	46.4	**0.45**	28.8	7.9	**10**	17.7	57.9	2.4
	Minimum	46.4							
	Maximum	101							
	Median	67.7							
1	30-Aug-04	55.0							

Location ID	Replicate Number	Sample Date	Total Solids	Total Organic Carbon	Chloride	Fluoride	Sulfate	Total Cyanide	Ammonia	Total Kjeldahl Nitrogen	Aluminum	Antimony	Arsenic	Barium	Beryllium	Bismuth	Boron	Cadmium	Calcium
			percent	percent	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg

1mg/kg = 1,000 µg/kg

Replicate Number	Sample Date	Chromium	Cobalt	Copper	Iron	Lead	Magnesium	Manganese	Mercury	Molybdenum	Nickel	Potassium	Selenium	Silver	Sodium	Thallium	Tin	Vanadium
		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg

Replicate Number	Sample Date	Zinc	Cadmium-SEM	Copper-SEM	Lead-SEM	Mercury-SEM	Nickel-SEM	Zinc-SEM	Acid Volatile Sulfide
		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg

APPENDIX 35.4A2

Laboratory Data Summary for Organic Constituents in Marine Sediment
2004 through 2008

Location ID	Replicate Number	Sample Date	1-Methyl-naphthalene	1-Methyl-phenanthrene	2,6-Dimethyl-naphthalene	2-Methyl-naphthalene	Ace-naphthene	Ace-naphthylene	Anthracene	Benzene	Benzo(a) anthracene	Benzo(a)-pyrene	Benzo(b)-fluoranthene	Benzo(e)-pyrene
			µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	mg/kg	µg/kg	µg/kg	µg/kg	µg/kg
MBB	1	21-Jul-05				1.4	0.11	0.155	0.155	0.0075	0.11	0.155	0.33	
MBB-0	1	18-Jul-08	8.3	5.7	9.9	10.3	0.05	0.05	0.9		1.2	0.45	2.0	1.9
MBB-8	1	18-Jul-08	4.1	3.5	3.4	5.1	0.05	0.05	0.05		0.7	0.3	1.1	0.9
MBSA1	1	22-Jul-05				0.45	0.10	0.135	0.135	0.0065	0.10	0.135	0.29	
MBSA1-0	1	14-Jul-08	1.9	1.2	2.3	2.7	0.05	0.05	0.05		0.5	0.3	0.9	0.7
MOPP1	1	31-Aug-04								0.000535				
MOPP11	1	18-Jul-08	1.4	1.2	1.5	1.8	0.05	0.05	0.05		0.15	0.25	0.5	0.5
MOPP12	2	18-Jul-08	1.7	1.3	1.7	2.2	0.05	0.05	0.05		0.15	0.25	0.6	0.5
MOPP13	3	18-Jul-08	2.8	1.6	2.9	3.5	0.05	0.05	0.05		0.4	0.3	0.9	0.8
MOPP14	4	18-Jul-08	3.0	1.7	2.8	3.8	0.05	0.05	0.05		0.5	0.4	1.0	0.8
MOPP15	5	18-Jul-08	2.5	1.7	2.5	3.4	0.05	0.05	0.05		0.5	0.3	1.0	0.9
		Minimum	1.4	1.2	1.5	1.8	0.05	0.05	0.05		0.2	0.3	0.5	0.5
		Maximum	3.0	1.7	2.9	3.8	0.05	0.05	0.05		0.5	0.4	1.0	0.9
		Median	2.5	1.6	2.5	3.4	0.05	0.05	0.05		0.4	0.3	0.9	0.8
MPS11	2	28-Aug-04												
MPS11	1	28-Aug-04								0.00056				
MPS11	1	29-Aug-04												
MPS12	2	28-Aug-04								0.000695				
MPS13	3	29-Aug-04								0.00063				
MPS14	4	29-Aug-04								0.000655				
MPS15	5	29-Aug-04								0.00066				
MPS1	1	14-Jul-08	6.0	3.7	7.1	8.1	0.05	0.05	0.5		0.9	0.4	2.3	2.2
MPS1	2	14-Jul-08	6.9	4.5	8.9	9.8	0.05	0.05	0.05		1.0	0.4	2.9	2.6
MPS1	3	14-Jul-08	5.4	3.7	7.0	7.7	0.05	0.05	0.05		0.8	0.9	2.2	2.4
MPS1	4	14-Jul-08	6.5	4.0	6.4	8.5	0.05	0.05	0.05		0.8	0.4	2.2	2.1
MPS1	5	14-Jul-08	6.2	4.0	7.9	8.8	0.05	0.05	0.05		1.0	0.7	2.5	2.4
		Minimum	5.4	3.7	6.4	7.7	0.05	0.05	0.05		0.8	0.4	2.2	2.1
		Maximum	6.9	4.5	8.9	9.8	0.05	0.05	0.50		1.0	0.9	2.9	2.6
		Median	6.2	4.0	7.1	8.5	0.05	0.05	0.05		0.9	0.4	2.3	2.4
MPS1	9	14-Jul-08	7.3	4.9	7.9	10.1	0.05	0.05	0.05		1.0	0.35	2.8	2.5

Location ID	Replicate Number	Sample Date	Benzo(g,h,i)-perylene	Benzo(k)-fluoranthene	Biphenyl	C1 - Naphthalenes	C10 as n-Decane	C11 as n-Undecane	C12 as n-Dodecane	C13 as n-Tridecane	C14 as n-Tetradecane	C15 as n-Pentadecane	C16 as n-Hexadecane	C17 as n-Heptadecane
			µg/kg	µg/kg	µg/kg	µg/kg	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g
MBB	1	21-Jul-05	**0.16**	**0.23**										
MBB-0	1	18-Jul-08	1.1	**0.25**	4.3	18.6	0.0424	0.0304	0.0441	0.0454	0.0441	**0.0209**	**0.0302**	0.0756
MBB-8	1	18-Jul-08	0.7	**0.15**	2.0	9.2	0.0184	0.0194	0.0255	0.0249	0.0204	**0.0134**	**0.01945**	**0.0140**
MBSA1	1	22-Jul-05	**0.14**	**0.20**										
MBSA1-0	1	14-Jul-08	0.4	0.8	1.0	4.7	0.0168	**0.0056**	0.0198	0.0190	0.0215	**0.01265**	**0.0183**	0.0307
MOPP1	1	31-Aug-04												
MOPP11	1	18-Jul-08	**0.2**	**0.15**	1.2	3.3	0.0077	0.0162	0.0219	0.0196	0.0165	**0.01225**	**0.01775**	**0.0128**
MOPP12	2	18-Jul-08	**0.2**	**0.15**	1.2	3.8	0.0065	0.0140	**0.00945**	0.0184	0.0165	**0.01225**	**0.01775**	**0.0128**
MOPP13	3	18-Jul-08	**0.25**	**0.15**	1.5	6.4	0.0099	0.0226	0.0297	0.0244	0.0237	**0.0135**	**0.0195**	**0.0141**
MOPP14	4	18-Jul-08	**0.3**	**0.2**	1.9	6.7	0.0106	0.0237	0.0318	0.0293	0.0257	**0.0174**	**0.02515**	**0.01815**
MOPP15	5	18-Jul-08	0.5	**0.15**	1.7	5.9	0.0104	0.0220	0.0317	0.0309	0.0317	0.0275	**0.01965**	**0.01415**
		Minimum	0.2	0.2	1.2	3.3	0.0065	0.0140	0.0095	0.0184	0.0165	0.0123	0.0178	0.0128
		Maximum	0.5	0.2	1.9	6.7	0.0106	0.0237	0.0318	0.0309	0.0317	0.0275	0.0252	0.0182
		Median	0.3	0.2	1.5	5.9	0.0099	0.0220	0.0297	0.0244	0.0237	0.0135	0.0195	0.0141
MPS11	2	28-Aug-04												
MPS11	1	28-Aug-04												
MPS11	1	29-Aug-04												
MPS12	2	28-Aug-04												
MPS13	3	29-Aug-04												
MPS14	4	29-Aug-04												
MPS15	5	29-Aug-04												
MPS1	1	14-Jul-08	**0.3**	2.3	2.6	14.1	0.0094	0.0215	0.0284	0.0266	0.0276	**0.0174**	**0.0252**	0.0766
MPS1	2	14-Jul-08	1.6	2.8	3.3	16.7	0.0794	0.0323	0.0391	0.0390	0.0342	**0.01825**	**0.0264**	0.1061
MPS1	3	14-Jul-08	1.3	2.1	2.3	13.0	0.0423	0.0256	0.0356	0.0352	0.0298	**0.0160**	**0.0232**	0.0851
MPS1	4	14-Jul-08	**0.3**	2.1	3.3	15.0	**0.00435**	0.0187	**0.0140**	0.0238	0.0227	**0.0181**	**0.0262**	0.0747
MPS1	5	14-Jul-08	1.4	2.4	2.8	15.0	0.0454	0.0219	0.0272	0.0270	0.0268	**0.01575**	**0.0228**	0.0889
		Minimum	0.3	2.1	2.3	13.0	0.0044	0.0187	0.0140	0.0238	0.0227	0.0158	0.0228	0.0747
		Maximum	1.6	2.8	3.3	16.7	0.0794	0.0323	0.0391	0.0390	0.0342	0.0183	0.0264	0.1061
		Median	1.3	2.3	2.8	15.0	0.0423	0.0219	0.0284	0.0270	0.0276	0.0174	0.0252	0.0851
MPS1	9	14-Jul-08	1.4	2.7	3.4	17.5	0.0118	0.0294	0.0339	0.0317	0.0337	0.0477	**0.0224**	0.1414

Location ID	Replicate Number	Sample Date	C18 as n-Octadecane	C19 as n-Nonadecane	C1-Chrysenes	C1-Dibenzo-thiophenes	C1-Fluoranthenes/ Pyrenes	C1-Fluorenes	C1-Phenanthrenes/ Anthracenes	C2 - Fluoranthenes/ Pyrenes	C20 as n-Eicosane	C21 as n-Henei-cosane	C22 as n-Do-cosane	C23 as n-Tri-cosane	C24 as n-Tetra-cosane
			µg/g	µg/g	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/g	µg/g	µg/g	µg/g	µg/g
MBB	1	21-Jul-05													
MBB-0	1	18-Jul-08	**0.0298**	0.0462	5.5	1.9	2.5	3.2	20.0	**1.0**	**0.02245**	0.0482	0.0361	0.0880	**0.0219**
MBB-8	1	18-Jul-08	**0.01915**	**0.0123**	3.7	1.1	1.7	1.1	8.6	4.8	**0.01445**	**0.0144**	**0.01055**	0.0246	0.1239
MBSA1	1	22-Jul-05													
MBSA1-0	1	14-Jul-08	**0.01805**	**0.01155**	**0.4**	**0.05**	**0.6**	**0.05**	1.1	**0.6**	0.0383	0.0426	0.0276	0.0426	0.0382
MOPP1	1	31-Aug-04													
MOPP11	1	18-Jul-08	**0.0175**	**0.0112**	1.8	0.6	**0.6**	0.8	3.9	**0.6**	**0.0132**	**0.01315**	**0.00965**	**0.0076**	**0.01285**
MOPP12	2	18-Jul-08	**0.0175**	**0.0112**	1.7	0.6	**0.6**	**0.05**	4.6	**0.6**	**0.0132**	**0.01315**	**0.00965**	**0.0076**	**0.01285**
MOPP13	3	18-Jul-08	**0.01925**	0.0261	2.5	0.8	**0.65**	1.4	5.2	**0.65**	**0.0145**	**0.01445**	**0.0106**	0.0233	**0.01415**
MOPP14	4	18-Jul-08	**0.0248**	**0.0159**	2.7	0.9	**0.8**	1.4	5.3	**0.8**	**0.0187**	**0.01865**	**0.0137**	0.0262	**0.01825**
MOPP15	5	18-Jul-08	**0.01935**	0.0372	2.7	0.8	**0.65**	1.4	5.1	**0.65**	**0.0146**	**0.01455**	**0.0107**	0.0242	**0.0142**
		Minimum	0.0175	0.0112	1.7	0.6	0.6	0.1	3.9	0.6	0.0132	0.0132	0.0097	0.0076	0.0129
		Maximum	0.0248	0.0372	2.7	0.9	0.8	1.4	5.3	0.8	0.0187	0.0187	0.0137	0.0262	0.0183
		Median	0.0193	0.0159	2.5	0.8	0.7	1.4	5.1	0.7	0.0145	0.0145	0.0106	0.0233	0.0142
MPS11	2	28-Aug-04													
MPS11	1	28-Aug-04													
MPS11	1	29-Aug-04													
MPS12	2	28-Aug-04													
MPS13	3	29-Aug-04													
MPS14	4	29-Aug-04													
MPS15	5	29-Aug-04													
MPS1	1	14-Jul-08	**0.02485**	0.0455	1.8	0.6	**0.8**	1.0	3.3	**0.8**	**0.0187**	0.0406	0.0318	0.0855	0.0435
MPS1	2	14-Jul-08	**0.02605**	0.0929	2.2	0.8	**0.85**	1.9	4.2	**0.85**	0.0494	0.0561	0.0482	0.1087	0.0525
MPS1	3	14-Jul-08	**0.02285**	0.0454	1.9	0.6	**0.75**	1.3	3.3	**0.75**	**0.01725**	0.0500	0.0426	0.0856	0.0399
MPS1	4	14-Jul-08	**0.02585**	0.0469	1.9	0.6	**0.85**	1.3	3.4	**0.85**	**0.0195**	0.0524	**0.01425**	0.0860	0.0416
MPS1	5	14-Jul-08	**0.02245**	0.0549	2.2	0.7	**0.75**	1.6	3.8	**0.75**	**0.01695**	0.0481	0.0370	0.0867	0.0425
		Minimum	0.0225	0.0454	1.8	0.6	0.75	1.0	3.3	0.8	0.0170	0.0406	0.0143	0.0855	0.0399
		Maximum	0.0261	0.0929	2.2	0.8	0.85	1.9	4.2	0.9	0.0494	0.0561	0.0482	0.1087	0.0525
		Median	0.0249	0.0469	1.9	0.6	0.80	1.3	3.4	0.8	0.0187	0.0500	0.0370	0.0860	0.0425
MPS1	9	14-Jul-08	**0.0221**	0.0574	2.5	0.8	**0.75**	1.5	4.4	**0.75**	**0.01665**	0.0578	0.0396	0.0993	0.0553

Location ID	Replicate Number	Sample Date	C25 as n-Penta-cosane	C26 as n-Hexa-cosane	C27 as n-Hepta-cosane	C28 as n-Octa-cosane	C29 as n-Nona-cosane	C2-Chrysenes	C2-Dibenzo-thiophenes	C2-Fluorenes	C2-Naphthalenes	C3 - Fluoranthenes / Pyrenes	C30 as n-Tri-acontane	C31 as n-Hentri-acontane	C32 as n-Dotri-acontane
			µg/g	µg/g	µg/g	µg/g	µg/g	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/g	µg/g	µg/g
MBB	1	21-Jul-05													
MBB-0	1	18-Jul-08	0.1720	0.0437	0.3820	0.0419	0.2345	5.1	1.9	8.6	15.9	**1.0**	**0.02265**	0.1790	**0.0187**
MBB-8	1	18-Jul-08	0.0639	0.0177	0.1126	**0.0112**	0.0786	2.6	1.2	1.8	8.6	**0.65**	**0.01455**	0.0539	**0.0120**
MBSA1	1	22-Jul-05													
MBSA1-0	1	14-Jul-08	0.0882	0.0382	0.2667	0.0309	0.1591	**0.4**	**0.05**	**0.05**	0.8	**0.6**	0.1430	0.1263	**0.0113**
MOPP1	1	31-Aug-04													
MOPP11	1	18-Jul-08	0.0197	0.0091	0.0385	**0.0102**	0.0333	1.4	0.6	4.9	3.1	**0.6**	0.0267	0.0241	**0.01095**
MOPP12	2	18-Jul-08	0.0232	0.0108	0.0472	**0.0102**	0.0391	1.5	0.7	3.0	3.9	**0.6**	**0.0133**	0.0275	**0.01095**
MOPP13	3	18-Jul-08	0.0401	0.0149	0.0871	**0.01125**	0.0610	2.2	0.9	2.3	7.3	**0.65**	**0.0146**	0.0449	**0.01205**
MOPP14	4	18-Jul-08	0.0328	0.0145	0.0616	**0.0145**	0.0461	2.4	1.1	1.6	7.3	**0.8**	**0.01885**	0.0307	**0.01555**
MOPP15	5	18-Jul-08	0.0396	0.0152	0.0796	**0.0113**	0.0610	2.1	1.0	2.0	6.5	**0.65**	**0.0147**	0.0424	**0.01215**
		Minimum	0.0197	0.0091	0.0385	0.0102	0.0333	1.4	0.6	1.6	3.1	0.6	0.0133	0.0241	0.0110
		Maximum	0.0401	0.0152	0.0871	0.0145	0.0610	2.4	1.1	4.9	7.3	0.8	0.0267	0.0449	0.0156
		Median	0.0328	0.0145	0.0616	0.0113	0.0461	2.1	0.9	2.3	6.5	0.7	0.0147	0.0307	0.0121
MPS11	2	28-Aug-04													
MPS11	1	28-Aug-04													
MPS11	1	29-Aug-04													
MPS12	2	28-Aug-04													
MPS13	3	29-Aug-04													
MPS14	4	29-Aug-04													
MPS15	5	29-Aug-04													
MPS1	1	14-Jul-08	0.1489	0.0449	0.3682	0.0424	0.2575	**0.55**	**0.05**	**0.05**	2.7	**0.8**	0.0634	0.1911	**0.01555**
MPS1	2	14-Jul-08	0.1922	0.0542	0.4615	0.0500	0.3063	**0.55**	**0.05**	**0.05**	3.1	**0.85**	0.0606	0.2268	0.0354
MPS1	3	14-Jul-08	0.1558	0.0428	0.3769	0.0350	0.2463	**0.5**	**0.05**	**0.05**	2.5	**0.75**	0.0529	0.1841	0.0425
MPS1	4	14-Jul-08	0.1563	0.0445	0.3878	0.0461	0.3008	**0.55**	**0.05**	**0.05**	2.9	**0.85**	0.0515	0.1870	0.0357
MPS1	5	14-Jul-08	0.1586	0.0454	0.4104	0.0406	0.2697	**0.5**	**0.05**	**0.05**	2.8	**0.75**	0.0512	0.1960	0.0352
		Minimum	0.1489	0.0428	0.3682	0.0350	0.2463	0.5	0.05	0.05	2.5	0.75	0.0512	0.1841	0.0156
		Maximum	0.1922	0.0542	0.4615	0.0500	0.3063	0.6	0.05	0.05	3.1	0.85	0.0634	0.2268	0.0425
		Median	0.1563	0.0449	0.3878	0.0424	0.2697	0.6	0.05	0.05	2.8	0.80	0.0529	0.1911	0.0354
MPS1	9	14-Jul-08	0.1957	0.0625	0.6182	0.0562	0.3295	**0.45**	0.5	**0.05**	3.3	**0.75**	0.0357	0.2601	**0.01385**

Location ID	Replicate Number	Sample Date	C33 as n-Tritri-acontane	C34 as n-Tetratri-acontane	C35 as n-Pentatri-acontane	C3-Chrysenes	C3-Dibenzo-thiophenes	C3-Fluorenes	C3-Naphthalenes	C3-Phenanthrenes/ Anthracenes	C4-Chrysenes	C4-Naphthalenes	C4-Phenanthrenes/ Anthracenes	Chrysene	Dibenzo(a,h) anthracene
			µg/g	µg/g	µg/g	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg
MBB	1	21-Jul-05												**0.28**	**0.18**
MBB-0	1	18-Jul-08	0.0564	**0.0230**	**0.0219**	1.9	**0.05**	5.6	9.6	8.0	**0.65**	2.8	1.9	3.9	**0.2**
MBB-8	1	18-Jul-08	0.0225	**0.0148**	**0.01405**	1.7	**0.05**	2.9	6.3	4.8	**0.4**	2.0	1.0	2.4	**0.1**
MBSA1	1	22-Jul-05												**0.25**	**0.16**
MBSA1-0	1	14-Jul-08	0.0381	**0.01395**	**0.01325**	**0.4**	**0.05**	**0.05**	**0.05**	**0.05**	1.2	**0.05**	**0.05**	1.6	**0.1**
MOPP1	1	31-Aug-04													
MOPP11	1	18-Jul-08	0.0099	**0.0135**	**0.01285**	**0.35**	**0.05**	1.6	2.3	1.8	**0.35**	0.7	**0.05**	1.2	**0.1**
MOPP12	2	18-Jul-08	0.0120	**0.0135**	**0.01285**	**0.35**	**0.05**	1.2	2.2	2.8	**0.35**	**0.05**	0.7	1.2	**0.1**
MOPP13	3	18-Jul-08	0.0133	**0.01485**	**0.01415**	1.0	**0.05**	2.5	4.7	4.1	**0.4**	1.1	0.8	1.8	**0.1**
MOPP14	4	18-Jul-08	0.0140	**0.01915**	**0.01825**	**0.55**	**0.05**	2.8	5.0	4.1	**0.55**	1.8	0.9	1.9	**0.15**
MOPP15	5	18-Jul-08	0.0130	**0.01495**	**0.0142**	1.1	1.1	2.5	4.6	3.7	**0.4**	1.3	0.8	2.3	**0.1**
		Minimum	0.0099	0.0135	0.0129	0.4	0.1	1.2	2.2	1.8	0.4	0.1	0.1	1.2	0.1
		Maximum	0.0140	0.0192	0.0183	1.1	1.1	2.8	5.0	4.1	0.6	1.8	0.9	2.3	0.2
		Median	0.0130	0.0149	0.0142	0.6	0.1	2.5	4.6	3.7	0.4	1.1	0.8	1.8	0.1
MPS11	2	28-Aug-04													
MPS11	1	28-Aug-04													
MPS11	1	29-Aug-04													
MPS12	2	28-Aug-04													
MPS13	3	29-Aug-04													
MPS14	4	29-Aug-04													
MPS15	5	29-Aug-04													
MPS1	1	14-Jul-08	0.0569	0.0413	**0.01825**	**0.55**	**0.05**	**0.05**	1.1	1.5	**0.55**	**0.05**	**0.05**	3.8	**0.15**
MPS1	2	14-Jul-08	0.0823	0.0515	**0.01915**	**0.55**	**0.05**	**0.05**	1.3	2.1	**0.55**	**0.05**	**0.05**	4.6	**0.15**
MPS1	3	14-Jul-08	0.0592	0.0359	**0.0168**	**0.5**	**0.05**	**0.05**	1.4	1.5	**0.5**	**0.05**	**0.05**	4.0	**0.15**
MPS1	4	14-Jul-08	0.0571	0.0416	**0.0190**	**0.55**	**0.05**	**0.05**	1.6	1.8	**0.55**	**0.05**	**0.05**	3.9	**0.15**
MPS1	5	14-Jul-08	0.0669	0.0423	**0.0165**	**0.5**	**0.05**	**0.05**	1.2	1.7	**0.5**	**0.05**	**0.05**	4.4	**0.15**
		Minimum	0.0569	0.0359	0.0165	0.5	0.1	0.1	1.1	1.5	0.5	0.05	0.05	3.8	0.2
		Maximum	0.0823	0.0515	0.0192	0.6	0.1	0.1	1.6	2.1	0.6	0.05	0.05	4.6	0.2
		Median	0.0592	0.0416	0.0183	0.6	0.1	0.1	1.3	1.7	0.6	0.05	0.05	4.0	0.2
MPS1	9	14-Jul-08	0.0838	0.0610	**0.0162**	**0.45**	**0.05**	**0.05**	1.5	2.2	**0.45**	**0.05**	**0.05**	5.1	**0.15**

Location ID	Replicate Number	Sample Date	Dibenzofuran	Dibenzo-thiophene	Diesel Range Organics	Ethylbenzene	Fluoranthene	Fluorene	Gasoline Range Organics	Indeno (1,2,3-cd) pyrene	Naphthalene	Naphthalene, 1,6,7-trimethyl-	o-Xylene	PAHs, Total	Perylene	Phen-anthrene
			µg/kg	µg/kg	mg/kg	mg/kg	µg/kg	µg/kg	mg/kg	µg/kg	µg/kg	µg/kg	mg/kg	µg/kg	µg/kg	µg/kg
MBB	1	21-Jul-05	0.40		6.6	**0.007**	**0.235**	**0.13**	**0.55**	**0.165**	**1.75**		**0.0055**			1.3
MBB-0	1	18-Jul-08		1.3			4.3	1.8		**0.35**	10.0	2.9		206.3	29.3	10.7
MBB-8	1	18-Jul-08		0.8			3.5	0.9		**0.25**	5.2	1.5		115.1	18.6	5.3
MBSA1	1	22-Jul-05	**0.105**		**1.7**	**0.006**	**0.21**	**0.115**	**0.475**	**0.145**	**1.55**		**0.00475**			0.46
MBSA1-0	1	14-Jul-08		0.3			2.0	0.5		**0.25**	2.9	0.7		41.0	10.6	3.4
MOPP1	1	31-Aug-04			**9.3**	**0.00107**			0.258				**0.00107**			
MOPP11	1	18-Jul-08		0.3			0.8	0.5		**0.2**	2.9	0.6		53.4	7.6	2.7
MOPP12	2	18-Jul-08		0.4			1.1	0.3		**0.2**	2.8	0.5		57.3	8.8	3.1
MOPP13	3	18-Jul-08		0.5			1.3	0.7		**0.25**	8.5	1.1		87.9	12.9	4.2
MOPP14	4	18-Jul-08		0.5			1.3	0.8		**0.3**	3.8	1.2		87.6	14.0	4.5
MOPP15	5	18-Jul-08		0.5			1.5	0.8		**0.25**	3.5	1.1		84.9	13.7	4.3
		Minimum		0.3			0.8	0.3		0.2	2.8	0.5		53.4	7.6	2.7
		Maximum		0.5			1.5	0.8		0.3	8.5	1.2		87.9	14.0	4.5
		Median		0.5			1.3	0.7		0.3	3.5	1.1		84.9	12.9	4.2
MPS11	2	28-Aug-04			**11.4**											
MPS11	1	28-Aug-04			9.01	**0.00112**			0.227				**0.00112**			
MPS11	1	29-Aug-04														
MPS12	2	28-Aug-04			**9.7**	**0.00139**			0.705				**0.00139**			
MPS13	3	29-Aug-04			24.1	**0.00126**			**0.62**				**0.00126**			
MPS14	4	29-Aug-04			**10.05**	**0.001315**			**0.66**				**0.001315**			
MPS15	5	29-Aug-04			**10.75**	**0.00132**			**0.4225**				**0.00132**			
MPS1	1	14-Jul-08		0.9			2.9	1.5		**0.3**	6.4	2.3		99.1	26.7	9.0
MPS1	2	14-Jul-08		1.3			3.9	2.0		**0.35**	9.3	2.9		125.6	31.8	11.5
MPS1	3	14-Jul-08		1.0			2.8	1.5		0.6	6.9	2.0		104.0	30.1	8.9
MPS1	4	14-Jul-08		1.0			2.9	1.6		**0.35**	7.1	1.9		104.9	28.0	9.6
MPS1	5	14-Jul-08		1.1			3.4	1.7		**0.3**	7.5	2.3		111.9	29.2	10.4
		Minimum		0.9			2.8	1.5		0.3	6.4	1.9		99.1	26.7	8.9
		Maximum		1.3			3.9	2.0		0.6	9.3	2.9		125.6	31.8	11.5
		Median		1.0			2.9	1.6		0.4	7.1	2.3		104.9	29.2	9.6
MPS1	9	14-Jul-08		1.2			3.6	2.0		**0.3**	8.2	3.0		134.2	40.8	11.8

Location ID	Replicate Number	Sample Date	Phytane	Pristane	Pyrene	Residual Range Organics	Toluene	Total Alkanes	Total NS&T PAHs	Total Organic Carbon (TOC)	Total PAHs without Perylene	Total Resolved	Total TPH	Total UCM	Xylene, Isomers m & p
			µg/g	µg/g	µg/kg	mg/kg	mg/kg	µg/g	µg/kg	percent	µg/kg	µg/g	µg/g	µg/g	mg/kg
MBB	1	21-Jul-05			**0.25**	**48.5**	**0.007**			0.27					**0.013**
MBB-0	1	18-Jul-08	**0.0063**	0.0402	2.7			1.9862	106.8	0.48	177.0	5.57	15.51	9.94	
MBB-8	1	18-Jul-08	**0.00405**	**0.0113**	1.9			0.8118	58.6	0.30	96.5	3.46	8.79	5.33	
MBSA1	1	22-Jul-05			**0.22**	**46.5**	**0.006**			0.16					**0.0115**
MBSA1-0	1	14-Jul-08	**0.0038**	**0.01065**	1.9			1.3255	34.0	0.33	30.5	4.76	9.48	4.72	
MOPP1	1	31-Aug-04				**9.3**	**0.002055**			0.241					**0.002055**
MOPP11	1	18-Jul-08	**0.0037**	**0.0103**	0.7			0.4127	25.1	0.15	45.7	1.21	3.07	1.86	
MOPP12	2	18-Jul-08	**0.0037**	**0.0103**	1.1			0.4272	27.8	0.18	48.5	1.21	3.13	1.92	
MOPP13	3	18-Jul-08	**0.0041**	**0.01135**	1.5			0.6213	45.7	0.21	75.0	1.55	4.49	2.94	
MOPP14	4	18-Jul-08	**0.00525**	**0.01465**	1.5			0.5709	43.1	0.16	73.6	1.59	4.09	2.51	
MOPP15	5	18-Jul-08	**0.0041**	**0.0114**	1.8			0.6624	42.2	0.19	71.2	1.65	3.94	2.29	
		Minimum	0.0037	0.0103	0.7			0.4127	25.1	0.15	45.70	1.21	3.07	1.86	
		Maximum	0.0053	0.0147	1.8			0.6624	45.7	0.15	75.00	1.65	4.49	2.94	
		Median	0.0041	0.0114	1.5			0.5709	42.2	0.15	71.20	1.55	3.94	2.29	
MPS11	2	28-Aug-04				**11.4**				0.618					
MPS11	1	28-Aug-04				103	**0.002155**			0.623					**0.002155**
MPS11	1	29-Aug-04								0.423					
MPS12	2	28-Aug-04				20.8	**0.002675**			0.576					**0.002675**
MPS13	3	29-Aug-04				34	**0.002425**			0.55					**0.002425**
MPS14	4	29-Aug-04				33.9	**0.00253**			0.568					**0.00253**
MPS15	5	29-Aug-04				25.9	**0.002535**			0.996					**0.002535**
MPS1	1	14-Jul-08	**0.00525**	**0.01465**	3.1			1.8092	85.5	0.78	72.4	5.34	12.09	6.75	
MPS1	2	14-Jul-08	**0.0055**	0.0332	4.0			2.3967	105.7	0.64	93.8	7.89	17.07	9.18	
MPS1	3	14-Jul-08	**0.00485**	0.0296	3.0			1.8820	88.3	0.74	73.9	5.88	12.42	6.54	
MPS1	4	14-Jul-08	**0.0055**	**0.01525**	3.3			1.8604	89.1	0.66	76.9	5.50	12.06	6.55	
MPS1	5	14-Jul-08	**0.00475**	**0.01325**	3.7			1.9551	94.6	0.76	82.8	6.23	13.65	7.42	
		Minimum	0.0048	0.0133	3.0	20.8	0.00243	1.8092	85.5	0.55	72.4	5.34	12.06	6.54	0.00243
		Maximum	0.0055	0.0332	4.0	34.0	0.00268	2.3967	105.7	1.00	93.8	7.89	17.07	9.18	0.00268
		Median	0.0053	0.0153	3.3	29.9	0.00253	1.8820	89.1	0.66	76.9	5.88	12.42	6.75	0.00253
MPS1	9	14-Jul-08	**0.0047**	**0.0130**	4.0			2.4888	113.7	0.64	93.4	6.10	13.87	7.77	

Location ID	Replicate Number	Sample Date	1-Methyl-naphthalene	1-Methyl-phenanthrene	2,6-Dimethyl-naphthalene	2-Methyl-naphthalene	Ace-naphthene	Ace-naphthylene	Anthracene	Benzene	Benzo(a) anthracene	Benzo(a)-pyrene	Benzo(b)-fluoranthene	Benzo(e)-pyrene
			µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	mg/kg	µg/kg	µg/kg	µg/kg	µg/kg
MPS1L	1	29-Aug-04								0.00051				
MPS1M	1	29-Aug-04								0.000515				
MPS1A	1	21-Jul-05				0.215	0.105	0.14	0.14	0.007	0.105	0.14	0.305	
MPS2		31-Aug-04												
MPS21	1	27-Aug-04								0.002135				
MPS22	2	27-Aug-04								0.00219				
MPS22		28-Aug-04												
MPS23	3	28-Aug-04								0.00071				
MPS24	4	28-Aug-04								0.000675				
MPS25	5	28-Aug-04								0.000685				
		Minimum								0.000675				
		Maximum								0.00219				
		Median								0.00071				
MPS2L	1	27-Aug-04								0.000725				
MPS2	1	19-Jul-05				2.5	0.125	0.17	0.17	0.0085	0.29	0.17	0.88	
MPS2-0	1	18-Jul-08	6.3	4.5	10.1	8.9	0.05	0.6	1.1		2.0	2.0	3.5	3.9
		Minimum												
		Maximum												
		Median												
MPS2M	1	27-Aug-04								0.00055				
MPS3M	1	31-Aug-04								0.000595				
MPS3	1	22-Jul-05				2.6	0.14	0.19	0.19	0.0105	0.14	0.19	0.41	
MPS3-0	1	14-Jul-08	3.1	1.8	5.1	4.3	0.05	0.05	0.05		0.2	0.35	1.0	1.0
		Minimum												
		Maximum												
		Median												
MPS3L	1	31-Aug-04								0.000705				
MPS3-0	1	17-Jul-08	8.3	8.2	12.0	11.8	0.05	0.6	1.2		1.6	1.5	3.6	3.4
MPS3-8	1	17-Jul-08	6.8	10.9	7.7	9.3	0.05	0.5	1.0		1.3	0.9	2.6	2.4

Location ID	Replicate Number	Sample Date	Benzo(g,h,i)-perylene	Benzo(k)-fluoranthene	Biphenyl	C1 - Naphthalenes	C10 as n-Decane	C11 as n-Undecane	C12 as n-Dodecane	C13 as n-Tridecane	C14 as n-Tetradecane	C15 as n-Pentadecane	C16 as n-Hexadecane	C17 as n-Heptadecane
			µg/kg	µg/kg	µg/kg	µg/kg	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g
MPS1L	1	29-Aug-04												
MPS1M	1	29-Aug-04												
MPS1A	1	21-Jul-05	**0.145**	**0.21**										
MPS2		31-Aug-04												
MPS21	1	27-Aug-04												
MPS22	2	27-Aug-04												
MPS22		28-Aug-04												
MPS23	3	28-Aug-04												
MPS24	4	28-Aug-04												
MPS25	5	28-Aug-04												
		Minimum												
		Maximum												
		Median												
MPS2L	1	27-Aug-04												
MPS2	1	19-Jul-05	**0.59**	**0.255**										
MPS2-0	1	18-Jul-08	2.1	1.0	3.9	15.2	0.1062	0.0323	0.0332	0.0368	0.0426	0.0547	**0.0266**	0.4152
		Minimum												
		Maximum												
		Median												
MPS2M	1	27-Aug-04												
MPS3M	1	31-Aug-04												
MPS3	1	22-Jul-05	**0.20**	**0.285**										
MPS3-0	1	14-Jul-08	**0.25**	0.9	1.9	7.4	0.0202	0.0141	0.0251	0.0266	0.0221	**0.01545**	**0.02235**	0.0570
		Minimum												
		Maximum												
		Median												
MPS3L	1	31-Aug-04												
MPS3-0	1	17-Jul-08	2.4	1.0	5.7	20.0	0.0219	0.0402	0.0485	0.0502	0.0515	0.0543	**0.02975**	0.1576
MPS3-8	1	17-Jul-08	2.1	0.7	3.8	16.1	0.0253	0.0266	0.0340	0.0391	0.0263	**0.01445**	**0.0209**	0.0756

Location ID	Replicate Number	Sample Date	C18 as n-Octadecane	C19 as n-Nonadecane	C1-Chrysenes	C1-Dibenzo-thiophenes	C1-Fluoranthenes/ Pyrenes	C1-Fluorenes	C1-Phenanthrenes/ Anthracenes	C2 - Fluoranthenes/ Pyrenes	C20 as n-Eicosane	C21 as n-Henei-cosane	C22 as n-Do-cosane	C23 as n-Tri-cosane	C24 as n-Tetra-cosane
			µg/g	µg/g	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/g	µg/g	µg/g	µg/g	µg/g
MPS1L	1	29-Aug-04													
MPS1M	1	29-Aug-04													
MPS1A	1	21-Jul-05													
MPS2		31-Aug-04													
MPS21	1	27-Aug-04													
MPS22	2	27-Aug-04													
MPS22		28-Aug-04													
MPS23	3	28-Aug-04													
MPS24	4	28-Aug-04													
MPS25	5	28-Aug-04													
		Minimum													
		Maximum													
		Median													
MPS2L	1	27-Aug-04													
MPS2	1	19-Jul-05													
MPS2-0	1	18-Jul-08	**0.0262**	0.0621	8.1	2.0	2.9	3.5	21.3	2.2	0.0724	0.0591	0.0518	0.1202	0.0534
		Minimum													
		Maximum													
		Median													
MPS2M	1	27-Aug-04													
MPS3M	1	31-Aug-04													
MPS3	1	22-Jul-05													
MPS3-0	1	14-Jul-08	**0.02205**	**0.0141**	**0.45**	**0.05**	**0.75**	**0.05**	1.7	**0.75**	**0.0166**	0.0643	0.0294	0.1107	0.0628
		Minimum													
		Maximum													
		Median													
MPS3L	1	31-Aug-04													
MPS3-0	1	17-Jul-08	**0.0293**	0.0569	6.9	2.6	3.5	4.6	16.3	2.6	**0.0221**	0.0805	0.0467	0.1454	0.0675
MPS3-8	1	17-Jul-08	**0.0206**	0.0312	5.9	2.6	2.7	3.6	16.8	2.0	**0.01555**	0.0571	0.0381	0.1090	0.0532

Location ID	Replicate Number	Sample Date	C25 as n-Penta-cosane	C26 as n-Hexa-cosane	C27 as n-Hepta-cosane	C28 as n-Octa-cosane	C29 as n-Nona-cosane	C2-Chrysenes	C2-Dibenzo-thiophenes	C2-Fluorenes	C2-Naphthalenes	C3 - Fluoranthenes / Pyrenes	C30 as n-Tri-acontane	C31 as n-Hentri-acontane	C32 as n-Dotri-acontane
			µg/g	µg/g	µg/g	µg/g	µg/g	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/g	µg/g	µg/g
MPS1L	1	29-Aug-04													
MPS1M	1	29-Aug-04													
MPS1A	1	21-Jul-05													
MPS2		31-Aug-04													
MPS21	1	27-Aug-04													
MPS22	2	27-Aug-04													
MPS22		28-Aug-04													
MPS23	3	28-Aug-04													
MPS24	4	28-Aug-04													
MPS25	5	28-Aug-04													
		Minimum													
		Maximum													
		Median													
MPS2L	1	27-Aug-04													
MPS2	1	19-Jul-05													
MPS2-0	1	18-Jul-08	0.1981	0.0587	0.4978	0.0496	0.2991	7.7	1.9	10.4	18.1	**0.85**	0.0447	0.2294	**0.01645**
		Minimum													
		Maximum													
		Median													
MPS2M	1	27-Aug-04													
MPS3M	1	31-Aug-04													
MPS3	1	22-Jul-05													
MPS3-0	1	14-Jul-08	0.3077	0.0779	1.3641	0.1000	0.4934	**0.45**	**0.05**	**0.05**	1.4	**0.75**	0.0558	0.5009	0.0407
		Minimum													
		Maximum													
		Median													
MPS3L	1	31-Aug-04													
MPS3-0	1	17-Jul-08	0.2753	0.0758	0.8560	0.0616	0.4181	6.6	2.6	**0.05**	20.1	**0.95**	0.0480	0.3473	**0.0184**
MPS3-8	1	17-Jul-08	0.2030	0.0533	0.6492	0.0481	0.3317	5.2	2.3	**0.05**	17.5	**0.7**	0.0433	0.3001	0.0279

Location ID	Replicate Number	Sample Date	C33 as n-Tritri-acontane	C34 as n-Tetratri-acontane	C35 as n-Pentatri-acontane	C3-Chrysenes	C3-Dibenzo-thiophenes	C3-Fluorenes	C3-Naphthalenes	C3-Phenanthrenes/ Anthracenes	C4-Chrysenes	C4-Naphthalenes	C4-Phenanthrenes/ Anthracenes	Chrysene	Dibenzo(a,h) anthracene
			µg/g	µg/g	µg/g	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg
MPS1L	1	29-Aug-04													
MPS1M	1	29-Aug-04													
MPS1A	1	21-Jul-05												**0.26**	**0.165**
MPS2		31-Aug-04													
MPS21	1	27-Aug-04													
MPS22	2	27-Aug-04													
MPS22		28-Aug-04													
MPS23	3	28-Aug-04													
MPS24	4	28-Aug-04													
MPS25	5	28-Aug-04													
		Minimum													
		Maximum													
		Median													
MPS2L	1	27-Aug-04													
MPS2	1	19-Jul-05												**0.94**	**0.205**
MPS2-0	1	18-Jul-08	0.0698	0.0543	**0.01925**	4.4	**0.05**	4.3	10.9	8.0	**0.55**	2.4	2.1	6.4	0.5
		Minimum													
		Maximum													
		Median													
MPS2M	1	27-Aug-04													
MPS3M	1	31-Aug-04													
MPS3	1	22-Jul-05												**0.35**	**0.225**
MPS3-0	1	14-Jul-08	0.1822	**0.0170**	**0.0162**	**0.45**	**0.05**	**0.05**	1.1	0.8	**0.45**	**0.05**	**0.05**	1.8	**0.15**
		Minimum													
		Maximum													
		Median													
MPS3L	1	31-Aug-04													
MPS3-0	1	17-Jul-08	0.1261	0.0609	**0.02155**	4.3	**0.05**	**0.05**	13.8	9.8	**0.65**	3.5	2.6	5.3	0.4
MPS3-8	1	17-Jul-08	0.1192	0.0451	**0.01515**	2.0	**0.05**	**0.05**	14.6	8.5	1.7	2.7	2.5	4.7	0.5

Location ID	Replicate Number	Sample Date	Dibenzofuran	Dibenzo-thiophene	Diesel Range Organics	Ethylbenzene	Fluoranthene	Fluorene	Gasoline Range Organics	Indeno (1,2,3-cd) pyrene	Naphthalene	Naphthalene, 1,6,7-trimethyl-	o-Xylene	PAHs, Total	Perylene	Phen-anthrene
			µg/kg	µg/kg	mg/kg	mg/kg	µg/kg	µg/kg	mg/kg	µg/kg	µg/kg	µg/kg	mg/kg	µg/kg	µg/kg	µg/kg
MPS1L	1	29-Aug-04			8.95	0.001025			0.215				0.001025			
MPS1M	1	29-Aug-04			9.9	0.00103			0.43				0.00103			
MPS1A	1	21-Jul-05	0.11		1.8	0.0065	0.215	0.12	0.49	0.155	1.6		0.00495			0.21
MPS2		31-Aug-04														
MPS21	1	27-Aug-04			18.4	0.0041			0.655				0.0041			
MPS22	2	27-Aug-04			11.6	0.004215			0.665				0.004215			
MPS22		28-Aug-04														
MPS23	3	28-Aug-04			10.2	0.00142			0.735				0.00142			
MPS24	4	28-Aug-04			20.3	0.001345			0.635				0.001345			
MPS25	5	28-Aug-04			9.1	0.00137			0.317				0.00137			
		Minimum			9.1	0.001345			0.317				0.001345			
		Maximum			20.3	0.004215			0.735				0.004215			
		Median			11.6	0.001420			0.655				0.001420			
MPS2L	1	27-Aug-04			9.1	0.001455			0.64				0.001455			
MPS2	1	19-Jul-05	0.79		24	0.008	0.87	0.49	6.5	0.185	1.95		0.0065			3.4
MPS2-0	1	18-Jul-08		1.2			5.0	1.7		1.3	9.4	2.3		233.5	32.7	10.8
		Minimum														
		Maximum														
		Median														
MPS2M	1	27-Aug-04			14	0.001095			0.3515				0.001095			
MPS3M	1	31-Aug-04			9.3	0.00119			0.314				0.00119			
MPS3	1	22-Jul-05	0.75		36	0.0095	0.60	0.43	0.7	0.205	2.15		0.008			2.4
MPS3-0	1	14-Jul-08		0.6			1.3	0.9		0.3	4.7	1.1		70.0	31.0	4.6
		Minimum														
		Maximum														
		Median														
MPS3L	1	31-Aug-04			43.4	0.001405			0.502				0.001405			
MPS3-0	1	17-Jul-08		1.5			5.0	3.1		1.1	12.0	3.4		246.0	42.2	13.6
MPS3-8	1	17-Jul-08		1.4			4.9	2.2		1.5	8.7	2.7		217.7	46.7	10.5

Location ID	Replicate Number	Sample Date	Phytane	Pristane	Pyrene	Residual Range Organics	Toluene	Total Alkanes	Total NS&T PAHs	Total Organic Carbon (TOC)	Total PAHs without Perylene	Total Resolved	Total TPH	Total UCM	Xylene, Isomers m & p
			µg/g	µg/g	µg/kg	mg/kg	mg/kg	µg/g	µg/kg	percent	µg/kg	µg/g	µg/g	µg/g	mg/kg
MPS1L	1	29-Aug-04				**8.95**	**0.001965**			0.135					**0.001965**
MPS1M	1	29-Aug-04				**9.9**	**0.001985**			0.109					**0.001985**
MPS1A	1	21-Jul-05			**0.23**	**48**	**0.0065**			0.66					**0.012**
MPS2		31-Aug-04								0.578					
MPS21	1	27-Aug-04				30.9	**0.0082**								**0.0082**
MPS22	2	27-Aug-04				19.1	**0.00845**								**0.00845**
MPS22		28-Aug-04								0.812					
MPS23	3	28-Aug-04				29.3	**0.00273**			0.564					**0.00273**
MPS24	4	28-Aug-04				33.2	**0.00259**			0.431					**0.00259**
MPS25	5	28-Aug-04				32.9	**0.002635**			0.498					**0.002635**
		Minimum				19.1	0.002590			0.431					0.00259
		Maximum				33.2	0.008450			0.812					0.00845
		Median				30.9	0.002730			0.564					0.00273
MPS2L	1	27-Aug-04				**9.1**	**0.002795**			0.735					**0.002795**
MPS2	1	19-Jul-05			**0.83**	**60**	**0.008**			0.58					**0.0145**
MPS2-0	1	18-Jul-08	**0.00555**	0.0326	4.4			2.7721	114.2	0.97	200.7	9.56	24.27	14.71	
		Minimum								0.58					
		Maximum								0.97					
		Median								0.735					
MPS2M	1	27-Aug-04				**14**	**0.00211**			0.376					**0.00211**
MPS3M	1	31-Aug-04				32.2	**0.00229**			0.507					**0.00229**
MPS3	1	22-Jul-05			**0.65**	**60**	**0.0095**			0.88					**0.018**
MPS3-0	1	14-Jul-08	**0.00465**	**0.0130**	1.5			3.6856	64.2	1.21	39.0	12.06	18.46	6.41	
		Minimum								0.507					
		Maximum								1.21					
		Median								0.88					
MPS3L	1	31-Aug-04				142	**0.002705**			1.28					**0.002705**
MPS3-0	1	17-Jul-08	**0.0062**	**0.0173**	4.5			3.2774	140.6	0.81	203.7	9.52	28.39	18.87	
MPS3-8	1	17-Jul-08	**0.00435**	**0.01215**	3.5			2.4848	126.3	0.69	171.0	6.48	21.95	15.47	

Location ID	Replicate Number	Sample Date	1-Methyl-naphthalene	1-Methyl-phenanthrene	2,6-Dimethyl-naphthalene	2-Methyl-naphthalene	Ace-naphthene	Ace-naphthylene	Anthracene	Benzene	Benzo(a) anthracene	Benzo(a)-pyrene	Benzo(b)-fluoranthene	Benzo(e)-pyrene
			µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	mg/kg	µg/kg	µg/kg	µg/kg	µg/kg
MPS41	1	29-Aug-04								**0.001945**				
MPS41	1	30-Aug-04												
MPS41	2	30-Aug-04												
MPS42	2	29-Aug-04								**0.00072**				
MPS43	3	29-Aug-04								**0.000655**				
MPS44	4	30-Aug-04								**0.000575**				
MPS45	5	30-Aug-04								**0.0006**				
MPS4	1	12-Jul-08	5.1	3.0	5.1	6.7	**0.05**	**0.05**	0.4		0.8	1.1	2.0	2.0
MPS4	2	12-Jul-08	3.0	1.9	3.7	3.8	**0.05**	**0.05**	**0.05**		0.6	**0.3**	1.2	1.3
MPS4	3	12-Jul-08	4.4	2.6	3.8	5.5	**0.05**	**0.05**	**0.05**		0.6	**0.35**	1.2	1.3
MPS4	4	12-Jul-08	2.6	1.8	3.5	3.4	**0.05**	**0.05**	**0.05**		0.4	**0.3**	1.0	1.0
MPS4	5	12-Jul-08	5.4	3.2	5.7	7.1	**0.05**	**0.05**	0.4		0.6	**0.3**	1.7	1.6
		Minimum	2.6	1.8	3.5	3.4	0.05	0.05	0.05	0.000575	0.4	0.3	1.0	1.0
		Maximum	5.4	3.2	5.7	7.1	0.05	0.05	0.4	0.00072	0.8	1.1	2.0	2.0
		Median	4.4	2.6	3.8	5.5	0.05	0.05	0.05	0.00063	0.6	0.3	1.2	1.3
MPS4L	1	30-Aug-04								**0.000665**				
MPS4	1	22-Jul-05				**1.5**	**0.125**	**0.17**	**0.17**	**0.0085**	**0.125**	**0.17**	**0.37**	
MPS4M	1	30-Aug-04								**0.00058**				
MPS4-0	1	14-Jul-08	1.3	0.4	0.6	1.8	**0.05**	**0.05**	**0.05**		**0.1**	**0.2**	**0.15**	**0.15**
MPSE	1	31-Aug-04								**0.001915**				
MPSEM	1	31-Aug-04												
MPSEU	1	22-Jul-05				**2.3**	**0.13**	**0.18**	**0.18**	**0.0085**	**0.29**	**0.18**	**0.39**	
MPSE	1	14-Jul-08	5.1	3.8	6.4	7.2	**0.05**	0.6	0.9		1.9	1.4	3.0	2.6
		Minimum												
		Maximum												
		Median												
MWGI	1	30-Aug-04												

Notes:

Bold Results = Parameter undetected by test, value shown is 1/2 MDL or 1/2 MRL.
If result was not detected at the lab MDL, the value shown is 1/2 MDL.
If result was validation flagged U or UJ, the value shown is 1/2 MRL.
Green Results = Estimated result reported by laboratory below reporting limit (MRL).
MDL = Method Detection Limit.
MRL = Method Reporting Limit.
NA = Not Applicable.

NS & T - National Status and Trends Mussel Watch
PAHs - polynuclear aromtaic hydrocarbons
TPH = total petroleum hydrocarbons
UCM = unresolved complex mixture
All results reported on dry weight basis.

Location ID	Replicate Number	Sample Date	Benzo(g,h,i)-perylene	Benzo(k)-fluoranthene	Biphenyl	C1 - Naphthalenes	C10 as n-Decane	C11 as n-Undecane	C12 as n-Dodecane	C13 as n-Tridecane	C14 as n-Tetradecane	C15 as n-Pentadecane	C16 as n-Hexadecane	C17 as n-Heptadecane
			µg/kg	µg/kg	µg/kg	µg/kg	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g
MPS41	1	29-Aug-04												
MPS41	1	30-Aug-04												
MPS41	2	30-Aug-04												
MPS42	2	29-Aug-04												
MPS43	3	29-Aug-04												
MPS44	4	30-Aug-04												
MPS45	5	30-Aug-04												
MPS4	1	12-Jul-08	1.7	0.6	1.8	11.8	0.0082	0.0233	0.0256	0.0249	0.0206	**0.01405**	**0.02035**	0.0706
MPS4	2	12-Jul-08	1.2	**0.2**	1.6	6.8	**0.00345**	0.0169	0.0239	0.0237	0.0214	**0.0143**	**0.0207**	**0.01495**
MPS4	3	12-Jul-08	0.8	**0.2**	1.5	9.9	0.0547	0.0187	**0.01305**	0.0248	0.0217	**0.0169**	**0.02445**	0.0538
MPS4	4	12-Jul-08	0.8	**0.15**	1.1	6.1	0.0389	0.0165	**0.01005**	0.0181	0.0186	**0.0130**	**0.01885**	0.0282
MPS4	5	12-Jul-08	1.4	1.6	2.2	12.5	0.0275	0.0222	0.0262	0.0259	0.0249	**0.01475**	**0.0213**	0.0758
		Minimum	0.8	0.2	1.1	6.1	0.00345	0.01650	0.01005	0.01810	0.01860	0.01300	0.01885	0.01495
		Maximum	1.7	1.6	2.2	12.5	0.05470	0.02330	0.02620	0.02590	0.02490	0.01690	0.02445	0.07580
		Median	1.2	0.2	1.6	9.9	0.02750	0.01870	0.02390	0.02480	0.02140	0.01430	0.02070	0.05380
MPS4L	1	30-Aug-04												
MPS4	1	22-Jul-05	**0.18**	**0.255**										
MPS4M	1	30-Aug-04												
MPS4-0	1	14-Jul-08	**0.15**	**0.1**	0.3	3.1	**0.0023**	**0.00425**	**0.00745**	0.0090	0.0085	**0.00965**	**0.0140**	**0.0101**
MPSE	1	31-Aug-04												
MPSEM	1	31-Aug-04												
MPSEU	1	22-Jul-05	**0.39**	**0.265**										
MPSE	1	14-Jul-08	1.4	2.9	2.4	12.3	0.0094	0.0212	0.0270	0.0266	0.0279	0.0322	**0.0212**	0.0899
		Minimum												
		Maximum												
		Median												
MWGI	1	30-Aug-04												

Location ID	Replicate Number	Sample Date	C18 as n-Octadecane	C19 as n-Nonadecane	C1-Chrysenes	C1-Dibenzo-thiophenes	C1-Fluoranthenes/ Pyrenes	C1-Fluorenes	C1-Phenanthrenes/ Anthracenes	C2 - Fluoranthenes/ Pyrenes	C20 as n-Eicosane	C21 as n-Henei-cosane	C22 as n-Do-cosane	C23 as n-Tri-cosane	C24 as n-Tetra-cosane
			µg/g	µg/g	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/g	µg/g	µg/g	µg/g	µg/g
MPS41	1	29-Aug-04													
MPS41	1	30-Aug-04													
MPS41	2	30-Aug-04													
MPS42	2	29-Aug-04													
MPS43	3	29-Aug-04													
MPS44	4	30-Aug-04													
MPS45	5	30-Aug-04													
MPS4	1	12-Jul-08	**0.0201**	0.0389	4.1	1.3	2.3	2.1	9.2	2.5	**0.01515**	0.0385	0.0270	0.0712	0.0413
MPS4	2	12-Jul-08	**0.0204**	**0.01305**	3.0	0.8	1.4	1.2	6.1	1.4	**0.0154**	**0.01535**	**0.01125**	0.0440	0.0319
MPS4	3	12-Jul-08	**0.0241**	0.0315	3.3	1.0	1.8	1.9	7.3	**0.8**	**0.0182**	**0.01815**	**0.0133**	0.0466	**0.0177**
MPS4	4	12-Jul-08	**0.01855**	0.0260	2.6	0.8	1.3	1.3	5.4	**0.6**	**0.0140**	**0.01395**	**0.01025**	0.0342	**0.01365**
MPS4	5	12-Jul-08	**0.0210**	0.0414	1.5	0.5	**0.7**	1.1	2.9	**0.7**	**0.01585**	0.0471	0.0339	0.0818	0.0486
		Minimum	0.01855	0.01305	1.5	0.5	0.7	1.1	2.9	0.6	0.0140	0.0140	0.0103	0.0342	0.01365
		Maximum	0.02410	0.04140	4.1	1.3	2.3	2.1	9.2	2.5	0.0182	0.0471	0.0339	0.0818	0.0486
		Median	0.02040	0.03150	3.0	0.8	1.4	1.3	6.1	0.8	0.0154	0.0182	0.0133	0.0466	0.0319
MPS4L	1	30-Aug-04													
MPS4	1	22-Jul-05													
MPS4M	1	30-Aug-04													
MPS4-0	1	14-Jul-08	**0.0138**	**0.00885**	**0.3**	**0.05**	**0.45**	**0.05**	**0.05**	**0.45**	**0.0104**	**0.01035**	**0.0076**	**0.0060**	**0.01015**
MPSE	1	31-Aug-04													
MPSEM	1	31-Aug-04													
MPSEU	1	22-Jul-05													
MPSE	1	14-Jul-08	**0.0209**	0.0372	1.9	0.7	**0.7**	1.3	3.4	**0.7**	0.0584	0.0764	0.0356	0.1174	0.0603
		Minimum													
		Maximum													
		Median													
MWGI	1	30-Aug-04													

Location ID	Replicate Number	Sample Date	C25 as n-Penta-cosane	C26 as n-Hexa-cosane	C27 as n-Hepta-cosane	C28 as n-Octa-cosane	C29 as n-Nona-cosane	C2-Chrysenes	C2-Dibenzo-thiophenes	C2-Fluorenes	C2-Naphthalenes	C3 - Fluoranthenes / Pyrenes	C30 as n-Tri-acontane	C31 as n-Hentri-acontane	C32 as n-Dotri-acontane
			µg/g	µg/g	µg/g	µg/g	µg/g	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/g	µg/g	µg/g
MPS41	1	29-Aug-04													
MPS41	1	30-Aug-04													
MPS41	2	30-Aug-04													
MPS42	2	29-Aug-04													
MPS43	3	29-Aug-04													
MPS44	4	30-Aug-04													
MPS45	5	30-Aug-04													
MPS4	1	12-Jul-08	0.1525	0.0400	0.6054	0.0375	0.2647	4.2	1.3	3.3	11.2	**0.65**	0.0412	0.2103	0.0277
MPS4	2	12-Jul-08	0.0768	0.0254	0.2190	0.0287	0.1333	3.0	0.9	2.6	7.5	**0.7**	0.0467	0.1151	**0.0128**
MPS4	3	12-Jul-08	0.0803	0.0276	0.2250	0.0303	0.1506	3.7	1.0	3.4	8.8	**0.8**	0.0553	0.1280	**0.0151**
MPS4	4	12-Jul-08	0.0651	0.0207	0.1709	**0.01085**	0.1142	2.5	0.8	2.6	6.4	**0.6**	0.0313	0.0995	**0.01165**
MPS4	5	12-Jul-08	0.1705	0.0443	0.6135	0.0434	0.2864	**0.45**	**0.05**	**0.05**	2.3	**0.7**	0.0422	0.2408	**0.0132**
		Minimum	0.0651	0.0207	0.1709	0.01085	0.1142	0.45	0.1	0.1	2.3	0.6	0.0	0.1	0.0
		Maximum	0.1705	0.0443	0.6135	0.0434	0.2864	4.2	1.3	3.4	11.2	0.8	0.1	0.2	0.0
		Median	0.0803	0.0276	0.2250	0.0303	0.1506	3.0	0.9	2.6	7.5	0.7	0.0	0.1	0.0
MPS4L	1	30-Aug-04													
MPS4	1	22-Jul-05													
MPS4M	1	30-Aug-04													
MPS4-0	1	14-Jul-08	**0.0038**	**0.00345**	0.0090	**0.00805**	0.0077	**0.3**	**0.05**	**0.05**	0.4	**0.45**	0.0383	**0.0041**	**0.00865**
MPSE	1	31-Aug-04													
MPSEM	1	31-Aug-04													
MPSEU	1	22-Jul-05													
MPSE	1	14-Jul-08	0.2372	0.0580	0.7248	0.0524	0.3536	**0.45**	**0.05**	**0.05**	2.4	**0.7**	0.0413	0.3367	0.0303
		Minimum													
		Maximum													
		Median													
MWGI	1	30-Aug-04													

Location ID	Replicate Number	Sample Date	C33 as n-Tritri-acontane	C34 as n-Tetratri-acontane	C35 as n-Pentatri-acontane	C3-Chrysenes	C3-Dibenzo-thiophenes	C3-Fluorenes	C3-Naphthalenes	C3-Phenanthrenes/ Anthracenes	C4-Chrysenes	C4-Naphthalenes	C4-Phenanthrenes/ Anthracenes	Chrysene	Dibenzo(a,h) anthracene
			µg/g	µg/g	µg/g	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg
MPS41	1	29-Aug-04													
MPS41	1	30-Aug-04													
MPS41	2	30-Aug-04													
MPS42	2	29-Aug-04													
MPS43	3	29-Aug-04													
MPS44	4	30-Aug-04													
MPS45	5	30-Aug-04													
MPS4	1	12-Jul-08	0.0733	**0.0155**	**0.01475**	1.9	1.0	3.3	7.2	6.5	**0.45**	1.9	1.5	2.9	0.3
MPS4	2	12-Jul-08	0.0344	**0.01575**	**0.0150**	2.1	0.7	2.2	4.6	4.5	**0.45**	1.6	3.8	2.0	**0.15**
MPS4	3	12-Jul-08	0.0367	**0.01865**	**0.0177**	2.0	0.8	1.4	5.5	5.3	**0.5**	1.6	1.1	2.3	**0.15**
MPS4	4	12-Jul-08	0.0296	**0.01435**	**0.01365**	1.1	0.6	2.1	3.8	4.2	**0.4**	1.7	0.8	1.8	**0.1**
MPS4	5	12-Jul-08	0.0784	0.0371	**0.01545**	**0.45**	**0.05**	**0.05**	1.0	1.4	**0.45**	**0.05**	**0.05**	2.7	**0.15**
		Minimum	0.0	0.0	0.0	0.5	0.1	0.1	1.0	1.4	0.4	0.1	0.1	1.8	0.1
		Maximum	0.1	0.0	0.0	2.1	1.0	3.3	7.2	6.5	0.5	1.9	3.8	2.9	0.3
		Median	0.0	0.0	0.0	1.9	0.7	2.1	4.6	4.5	0.5	1.6	1.1	2.3	0.2
MPS4L	1	30-Aug-04													
MPS4	1	22-Jul-05												**0.315**	**0.20**
MPS4M	1	30-Aug-04													
MPS4-0	1	14-Jul-08	**0.00195**	0.0232	**0.01015**	**0.3**	**0.05**	**0.05**	**0.05**	**0.05**	**0.3**	**0.05**	**0.05**	**0.15**	**0.1**
MPSE	1	31-Aug-04													
MPSEM	1	31-Aug-04													
MPSEU	1	22-Jul-05												**0.70**	**0.21**
MPSE	1	14-Jul-08	0.1102	0.0338	**0.01535**	**0.45**	**0.05**	**0.05**	1.0	1.6	**0.45**	**0.05**	**0.05**	4.7	**0.15**
		Minimum													
		Maximum													
		Median													
MWGI	1	30-Aug-04													

Location ID	Replicate Number	Sample Date	Dibenzofuran	Dibenzo-thiophene	Diesel Range Organics	Ethylbenzene	Fluoranthene	Fluorene	Gasoline Range Organics	Indeno (1,2,3-cd) pyrene	Naphthalene	Naphthalene, 1,6,7-trimethyl-	o-Xylene	PAHs, Total	Perylene	Phen-anthrene
			µg/kg	µg/kg	mg/kg	mg/kg	µg/kg	µg/kg	mg/kg	µg/kg	µg/kg	µg/kg	mg/kg	µg/kg	µg/kg	µg/kg
MPS41	1	29-Aug-04			29.7	0.00374			0.4245				0.00374			
MPS41	1	30-Aug-04														
MPS41	2	30-Aug-04														
MPS42	2	29-Aug-04			12.35	0.00144			0.86				0.00144			
MPS43	3	29-Aug-04			11.05	0.001315			0.77				0.001315			
MPS44	4	30-Aug-04			9.85	0.001155			0.55				0.001155			
MPS45	5	30-Aug-04			25.3	0.0012			0.6				0.0012			
MPS4	1	12-Jul-08		0.9			2.3	1.2		0.9	6.4	1.8		142.5	20.0	7.4
MPS4	2	12-Jul-08		0.8			1.6	0.7		0.6	4.2	1.2		99.8	14.1	5.4
MPS4	3	12-Jul-08		0.7			1.8	0.9		0.3	5.6	1.4		113.2	16.9	5.8
MPS4	4	12-Jul-08		0.5			1.4	0.7		0.25	3.5	1.1		84.0	13.1	4.4
MPS4	5	12-Jul-08		0.8			2.3	1.2		0.25	6.8	1.8		88.4	24.7	7.7
		Minimum	0.0	0.5	9.9	0.0	1.4	0.7	0.6	0.3	3.5	1.1	0.0	84.0	13.1	4.4
		Maximum	0.0	0.9	25.3	0.0	2.3	1.2	0.9	0.9	6.8	1.8	0.0	142.5	24.7	7.7
		Median	#NUM!	0.8	11.7	0.0	1.8	0.9	0.7	0.3	5.6	1.4	0.0	99.8	16.9	5.8
MPS4L	1	30-Aug-04			27.8	0.001325			0.384				0.001325			
MPS4	1	22-Jul-05	0.45		37	0.0075	0.26	0.15	0.6	0.185	1.95		0.0065			1.5
MPS4M	1	30-Aug-04			10.05	0.001165			0.595				0.001165			
MPS4-0	1	14-Jul-08		0.05			0.05	0.05		0.15	1.8	0.1		9.6	0.3	1.0
MPSE	1	31-Aug-04				0.003685			0.21				0.003685			
MPSEM	1	31-Aug-04			41.7											
MPSEU	1	22-Jul-05	0.69		23	0.008	0.68	0.47	0.7	0.195	2.05		0.0065			2.1
MPSE	1	14-Jul-08		0.9			5.0	1.5		0.7	6.1	1.9		118.2	36.9	8.2
		Minimum														
		Maximum														
		Median														
MWGI	1	30-Aug-04														

Location ID	Replicate Number	Sample Date	Phytane	Pristane	Pyrene	Residual Range Organics	Toluene	Total Alkanes	Total NS&T PAHs	Total Organic Carbon (TOC)	Total PAHs without Perylene	Total Resolved	Total TPH	Total UCM	Xylene, Isomers m & p
			µg/g	µg/g	µg/kg	mg/kg	mg/kg	µg/g	µg/kg	percent	µg/kg	µg/g	µg/g	µg/g	mg/kg
MPS41	1	29-Aug-04				**29.7**	**0.0075**			0.73					**0.0075**
MPS41	1	30-Aug-04								0.229					
MPS41	2	30-Aug-04								0.381					
MPS42	2	29-Aug-04				29.5	**0.002775**			1.1					**0.002775**
MPS43	3	29-Aug-04				**11.05**	**0.002525**			1.17					**0.002525**
MPS44	4	30-Aug-04				29.7	**0.00222**			0.308					**0.00222**
MPS45	5	30-Aug-04				39.4	**0.00231**			0.61					**0.00231**
MPS4	1	12-Jul-08	**0.00425**	**0.01185**	2.6			1.9745	69.5	0.64	122.4	6.03	14.43	8.40	
MPS4	2	12-Jul-08	**0.0043**	**0.0120**	1.7			1.0640	47.0	0.45	85.7	3.83	10.42	6.58	
MPS4	3	12-Jul-08	**0.0051**	**0.0142**	1.9			1.2379	56.3	0.50	96.3	4.35	9.24	4.89	
MPS4	4	12-Jul-08	**0.00395**	**0.01095**	1.5			0.9262	41.3	0.66	70.9	3.64	7.57	3.92	
MPS4	5	12-Jul-08	**0.00445**	**0.0124**	2.6			2.1555	75.3	0.58	63.7	5.94	12.71	6.77	
		Minimum	0.0	0.0	1.5	11.1	0.0	0.9	41.3	0.3	63.7	3.6	7.6	3.9	0.00222
		Maximum	0.0	0.0	2.6	39.4	0.0	2.2	75.3	1.2	122.4	6.0	14.4	8.4	0.002775
		Median	0.0	0.0	1.9	29.6	0.0	1.2	56.3	0.6	85.7	4.4	10.4	6.6	0.00242
MPS4L	1	30-Aug-04				58.5	**0.00255**			0.782					**0.00255**
MPS4	1	22-Jul-05			**0.28**	**60**	**0.0075**			0.58					**0.0145**
MPS4M	1	30-Aug-04				33	**0.002235**			0.521					**0.002235**
MPS4-0	1	14-Jul-08	**0.0029**	**0.00815**	**0.25**			0.1979	8.5	0.48	9.5	0.65	10.55	0.35	
MPSE	1	31-Aug-04					**0.00735**								**0.00735**
MPSEM	1	31-Aug-04				45.9				0.632					
MPSEU	1	22-Jul-05			**0.95**	**60**	**0.008**			0.93					**0.015**
MPSE	1	14-Jul-08	**0.00445**	**0.01235**	5.5			2.6808	100.2	0.71	81.3	8.52	17.39	8.87	
		Minimum								0.632					
		Maximum								0.93					
		Median								0.71					
MWGI	1	30-Aug-04								0.461					

Location ID	Replicate Number	Sample Date	1-Methyl-naphthalene µg/kg	1-Methyl-phenanthrene µg/kg	2,6-Dimethyl-naphthalene µg/kg	2-Methyl-naphthalene µg/kg	Ace-naphthene µg/kg	Ace-naphthylene µg/kg	Anthracene µg/kg	Benzene mg/kg	Benzo(a) anthracene µg/kg	Benzo(a)-pyrene µg/kg	Benzo(b)-fluoranthene µg/kg	Benzo(e)-pyrene µg/kg

1 mg/kg = 1,000 µg/kg

Location ID	Replicate Number	Sample Date	Benzo(g,h,i)-perylene	Benzo(k)-fluoranthene	Biphenyl	C1 - Naphthalenes	C10 as n-Decane	C11 as n-Undecane	C12 as n-Dodecane	C13 as n-Tridecane	C14 as n-Tetradecane	C15 as n-Pentadecane	C16 as n-Hexadecane	C17 as n-Heptadecane
			µg/kg	µg/kg	µg/kg	µg/kg	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g

Location ID	Replicate Number	Sample Date	C18 as n-Octadecane	C19 as n-Nonadecane	C1-Chrysenes	C1-Dibenzo-thiophenes	C1-Fluoranthenes/ Pyrenes	C1-Fluorenes	C1-Phenanthrenes/ Anthracenes	C2 - Fluoranthenes/ Pyrenes	C20 as n-Eicosane	C21 as n-Henei-cosane	C22 as n-Do-cosane	C23 as n-Tri-cosane	C24 as n-Tetra-cosane
			µg/g	µg/g	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/g	µg/g	µg/g	µg/g	µg/g

Location ID	Replicate Number	Sample Date	C25 as n-Penta-cosane	C26 as n-Hexa-cosane	C27 as n-Hepta-cosane	C28 as n-Octa-cosane	C29 as n-Nona-cosane	C2-Chrysenes	C2-Dibenzo-thiophenes	C2-Fluorenes	C2-Naphthalenes	C3 -Fluoranthenes / Pyrenes	C30 as n-Tri-acontane	C31 as n-Hentri-acontane	C32 as n-Dotri-acontane
			µg/g	µg/g	µg/g	µg/g	µg/g	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/g	µg/g	µg/g

Location ID	Replicate Number	Sample Date	C33 as n-Tritri-acontane	C34 as n-Tetratri-acontane	C35 as n-Pentatri-acontane	C3-Chrysenes	C3-Dibenzo-thiophenes	C3-Fluorenes	C3-Naphthalenes	C3-Phenanthrenes/ Anthracenes	C4-Chrysenes	C4-Naphthalenes	C4-Phenanthrenes/ Anthracenes	Chrysene	Dibenzo(a,h) anthracene
			µg/g	µg/g	µg/g	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg

Location ID	Replicate Number	Sample Date	Dibenzofuran	Dibenzo-thiophene	Diesel Range Organics	Ethylbenzene	Fluoranthene	Fluorene	Gasoline Range Organics	Indeno (1,2,3-cd) pyrene	Naphthalene	Naphthalene, 1,6,7-trimethyl-	o-Xylene	PAHs, Total	Perylene	Phen-anthrene
			µg/kg	µg/kg	mg/kg	mg/kg	µg/kg	µg/kg	mg/kg	µg/kg	µg/kg	µg/kg	mg/kg	µg/kg	µg/kg	µg/kg

Location ID	Replicate Number	Sample Date	Phytane	Pristane	Pyrene	Residual Range Organics	Toluene	Total Alkanes	Total NS&T PAHs	Total Organic Carbon (TOC)	Total PAHs without Perylene	Total Resolved	Total TPH	Total UCM	Xylene, Isomers m & p
			µg/g	µg/g	µg/kg	mg/kg	mg/kg	µg/g	µg/kg	percent	µg/kg	µg/g	µg/g	µg/g	mg/kg

APPENDIX 35.4A3

Key to Location Identification Codes Used in Appendices and Station Codes Used in Tables and Figures

Appendix 35.4A3 Key to Location Identification Codes Used in Appendix and Station Codes Used in Tables and Figures

Station Codes Differ between Data in Appendices and Data Presented in Tables, Graphs and Maps due to a Refinement of *Station Naming Conventions* ~~[the Nomenclature Structure]~~ Over Time

Location Code in Appendix	Station Code in Tables and Graphs[a]	Station Code on Map Figures	Tidal Environment	Tidal Elevation	Sediment Stratum	Year	Notes
MBB	MBBL	MBB	intertidal	low	surface	2005	
MBB-0	MBBL	MBB	intertidal	low	surface	2008	
MBB-8	MBBL	MBB	intertidal	low	subsurface	2008	
MBSA1	MBSA1M	MBSA1	intertidal	mid	surface	2005	
MBSA1-0	MBSA1M	MBSA1	intertidal	mid	surface	2008	
MOPP1	MOPP1	MOPP1	subtidal	--	surface	2004	
MOPP11	MOPP1	MOPP1	subtidal	--	surface	2008	
MOPP12	MOPP1	MOPP1	subtidal	--	surface	2008	
MOPP13	MOPP1	MOPP1	subtidal	--	surface	2008	
MOPP14	MOPP1	MOPP1	subtidal	--	surface	2008	
MOPP15	MOPP1	MOPP1	subtidal	--	surface	2008	
MPS11	MPS1	MPS1	subtidal	--	surface	2004	
MPS12	MPS1	MPS1	subtidal	--	surface	2004	
MPS13	MPS1	MPS1	subtidal	--	surface	2004	
MPS14	MPS1	MPS1	subtidal	--	surface	2004	
MPS15	MPS1	MPS1	subtidal	--	surface	2004	
MPS1	MPS1	MPS1	subtidal	--	surface/subsurface	2008	5 replicates taken at this station (Replicates 1 through 5) plus one subsurface sample ("Replicate 9")
MPS1L	MPS1L	MPS1	intertidal	low	surface	2004	
MPS1M	MPS1M	MPS1	intertidal	mid	surface	2004	
MPS1A	MPS1AM	MPS1A	intertidal	mid	surface	2005	
MPS2	MPS2	MPS2	subtidal	--	surface	2004	
MPS21	MPS2	MPS2	subtidal	--	surface	2004	
MPS22	MPS2	MPS2	subtidal	--	surface	2004	
MPS23	MPS2	MPS2	subtidal	--	surface	2004	
MPS24	MPS2	MPS2	subtidal	--	surface	2004	
MPS25	MPS2	MPS2	subtidal	--	surface	2004	
MPS2L	MPS2L	MPS2	intertidal	low	surface	2004	
MPS2	MPS2L	MPS2	intertidal	low	surface	2005	
MPS2-0	MPS2L	MPS2	intertidal	low	surface	2008	
MPS2M	MPS2M	MPS2	intertidal	mid	surface	2004	
MPS3-0	MPS3M	MPS3	intertidal	low	surface	2008	
MPS3M	MPS3M	MPS3	intertidal	mid	surface	2004	
MPS3	MPS3M	MPS3	intertidal	mid	surface	2005	
MPS3L	MPS3L	MPS3	intertidal	low	surface	2004	
MPS3-0	MPS3L	MPS3	intertidal	low	surface	2008	
MPS3-8	MPS3L	MPS3	intertidal	low	subsurface	2008	
MPS41	MPS4	MPS4	subtidal	--	surface	2004	
MPS42	MPS4	MPS4	subtidal	--	surface	2004	
MPS43	MPS4	MPS4	subtidal	--	surface	2004	
MPS44	MPS4	MPS4	subtidal	--	surface	2004	
MPS45	MPS4	MPS4	subtidal	--	surface	2004	
MPS4	MPS4	MPS4	subtidal	--	surface	2008	five replicates collected 12-Jul-08
MPS4L	MPS4L	MPS4	intertidal	low	surface	2004	
MPS4	MPS4L	MPS4	intertidal	low	surface	2005	sample collected 22-Jul-05
MPS4M	MPS4M	MPS4	intertidal	mid	surface	2004	
MPS4-0	MPS4M	MPS4	intertidal	mid	surface	2008	
MPSEM	MPSEM	MPSE	intertidal	mid	surface	2004	
MPSEU	MPSEM	MPSE	intertidal	mid	surface	2005	
MPSE	MPSEM	MPSE	intertidal	mid	surface	2008	
MWGI	MWGI	MWGI	subtidal	--	surface	2004	

a. The letters "M" or "L" at the end of the station code for intertidal sediment indicate the tidal elevation where the sample was collected, i.e., middle or lower, respectively.

APPENDIX 35.4A4

Atomic Weight for Specified Elements and Sulfide

Appendix 35.4A3, Atomic Weights for Specified Elements and Sulfide

Analyte	Atomic Weight
Cadmium	112.41
Copper	63.55
Lead	207.20
Mercury	200.59
Nickel	58.69
Zinc	65.39
Sulfide	32.07

APPENDIX 35.4B

Laboratory Data Summary for Inorganic Constituents in Rockweed 2008

Appendix 35.4B Laboratory Data Summary for Marine Plants, Inorganic Constituents 2008

		Total Solids	Antimony	Arsenic	Beryllium	Boron	Cadmium	Chromium	Copper	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Tin	Zinc
Location-Species		**percent**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**
MPS1B-*Fucus distichus subsp. Evanescens*																		
Sample Date	**Sample #**																	
09/17/08	1	15.2	0.07	26.9	**0.0025**	94.0	1.700	**0.9**	5.83	0.30	0.0067	0.37	6.69	**0.5**	0.150	0.024	**1**	10.7
	Mean	15.2	0.07	26.9	0.0025	94.0	1.700	0.9	5.83	0.30	0.0067	0.37	6.69	0.5	0.150	0.024	1	10.7
	Median	15.2	0.07	26.9	0.0025	94.0	1.700	0.9	5.83	0.30	0.0067	0.37	6.69	0.5	0.150	0.024	1	10.7
	St. Deviation	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	# of values	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Minimum																	
	Maximum																	
	% of values undetected				100%									100%			100%	
	# of values between MDL and MRL							1										
MPS1*-*Fucus distichus subsp. Evanescens*																		
Sample Date	**Sample #**																	
05/24/08	1	16.2	0.05	33.0	**0.0025**	113	1.960	**0.5**	10.3	0.15	0.050	0.23	7.26	**0.075**	0.227	**0.008**	**0.5**	16.0
07/19/08	1	12.2	0.05	21.0	**0.01**	130	1.280	2.4	4.18	0.27	0.019	0.23	5.08	**0.075**	0.092	**0.013**	**4.95**	7.77
	Mean	14.2	0.05	27.0	0.01	122	1.620	1	7.2	0.21	0.035	0.23	6.17	0.075	0.160	0.011	2.7	11.9
	Median	14.2	0.05	27.0	0.01	122	1.620	1	7.2	0.21	0.035	0.23	6.17	0.075	0.160	0.011	2.7	11.9
	St. Deviation	2.8	0	8.5	0.01	12	0.481	1	4.3	0.08	0.022	0	1.54	0	0.095	0.004	3.1	5.8
	# of values	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
	Minimum	12.2	0.05	21.0	0.0025	113	1.280	0.5	4.18	0.15	0.019	0.23	5.08	0.075	0.092	0.008	0.5	7.77
	Maximum	16.2	0.05	33.0	0.01	130	1.960	2.4	10.3	0.27	0.050	0.23	7.26	0.075	0.227	0.013	4.95	16.0
	% of values undetected				100%									100%			100%	
	# of values between MDL and MRL							1			1					2		
MPS2-*Fucus distichus subsp. Evanescens*																		
Sample Date	**Sample #**																	
07/15/08	1	16.7	0.06	36.4	**0.01**	98.4	2.060	2.4	6.51	0.33	0.020	0.27	6.58	**0.075**	0.130	**0.011**	**4.95**	10.1
	Mean	16.7	0.06	36.4	0.01	98.4	2.060	2.4	6.51	0.33	0.020	0.27	6.58	0.075	0.130	0.011	4.95	10.1
	Median	16.7	0.06	36.4	0.01	98.4	2.060	2.4	6.51	0.33	0.020	0.27	6.58	0.075	0.130	0.011	4.95	10.1
	St. Deviation	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	# of values	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Minimum																	
	Maximum																	
	% of values undetected				100%									100%			100%	
	# of values between MDL and MRL															1		

		Total Solids	Antimony	Arsenic	Beryllium	Boron	Cadmium	Chromium	Copper	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Tin	Zinc
Location-Species		**percent**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**
MPS3-*Fucus distichus subsp. Evanescens*																		
Sample Date	**Sample #**																	
07/12/08	1	15.1	0.06	19.4	**0.01**	118	1.340	1.8	6.38	0.18	0.009	0.19	6.69	**0.075**	0.080	0.007	**4.95**	8.19
	Mean	15.1	0.06	19.4	0.01	118	1.340	1.8	6.38	0.18	0.009	0.19	6.69	0.075	0.080	0.007	4.95	8.19
	Median	15.1	0.06	19.4	0.01	118	1.340	1.8	6.38	0.18	0.009	0.19	6.69	0.075	0.080	0.007	4.95	8.19
	St. Deviation	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	# of values	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Minimum																	
	Maximum																	
	% of values undetected				100%									100%			100%	
	# of values between MDL and MRL							1			1					1		
MPS4-*Fucus distichus subsp. Evanescens*																		
Sample Date	**Sample #**																	
05/25/08	1	15.3	0.07	36.5	**0.0025**	89.4	2.320	0.7	9.14	0.20	0.0145	0.22	8.99	**0.075**	0.181	0.009	**0.5**	18.9
07/12/08	1	15.9	0.08	22.7	**0.0095**	126	1.830	3.8	6.27	0.19	0.012	0.22	8.30	**0.075**	0.127	0.009	**4.9**	9.1
09/16/08	1	15.4	0.07	36.5	0.006	134	1.800	2.0	6.72	0.56	0.0109	0.32	5.99	**0.075**	0.150	0.015	**1**	10.6
	Mean	15.5	0.073	31.9	0.006	116	1.983	2.2	7.38	0.32	0.0125	0.25	7.76	0.075	0.153	0.011	2.1	12.9
	Median	15.4	0.07	36.5	0.006	126	1.830	2.0	6.72	0.20	0.012	0.22	8.30	0.075	0.150	0.009	1	10.6
	St. Deviation	0.3	0.006	8	0.0035	24	0.292	1.6	1.54	0.21	0.0018	0.06	1.57	0	0.027	0.003	2.4	5.3
	# of values	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
	Minimum	15.3	0.07	22.7	0.0025	89.4	1.800	0.7	6.27	0.19	0.0109	0.22	5.99	0.075	0.127	0.009	0.5	9.1
	Maximum	15.9	0.08	36.5	0.0095	134	2.320	3.8	9.14	0.56	0.0145	0.32	8.99	0.075	0.181	0.015	4.9	18.9
	% of values undetected				67%									100%			100%	
	# of values between MDL and MRL							1			1					3		

Notes:

*The sampling station for these samples (as reflected in the tables and figures in the environmental baseline document) is MPS1B.

Bold Results = Parameter undetected by test, value shown is 1/2 MDL or 1/2 MRL.

If result was not detected at the lab MDL, the value shown is 1/2 MDL.

If result was validation flagged U or UJ, the value shown is 1/2 MRL.

Green Results = Estimate result reported by laboratory below reporting limit (MRL).

MDL = Method Detection Limit.

MRL = Method Reporting Limit.

NA = Not applicable.

All results reported on dry weight basis, except total solids reported on wet weight basis. Each sample consisted of fronds from more than 10 individual plant bodies.

1 mg/kg = 1 milligram per kilogram.

APPENDIX 35.4C1

Laboratory Data Summary for Inorganic Constituents in Marine Fish and Invertebrates 2004 through 2008

Appendix 35.4C1, Laboratory Data Summary for Marine Tissues, Inorganic Constituents

Location-Species-Tissue-Age		Total Solids percent	Antimony mg/kg	Arsenic mg/kg	Beryllium mg/kg	Boron mg/kg	Cadmium mg/kg	Chromium mg/kg	Copper mg/kg	Lead mg/kg	Mercury mg/kg	Molybdenum mg/kg	Nickel mg/kg	Selenium mg/kg	Silver mg/kg	Thallium mg/kg	Tin mg/kg	Zinc mg/kg
ILIAMNA-Oncorhynchus keta-MUSCLE-Age ADULT																		
Sample Date	Fish #																	
08/13/08	1	26.0	0.004	0.58	0.0035	0.678	0.005	0.035	1.74	0.025	0.111	0.004	0.05	1.18	0.0035	0.0015	0.025	12.4
08/13/08	2	26.2	0.004	0.82	0.0035	0.312	0.008	0.035	2.03	0.025	0.177	0.004	0.02	0.49	0.0035	0.0015	0.025	12.8
08/13/08	3	27.5	0.0035	1.04	0.003	0.143	0.0025	0.03	1.63	0.017	0.133	0.0035	0.02	0.46	0.003	0.0015	0.025	15.4
Mean		26.6	0.0038	0.81	0.0033	0.378	0.0052	0.033	1.8	0.022	0.140	0.0038	0.03	0.71	0.0033	0.0015	0.025	13.5
Median		26.2	0.004	0.82	0.0035	0.312	0.005	0.035	1.74	0.025	0.133	0.004	0.02	0.49	0.0035	0.0015	0.025	12.8
St. Deviation		0.8	0.0003	0.23	0.0003	0.273	0.0028	0.003	0.21	0.005	0.034	0.0003	0.017	0.41	0.0003	0	0	1.6
# of values		3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Minimum		26	0.0035	0.58	0.003	0.143	0.0025	0.03	1.63	0.017	0.111	0.0035	0.02	0.46	0.003	0.0015	0.025	12.4
Maximum		27.5	0.004	1.04	0.0035	0.678	0.008	0.035	2.03	0.025	0.177	0.004	0.05	1.18	0.0035	0.0015	0.025	15.4
% of values undetected			100%		100%		33%	100%				100%	67%	67%	100%	100%	100%	
# of values between MDL and MRL							2			1			1					
ILIAMNA-Platichthys stellatus -WHOLE-Age not spec																		
Sample Date	Fish #																	
07/15/08	1	20.3	0.048	6.57	0.0035	3.26	0.039	6.67	31.0	1.44	0.0778	0.129	14.5	0.8	0.039	0.009	0.86	107
07/15/08	2	21.4	0.027	4.33	0.0035	3.32	0.041	3.19	12.7	0.701	0.0639	0.083	7.01	0.7	0.015	0.007	0.27	80
07/15/08	3	22.8	0.019	4.61	0.0035	2.54	0.030	4.73	12.1	0.704	0.0811	0.092	6.78	0.7	0.014	0.005	0.30	66.4
07/15/08	4	21.5	0.010	4.50	0.0035	1.73	0.030	1.20	12.2	0.405	0.0603	0.045	3.93	0.4	0.049	0.005	0.37	82.3
07/15/08	5	20.9	0.017	3.85	0.0035	2.87	0.026	2.14	8.05	0.403	0.0694	0.077	3.24	0.4	0.021	0.006	0.76	69.6
07/15/08	6	21.6	0.008	3.60	0.003	2.35	0.022	2.46	12.3	0.455	0.0518	0.050	4.73	0.4	0.003	0.003	0.60	68.5
07/15/08	7	21.6	0.012	4.28	0.0035	2.63	0.031	2.42	15.6	0.854	0.0667	0.086	5.15	0.5	0.017	0.005	0.16	82.7
07/15/08	8	21.6	0.133	3.98	0.013	3.28	0.045	6.10	9.61	0.624	0.0710	0.147	5.34	0.7	0.047	0.040	0.50	54.2
Mean		21.5	0.034	4.47	0.0046	2.75	0.033	3.61	14.2	0.698	0.0678	0.089	6.34	0.6	0.026	0.010	0.48	76.3
Median		21.6	0.018	4.31	0.0035	2.75	0.031	2.83	12.3	0.663	0.0681	0.085	5.25	0.6	0.019	0.006	0.44	74.8
St. Deviation		0.7	0.042	0.92	0.0034	0.55	0.008	1.99	7.10	0.341	0.0094	0.035	3.54	0.2	0.017	0.012	0.25	15.7
# of values		8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
Minimum		20.3	0.008	3.60	0.003	1.73	0.022	1.20	8.05	0.403	0.0518	0.045	3.24	0.4	0.003	0.003	0.16	54.2
Maximum		22.8	0.133	6.57	0.013	3.32	0.045	6.67	31.0	1.44	0.0811	0.147	14.5	0.8	0.049	0.04	0.86	107
% of values undetected					88%										13%			
# of values between MDL and MRL			7		1							1		8	3	7		
ILIAMNA-Salvelinus malma Walbaum-WHOLE-Age JUV																		
Sample Date	Fish #																	
07/12/08	1	21.8	0.004	3.58	0.0035	3.14	0.086	0.43	10.1	0.070	0.0546	0.088	1.33	0.9	0.163	0.009	0.11	105
07/12/08	2	20.6	0.0035	2.74	0.003	1.74	0.082	0.45	12.3	0.202	0.0976	0.071	2.42	1.1	0.054	0.008	0.22	138
07/12/08	3	23.4	0.004	3.29	0.0035	1.01	0.050	0.22	7.66	0.164	0.0733	0.050	1.64	1.6	0.026	0.003	0.22	93.6
07/12/08	4	21.0	0.021	2.73	0.0035	2.24	0.184	0.45	9.34	0.071	0.0722	0.098	1.35	1.1	0.041	0.012	0.12	124
07/12/08	5	20.7	0.008	3.14	0.0035	1.41	0.044	1.07	10.6	0.087	0.1020	0.075	1.69	0.8	0.039	0.008	0.28	125
07/12/08	6	20.9	0.041	2.56	0.003	1.40	0.028	0.72	7.25	0.058	0.0619	0.054	1.33	0.8	0.018	0.005	0.92	120
07/12/08	7	20.5	0.0035	2.53	0.003	1.62	0.043	0.38	9.38	0.064	0.1180	0.063	1.42	1.2	0.034	0.006	0.14	123
07/12/08	8	22.5	0.003	2.93	0.0025	1.47	0.074	0.58	9.92	0.056	0.0444	0.06	1.33	0.9	0.051	0.005	0.08	105
Mean		21.4	0.011	2.94	0.0032	1.75	0.074	0.54	9.57	0.097	0.0780	0.070	1.56	1.1	0.053	0.007	0.26	117
Median		21	0.004	2.84	0.0033	1.55	0.062	0.45	9.65	0.071	0.0728	0.067	1.39	1.0	0.04	0.007	0.18	122
St. Deviation		1	0.014	0.37	0.0004	0.66	0.049	0.26	1.61	0.055	0.0255	0.017	0.38	0.3	0.046	0.003	0.27	14
# of values		8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
Minimum		20.5	0.003	2.53	0.0025	1.01	0.028	0.22	7.25	0.056	0.0444	0.050	1.33	0.8	0.018	0.003	0.08	93.6
Maximum		23.4	0.041	3.58	0.0035	3.14	0.184	1.07	12.3	0.202	0.1180	0.098	2.42	1.6	0.163	0.012	0.92	138
% of values undetected			63%		100%													
# of values between MDL and MRL			2					7						2		8		

Location-Species-Tissue-Age		Total Solids percent	Antimony mg/kg	Arsenic mg/kg	Beryllium mg/kg	Boron mg/kg	Cadmium mg/kg	Chromium mg/kg	Copper mg/kg	Lead mg/kg	Mercury mg/kg	Molybdenum mg/kg	Nickel mg/kg	Selenium mg/kg	Silver mg/kg	Thallium mg/kg	Tin mg/kg	Zinc mg/kg
INISKIN-Limanda aspera-WHOLE-Age not spec																		
Sample Date	**Fish #**																	
07/15/08	1	23.4	**0.008**	8.29	**0.003**	1.99	0.064	1.03	12.1	0.265	0.0466	0.054	3.01	1.4	0.036	**0.0015**	0.47	62.4
07/15/08	2	23.2	**0.004**	14.8	**0.0035**	2.10	0.039	**0.9**	3.33	0.107	0.0801	0.070	3.08	1.8	**0.008**	**0.0015**	0.09	61.1
07/15/08	4	23.1	**0.0035**	9.58	**0.003**	1.91	0.063	1.21	4.70	0.129	0.0689	0.074	2.18	1.3	**0.008**	**0.003**	0.23	54.5
07/15/08	6	22.1	**0.012**	11.4	**0.0035**	2.32	0.075	3.69	4.64	0.140	0.0786	0.073	3.29	1.4	**0.0035**	**0.003**	0.33	69.9
07/17/08	8	22.2	**0.004**	13.8	**0.0035**	2.00	0.088	**0.47**	4.83	0.130	0.1380	0.092	2.04	1.6	**0.0035**	**0.0015**	0.22	61.1
Mean		22.8	0.0063	11.6	0.0033	2.06	0.066	1.46	5.92	0.154	0.0824	0.073	2.72	1.5	0.0118	0.0021	0.27	61.8
Median		23.1	0.004	11.4	0.0035	2.00	0.064	1.03	4.70	0.130	0.0786	0.073	3.01	1.4	0.008	0.0015	0.23	61.1
St. Deviation		0.6	0.0037	2.7	0.0003	0.16	0.018	1.28	3.51	0.063	0.0338	0.014	0.57	0.2	0.0137	0.0008	0.14	5.5
# of values		5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Minimum		22.1	0.0035	8.29	0.003	1.91	0.039	0.47	3.33	0.107	0.0466	0.054	2.04	1.3	0.0035	0.0015	0.09	54.5
Maximum		23.4	0.012	14.8	0.0035	2.32	0.088	3.69	12.1	0.265	0.1380	0.092	3.29	1.8	0.036	0.003	0.47	69.9
% of values undetected			60%		100%										40%	60%		
# of values between MDL and MRL			2					2							2	2		
INISKIN-Salvelinus malma Walbaum-WHOLE-Age JUV																		
Sample Date	**Fish #**																	
07/17/08	1	22.3	**0.013**	2.33	**0.0035**	1.17	0.070	**0.39**	8.39	0.063	0.0576	0.060	1.16	**0.8**	0.050	**0.006**	0.16	121
07/17/08	2	21.4	**0.0035**	1.89	**0.003**	1.72	0.064	**0.29**	10.5	0.087	0.1440	0.060	1.09	1.1	0.040	**0.006**	0.16	124
07/17/08	3	23.3	**0.015**	2.28	**0.0035**	1.12	0.075	**0.19**	8.86	0.050	0.0628	0.058	1.54	**0.8**	0.045	**0.008**	0.06	110
07/17/08	4	22.2	**0.0035**	2.20	**0.003**	3.01	0.125	**0.32**	27.6	0.677	0.0513	0.083	5.27	1.4	0.108	**0.005**	0.15	138
07/17/08	5	21.6	**0.004**	2.34	**0.0035**	2.59	0.102	**0.48**	14.2	0.119	0.0774	0.094	1.28	1.2	0.067	**0.008**	0.32	141
07/17/08	6	22.0	**0.004**	2.29	**0.0035**	2.93	0.098	**0.24**	14.5	0.052	0.0997	0.082	1.16	1.0	0.090	**0.007**	**0.025**	131
07/17/08	7	21.8	**0.008**	3.29	**0.0035**	2.22	0.062	**0.52**	17.0	0.422	0.1150	0.110	3.91	**0.9**	0.043	**0.006**	0.14	126
07/17/08	8	21.0	**0.009**	1.76	**0.003**	3.34	0.051	**0.29**	9.16	0.087	0.0404	0.063	1.13	1.6	0.041	**0.004**	0.09	137
Mean		22	0.008	2.30	0.0033	2.26	0.081	0.34	13.8	0.195	0.0810	0.076	2.07	1.1	0.061	0.006	0.14	129
Median		21.9	0.006	2.29	0.0035	2.41	0.073	0.31	12.4	0.087	0.0701	0.073	1.22	1.1	0.048	0.006	0.15	129
St. Deviation		0.7	0.005	0.46	0.0003	0.85	0.025	0.11	6.40	0.230	0.0357	0.019	1.60	0.3	0.026	0.001	0.09	10
# of values		8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
Minimum		21	0.0035	1.76	0.003	1.12	0.051	0.19	8.39	0.050	0.0404	0.058	1.09	0.8	0.040	0.004	0.025	110
Maximum		23.3	0.015	3.29	0.0035	3.34	0.125	0.52	27.6	0.677	0.1440	0.110	5.27	1.6	0.108	0.008	0.32	141
% of values undetected			50%		100%												13%	
# of values between MDL and MRL			4					8						3		8		
MBS03-Platichthys stellatus -WHOLE-Age NOT SPEC																		
Sample Date	**Fish #**																	
05/10/05	1	19.0	**0.008**	2.17	**0.004**		0.113	0.8	12.4	7.34	0.0217	0.08	3.9	2.6	0.044	**0.012**		81.6
Mean		19.0	0.008	2.17	0.004		0.113	0.8	12.4	7.34	0.0217	0.08	3.9	2.6	0.044	0.012		81.6
Median		19.0	0.008	2.17	0.004		0.113	0.8	12.4	7.34	0.0217	0.08	3.9	2.6	0.044	0.012		81.6
St. Deviation		NA	NA	NA	NA		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		NA
# of values		1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	0	1
Minimum		19.0	0.008	2.17	0.004		0.113	0.8	12.4	7.34	0.0217	0.08	3.9	2.6	0.044	0.012		81.6
Maximum		19.0	0.008	2.17	0.004		0.113	0.8	12.4	7.34	0.0217	0.08	3.9	2.6	0.044	0.012		81.6
% of values undetected																		
# of values between MDL and MRL			1		1											1		

Location-Species-Tissue-Age		Total Solids percent	Antimony mg/kg	Arsenic mg/kg	Beryllium mg/kg	Boron mg/kg	Cadmium mg/kg	Chromium mg/kg	Copper mg/kg	Lead mg/kg	Mercury mg/kg	Molybdenum mg/kg	Nickel mg/kg	Selenium mg/kg	Silver mg/kg	Thallium mg/kg	Tin mg/kg	Zinc mg/kg
MBS04-Salvelinus malma Walbaum-WHOLE-Age NOT SPEC																		
Sample Date	Fish #																	
08/17/05	1	25.0	**0.004**	0.81	**0.0015**		**0.012**	**0.15**	4.8	0.02	0.151	**0.025**	2.77	**0.6**	**0.01**	**0.005**		61.7
Mean		25.0	0.004	0.81	0.0015		0.012	0.15	4.8	0.02	0.151	0.025	2.77	0.6	0.01	0.005		61.7
Median		25.0	0.004	0.81	0.0015		0.012	0.15	4.8	0.02	0.151	0.025	2.77	0.6	0.01	0.005		61.7
St. Deviation		NA	NA	NA	NA		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		NA
# of values		1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	0	1
Minimum		25.0	0.004	0.81	0.0015		0.012	0.15	4.8	0.02	0.151	0.025	2.77	0.6	0.01	0.005		61.7
Maximum		25.0	0.004	0.81	0.0015		0.012	0.15	4.8	0.02	0.151	0.025	2.77	0.6	0.01	0.005		61.7
% of values undetected			100%		100%			100%				100%			100%			
# of values between MDL and MRL							1							1		1		
MBS3A-Pleuronectidae family-WHOLE-Age NOT SPEC																		
Sample Date	Fish #																	
08/17/05	1	20.8	**0.004**	2.87	**0.0015**		**0.006**	**0.15**	2.6	0.03	0.0982	**0.025**	1.4	**0.3**	**0.01**	**0.001**		64.4
Mean		20.8	0.004	2.87	0.0015		0.006	0.15	2.6	0.03	0.0982	0.025	1.4	0.3	0.01	0.001		64.4
Median		20.8	0.004	2.87	0.0015		0.006	0.15	2.6	0.03	0.0982	0.025	1.4	0.3	0.01	0.001		64.4
St. Deviation		NA	NA	NA	NA		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		NA
# of values		1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	0	1
Minimum		20.8	0.004	2.87	0.0015		0.006	0.15	2.6	0.03	0.0982	0.025	1.4	0.3	0.01	0.001		64.4
Maximum		20.8	0.004	2.87	0.0015		0.006	0.15	2.6	0.03	0.0982	0.025	1.4	0.3	0.01	0.001		64.4
% of values undetected			100%		100%			100%				100%			100%	100%		
# of values between MDL and MRL							1							1				
MBSA1-Cottidae sp.-WHOLE-Age NOT SPEC																		
Sample Date	Fish #																	
08/17/05	1	20.3	**0.004**	4.04	**0.0015**		**0.014**	**0.15**	6.1	0.06	0.0763	**0.025**	1.26	**0.9**	**0.01**	**0.005**		34.2
Mean		20.3	0.004	4.04	0.0015		0.014	0.15	6.1	0.06	0.0763	0.025	1.26	0.9	0.01	0.005		34.2
Median		20.3	0.004	4.04	0.0015		0.014	0.15	6.1	0.06	0.0763	0.025	1.26	0.9	0.01	0.005		34.2
St. Deviation		NA	NA	NA	NA		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		NA
# of values		1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	0	1
Minimum		20.3	0.004	4.04	0.0015		0.014	0.15	6.1	0.06	0.0763	0.025	1.26	0.9	0.01	0.005		34.2
Maximum		20.3	0.004	4.04	0.0015		0.014	0.15	6.1	0.06	0.0763	0.025	1.26	0.9	0.01	0.005		34.2
% of values undetected			100%		100%			100%				100%			100%			
# of values between MDL and MRL							1							1		1		
MBSA1-Pleuronectidae family-WHOLE-Age NOT SPEC																		
Sample Date	Fish #																	
08/17/05	1	21.2	**0.004**	10.9	**0.0015**		**0.009**	**0.15**	2.6	0.03	0.0835	**0.025**	1.23	1.1	**0.01**	**0.002**		83.3
Mean		21.2	0.004	10.9	0.0015		0.009	0.15	2.6	0.03	0.0835	0.025	1.23	1.1	0.01	0.002		83.3
Median		21.2	0.004	10.9	0.0015		0.009	0.15	2.6	0.03	0.0835	0.025	1.23	1.1	0.01	0.002		83.3
St. Deviation		NA	NA	NA	NA		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		NA
# of values		1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	0	1
Minimum		21.2	0.004	10.9	0.0015		0.009	0.15	2.6	0.03	0.0835	0.025	1.23	1.1	0.01	0.002		83.3
Maximum		21.2	0.004	10.9	0.0015		0.009	0.15	2.6	0.03	0.0835	0.025	1.23	1.1	0.01	0.002		83.3
% of values undetected			100%		100%			100%				100%			100%			
# of values between MDL and MRL							1									1		

Location-Species-Tissue-Age		Total Solids percent	Antimony mg/kg	Arsenic mg/kg	Beryllium mg/kg	Boron mg/kg	Cadmium mg/kg	Chromium mg/kg	Copper mg/kg	Lead mg/kg	Mercury mg/kg	Molybdenum mg/kg	Nickel mg/kg	Selenium mg/kg	Silver mg/kg	Thallium mg/kg	Tin mg/kg	Zinc mg/kg
MBSA-Salvelinus malma Walbaum-MUSCLE-Age adult																		
Sample Date	**Fish #**																	
05/27/08	1	19.8	**0.005**	3.80	**0.003**	**0.3**	**0.002**	**0.03**	3.15	0.067	0.118	**0.011**	0.21	1.57	**0.003**	**0.003**	**0.1**	44.4
Mean		19.8	0.005	3.80	0.003	0.3	0.002	0.03	3.15	0.067	0.118	0.011	0.21	1.57	0.003	0.003	0.1	44.4
Median		19.8	0.005	3.80	0.003	0.3	0.002	0.03	3.15	0.067	0.118	0.011	0.21	1.57	0.003	0.003	0.1	44.4
St. Deviation		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
# of values		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Minimum		19.8	0.005	3.80	0.003	0.3	0.002	0.03	3.15	0.067	0.118	0.011	0.21	1.57	0.003	0.003	0.1	44.4
Maximum		19.8	0.005	3.80	0.003	0.3	0.002	0.03	3.15	0.067	0.118	0.011	0.21	1.57	0.003	0.003	0.1	44.4
% of values undetected			100%		100%		100%	100%							100%		100%	
# of values between MDL and MRL						1						1				1		
MIN-Hippoglossus stenolepis-MUSCLE-Age NOT SPEC																		
Sample Date	**Fish #**																	
05/24/08	1	21.8	**0.005**	7.60	**0.0035**	**0.15**	**0.0025**	**0.08**	1.67	0.067	0.269	**0.01**	**0.02**	2.67	**0.0035**	**0.0015**	**0.1**	13.8
05/24/08	2	21.0	**0.005**	4.50	**0.0035**	**0.15**	**0.0025**	**0.035**	1.11	0.054	0.506	**0.011**	1.15	2.51	**0.0035**	**0.0015**	**0.1**	15.5
Mean		21.4	0.005	6.05	0.0035	0.15	0.0025	0.06	1.39	0.061	0.388	0.01	0.6	2.59	0.0035	0.0015	0.1	14.7
Median		21.4	0.005	6.05	0.0035	0.15	0.0025	0.06	1.39	0.061	0.388	0.01	0.6	2.59	0.0035	0.0015	0.1	14.7
St. Deviation		0.6	0	2.19	0	0	0	0.03	0.40	0.009	0.168	0	0.8	0.11	0	0	0	1.2
# of values		2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Minimum		21.0	0.005	4.50	0.0035	0.15	0.0025	0.035	1.11	0.054	0.269	0.01	0.02	2.51	0.0035	0.0015	0.1	13.8
Maximum		21.8	0.005	7.60	0.0035	0.15	0.0025	0.08	1.67	0.067	0.506	0.011	1.15	2.67	0.0035	0.0015	0.1	15.5
% of values undetected			100%		100%	100%	100%	50%					50%		100%	100%	100%	
# of values between MDL and MRL								1				2						
Mouth of Y Valley Creek-Salvelinus malma Walbaum-MUSCLE-Age adult																		
Sample Date	**Fish #**																	
05/26/08	1	21.1	**0.005**	4.20	**0.0035**	**0.9**	**0.007**	**0.08**	3.37	0.068	0.145	**0.014**	**0.09**	1.51	**0.0035**	**0.0015**	**0.2**	43.6
Mean		21.1	0.005	4.20	0.0035	0.9	0.007	0.08	3.37	0.068	0.145	0.014	0.09	1.51	0.0035	0.0015	0.2	43.6
Median		21.1	0.005	4.20	0.0035	0.9	0.007	0.08	3.37	0.068	0.145	0.014	0.09	1.51	0.0035	0.0015	0.2	43.6
St. Deviation		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
# of values		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Minimum		21.1	0.005	4.20	0.0035	0.9	0.007	0.08	3.37	0.068	0.145	0.014	0.09	1.51	0.0035	0.0015	0.2	43.6
Maximum		21.1	0.005	4.20	0.0035	0.9	0.007	0.08	3.37	0.068	0.145	0.014	0.09	1.51	0.0035	0.0015	0.2	43.6
% of values undetected			100%		100%										100%	100%		
# of values between MDL and MRL						1	1	1				1	1				1	
MPS11-Fusitriton oregonensis-WHOLE-Age NOT SPEC																		
Sample Date	**Fish #**																	
08/29/04	1	25.0	0.085	103			23.5		589	1.92	0.572		4.3	4.3	6.89			
Mean		25.0	0.085	103			23.5		589	1.92	0.572		4.3	4.3	6.89			
Median		25.0	0.085	103			23.5		589	1.92	0.572		4.3	4.3	6.89			
St. Deviation		NA	NA	NA			NA		NA	NA	NA		NA	NA	NA			
# of values		1	1	1	0	0	1	0	1	1	1	0	1	1	1	0	0	0
Minimum		25.0	0.085	103			23.5		589	1.92	0.572		4.3	4.3	6.89			
Maximum		25.0	0.085	103			23.5		589	1.92	0.572		4.3	4.3	6.89			
% of values undetected																		
# of values between MDL and MRL																		

Location-Species-Tissue-Age		Total Solids percent	Antimony mg/kg	Arsenic mg/kg	Beryllium mg/kg	Boron mg/kg	Cadmium mg/kg	Chromium mg/kg	Copper mg/kg	Lead mg/kg	Mercury mg/kg	Molybdenum mg/kg	Nickel mg/kg	Selenium mg/kg	Silver mg/kg	Thallium mg/kg	Tin mg/kg	Zinc mg/kg
MPS11-Hexagrammos stelleri-WHOLE-Age NOT SPEC																		
Sample Date	**Fish #**																	
08/29/04	1	23.8	**0.0025**	4.67			0.076		4.97	0.054	0.14		0.85	2.1	0.102			
Mean		23.8	0.0025	4.67			0.076		4.97	0.054	0.14		0.85	2.1	0.102			
Median		23.8	0.0025	4.67			0.076		4.97	0.054	0.14		0.85	2.1	0.102			
St. Deviation		NA	NA	NA			NA		NA	NA	NA		NA	NA	NA			
# of values		1	1	1	0	0	1	0	1	1	1	0	1	1	1	0	0	0
Minimum		23.8	0.0025	4.67			0.076		4.97	0.054	0.14		0.85	2.1	0.102			
Maximum		23.8	0.0025	4.67			0.076		4.97	0.054	0.14		0.85	2.1	0.102			
% of values undetected			100%															
# of values between MDL and MRL																		
MPS11-Leptocottus armatus-WHOLE-Age NOT SPEC																		
Sample Date	**Fish #**																	
08/29/04	1	20.7	**0.007**	3.36			0.023		11.3	0.152	0.0509		2.8	1.8	0.028			
Mean		20.7	0.007	3.36			0.023		11.3	0.152	0.0509		2.8	1.8	0.028			
Median		20.7	0.007	3.36			0.023		11.3	0.152	0.0509		2.8	1.8	0.028			
St. Deviation		NA	NA	NA	NA		NA	NA	NA	NA	NA		NA	NA	NA			
# of values		1	1	1	0	0	1	0	1	1	1	0	1	1	1	0	0	0
Minimum		20.7	0.007	3.36	0	0	0.023	0	11.3	0.152	0.0509		2.8	1.8	0.028			
Maximum		20.7	0.007	3.36	0	0	0.023	0	11.3	0.152	0.0509		2.8	1.8	0.028			
% of values undetected																		
# of values between MDL and MRL			1															
MPS11-Modiolus modiolus-WHOLE-Age NOT SPEC																		
Sample Date	**Fish #**																	
08/29/04	1	21.0	**0.013**	8.72			2.49		67.7	1.5	0.117		6.51	2.6	0.77			
Mean		21.0	0.013	8.72			2.49		67.7	1.5	0.117		6.51	2.6	0.77			
Median		21.0	0.013	8.72			2.49		67.7	1.5	0.117		6.51	2.6	0.77			
St. Deviation		NA	NA	NA			NA		NA	NA	NA		NA	NA	NA			
# of values		1	1	1	0	0	1	0	1	1	1	0	1	1	1	0	0	0
Minimum		21.0	0.013	8.72			2.49		67.7	1.5	0.117		6.51	2.6	0.77			
Maximum		21.0	0.013	8.72			2.49		67.7	1.5	0.117		6.51	2.6	0.77			
% of values undetected																		
# of values between MDL and MRL			1															
MPS11-Neptunea lyrata-WHOLE-Age NOT SPEC																		
Sample Date	**Fish #**																	
08/29/04	1	26.9	**0.048**	13.8			4.55		54.3	0.493	0.211		1.83	2.2	1.15			
Mean		26.9	0.048	13.8			4.55		54.3	0.493	0.211		1.83	2.2	1.15			
Median		26.9	0.048	13.8			4.55		54.3	0.493	0.211		1.83	2.2	1.15			
St. Deviation		NA	NA	NA			NA	NA	NA	NA	NA		NA	NA	NA			
# of values		1	1	1	0	0	1	0	1	1	1	0	1	1	1	0	0	0
Minimum		26.9	0.048	13.8			4.55	0	54.3	0.493	0.211		1.83	2.2	1.15			
Maximum		26.9	0.048	13.8			4.55	0	54.3	0.493	0.211		1.83	2.2	1.15			
% of values undetected																		
# of values between MDL and MRL			1															

Location-Species-Tissue-Age		Total Solids percent	Antimony mg/kg	Arsenic mg/kg	Beryllium mg/kg	Boron mg/kg	Cadmium mg/kg	Chromium mg/kg	Copper mg/kg	Lead mg/kg	Mercury mg/kg	Molybdenum mg/kg	Nickel mg/kg	Selenium mg/kg	Silver mg/kg	Thallium mg/kg	Tin mg/kg	Zinc mg/kg
MPS11-Telmessus cheiragonus-WHOLE-Age NOT SPEC																		
Sample Date	**Fish #**																	
08/29/04	1	14.7	**0.040**	32.5			7.92		127	0.928	0.279		3.43	3.5	1.4			
Mean		14.7	0.040	32.5			7.92		127	0.928	0.279		3.43	3.5	1.4			
Median		14.7	0.040	32.5			7.92		127	0.928	0.279		3.43	3.5	1.4			
St. Deviation		NA	NA	NA			NA		NA	NA	NA		NA	NA	NA			
# of values		1	1	1	0	0	1	0	1	1	1	0	1	1	1	0	0	0
Minimum		14.7	0.040	32.5			7.92		127	0.928	0.279		3.43	3.5	1.4			
Maximum		14.7	0.040	32.5			7.92		127	0.928	0.279		3.43	3.5	1.4			
% of values undetected																		
# of values between MDL and MRL			1															
MPS1B-Clinocardium nuttalli-WHOLE-Age NOT SPEC																		
Sample Date	**Fish #**																	
08/31/04	1	17.7	**0.027**	6.44			0.169		14.9	1.42	0.0236		8.82	2.7	0.037			
Mean		17.7	0.027	6.44			0.169		14.9	1.42	0.0236		8.82	2.7	0.037			
Median		17.7	0.027	6.44			0.169		14.9	1.42	0.0236		8.82	2.7	0.037			
St. Deviation		NA	NA	NA			NA		NA	NA	NA		NA	NA	NA			
# of values		1	1	1	0	0	1	0	1	1	1	0	1	1	1	0	0	0
Minimum		17.7	0.027	6.44			0.169		14.9	1.42	0.0236		8.82	2.7	0.037			
Maximum		17.7	0.027	6.44			0.169		14.9	1.42	0.0236		8.82	2.7	0.037			
% of values undetected																		
# of values between MDL and MRL			1															
MPS1B-Mactromeris polynyma-WHOLE-Age NOT SPEC																		
Sample Date	**Fish #**																	
08/31/04	1	17.2	**0.025**	5.09			0.402		15.3	0.593	0.032		5.54	2.0	0.16			
Mean		17.2	0.025	5.09			0.402		15.3	0.593	0.032		5.54	2.0	0.16			
Median		17.2	0.025	5.09			0.402		15.3	0.593	0.032		5.54	2.0	0.16			
St. Deviation		NA	NA	NA			NA		NA	NA	NA		NA	NA	NA			
# of values		1	1	1	0	0	1	0	1	1	1	0	1	1	1	0	0	0
Minimum		17.2	0.025	5.09			0.402		15.3	0.593	0.032		5.54	2.0	0.16			
Maximum		17.2	0.025	5.09			0.402		15.3	0.593	0.032		5.54	2.0	0.16			
% of values undetected																		
# of values between MDL and MRL			1															
MPS1B-Mytilus trossulus-WHOLE-Age not spec																		
Sample Date	**Fish #**																	
09/17/08	1	14.1	**0.039**	8.56	0.041	30	2.95	8.24	8.29	0.785	0.0837	0.540	4.71	2.05	0.046	0.023	**0.5**	57.6
Mean		14.1	0.039	8.56	0.041	30	2.95	8.24	8.29	0.785	0.0837	0.540	4.71	2.05	0.046	0.023	0.5	57.6
Median		14.1	0.039	8.56	0.041	30	2.95	8.24	8.29	0.785	0.0837	0.540	4.71	2.05	0.046	0.023	0.5	57.6
St. Deviation		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
# of values		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Minimum		14.1	0.039	8.56	0.041	30	2.95	8.24	8.29	0.785	0.0837	0.540	4.71	2.05	0.046	0.023	0.5	57.6
Maximum		14.1	0.039	8.56	0.041	30	2.95	8.24	8.29	0.785	0.0837	0.540	4.71	2.05	0.046	0.023	0.5	57.6
% of values undetected																		
# of values between MDL and MRL			1														1	

Location-Species-Tissue-Age		Total Solids percent	Antimony mg/kg	Arsenic mg/kg	Beryllium mg/kg	Boron mg/kg	Cadmium mg/kg	Chromium mg/kg	Copper mg/kg	Lead mg/kg	Mercury mg/kg	Molybdenum mg/kg	Nickel mg/kg	Selenium mg/kg	Silver mg/kg	Thallium mg/kg	Tin mg/kg	Zinc mg/kg
MPS1C-Salvelinus malma Walbaum-WHOLE-Age NOT SPEC																		
Sample Date	**Fish #**																	
07/21/05	1	23.1	**0.004**	3.56	**0.0015**		0.038	4.2	12.4	0.53	0.0529	0.07	8.33	2.0	0.045	**0.01**		57.5
Mean		23.1	0.004	3.56	0.0015		0.038	4.2	12.4	0.53	0.0529	0.07	8.33	2.0	0.045	0.01		57.5
Median		23.1	0.004	3.56	0.0015		0.038	4.2	12.4	0.53	0.0529	0.07	8.33	2.0	0.045	0.01		57.5
St. Deviation		NA	NA	NA	NA		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		NA
# of values		1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	0	1
Minimum		23.1	0.004	3.56	0.0015		0.038	4.2	12.4	0.53	0.0529	0.07	8.33	2.0	0.045	0.01		57.5
Maximum		23.1	0.004	3.56	0.0015		0.038	4.2	12.4	0.53	0.0529	0.07	8.33	2.0	0.045	0.01		57.5
% of values undetected			100%		100%											100%		
# of values between MDL and MRL																		
MPS1-Hippoglossus stenolepis-MUSCLE-Age NOT SPEC																		
Sample Date	**Fish #**																	
05/25/08	1	21.1	**0.005**	10.2	**0.003**	**0.15**	**0.002**	**0.08**	1.08	0.044	0.350	**0.011**	**0.02**	2.50	**0.003**	**0.0015**	**0.1**	14.7
05/25/08	2	21.4	**0.005**	9.20	**0.0035**	**0.3**	**0.0025**	**0.035**	1.22	0.068	0.388	**0.008**	**0.02**	2.19	**0.0035**	**0.0015**	**0.1**	14.4
Mean		21.3	0.005	9.70	0.003	0.2	0.002	0.06	1.15	0.056	0.369	0.01	0.02	2.35	0.003	0.0015	0.1	14.6
Median		21.3	0.005	9.70	0.003	0.2	0.002	0.06	1.15	0.056	0.369	0.01	0.02	2.35	0.003	0.0015	0.1	14.6
St. Deviation		0.2	0	0.70	0	0.1	0	0.03	0.10	0.017	0.027	0	0	0.22	0	0	0	0.2
# of values		2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Minimum		21.1	0.005	9.20	0.003	0.15	0.002	0.035	1.08	0.044	0.350	0.008	0.02	2.19	0.003	0.0015	0.1	14.4
Maximum		21.4	0.005	10.2	0.0035	0.3	0.0025	0.08	1.22	0.068	0.388	0.011	0.02	2.50	0.0035	0.0015	0.1	14.7
% of values undetected			100%		100%	50%	100%	50%					100%		100%	100%	100%	
# of values between MDL and MRL						1		1				2						
MPS1M-Mytilus trossulus-WHOLE-Age NOT SPEC																		
Sample Date	**Fish #**																	
08/29/04	1	15.1	**0.019**	8.98			2.99		11.3	0.493	0.08		3.81	4.0	0.047			
Mean		15.1	0.019	8.98			2.99		11.3	0.493	0.08		3.81	4.0	0.047			
Median		15.1	0.019	8.98			2.99		11.3	0.493	0.08		3.81	4.0	0.047			
St. Deviation		NA	NA	NA			NA		NA	NA	NA		NA	NA	NA			
# of values		1	1	1	0	0	1	0	1	1	1	0	1	1	1	0	0	0
Minimum		15.1	0.019	8.98			2.99		11.3	0.493	0.08		3.81	4.0	0.047			
Maximum		15.1	0.019	8.98			2.99		11.3	0.493	0.08		3.81	4.0	0.047			
% of values undetected																		
# of values between MDL and MRL			1															
MPS1-Mytilus trossulus-WHOLE-Age NOT SPEC																		
Sample Date	**Fish #**																	
05/26/08	1	16.6	**0.020**	11.4	0.026	28	2.68	2.74	13.1	0.803	0.115	0.539	2.97	3.52	0.030	0.022	**0.1**	80.5
05/26/08	2	15.8	**0.020**	11.4	0.019	27	2.65	3.01	10.6	0.701	0.125	0.576	2.64	3.52	0.025	**0.018**	**0.2**	72.1
07/19/08	1	13.6	**0.022**	9.52	**0.016**	38.1	2.78	2.11	7.78	0.540	0.0773	0.423	2.30	2.30	0.047	0.017	**0.02**	51.8
Mean		15.3	0.021	10.8	0.020	31	2.7	2.62	10.5	0.681	0.106	0.513	2.64	3.11	0.034	0.019	0.11	68.1
Median		15.8	0.020	11.4	0.019	28	2.68	2.74	10.6	0.701	0.115	0.539	2.64	3.52	0.030	0.018	0.1	72.1
St. Deviation		1.6	0.001	1.10	0.005	6	0.07	0.46	2.70	0.133	0.025	0.080	0.34	0.70	0.012	0.003	0.09	14.8
# of values		3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Minimum		13.6	0.020	9.52	0.016	27	2.65	2.11	7.78	0.540	0.0773	0.423	2.30	2.30	0.025	0.017	0.02	51.8
Maximum		16.6	0.022	11.4	0.026	38.1	2.78	3.01	13.1	0.803	0.125	0.576	2.97	3.52	0.047	0.022	0.2	80.5
% of values undetected																	67%	
# of values between MDL and MRL			3		1											1	1	

Location-Species-Tissue-Age		Total Solids percent	Antimony mg/kg	Arsenic mg/kg	Beryllium mg/kg	Boron mg/kg	Cadmium mg/kg	Chromium mg/kg	Copper mg/kg	Lead mg/kg	Mercury mg/kg	Molybdenum mg/kg	Nickel mg/kg	Selenium mg/kg	Silver mg/kg	Thallium mg/kg	Tin mg/kg	Zinc mg/kg
MPS21-Cottidae sp.-WHOLE-Age NOT SPEC																		
Sample Date	**Fish #**																	
08/27/04	1	21.1	**0.009**	7.34			0.06		6.22	0.125	0.13		1.16	2.2	0.026			
Mean		21.1	0.009	7.34			0.06		6.22	0.125	0.13		1.16	2.2	0.026			
Median		21.1	0.009	7.34			0.06		6.22	0.125	0.13		1.16	2.2	0.026			
St. Deviation		NA	NA	NA			NA		NA	NA	NA		NA	NA	NA			
# of values		1	1	1	0	0	1	0	1	1	1	0	1	1	1	0	0	0
Minimum		21.1	0.009	7.34			0.06		6.22	0.125	0.13		1.16	2.2	0.026			
Maximum		21.1	0.009	7.34			0.06		6.22	0.125	0.13		1.16	2.2	0.026			
% of values undetected																		
# of values between MDL and MRL			1															
MPS21-Hyas lyratus-WHOLE-Age NOT SPEC																		
Sample Date	**Fish #**																	
08/28/04	1	12.2	**0.041**	18.0			5.35		119	0.534	0.114		3.78	3.1	1.61			
Mean		12.2	0.041	18.0			5.35		119	0.534	0.114		3.78	3.1	1.61			
Median		12.2	0.041	18.0			5.35		119	0.534	0.114		3.78	3.1	1.61			
St. Deviation		NA	NA	NA			NA		NA	NA	NA		NA	NA	NA			
# of values		1	1	1	0	0	1	0	1	1	1	0	1	1	1	0	0	0
Minimum		12.2	0.041	18.0			5.35		119	0.534	0.114		3.78	3.1	1.61			
Maximum		12.2	0.041	18.0			5.35		119	0.534	0.114		3.78	3.1	1.61			
% of values undetected																		
# of values between MDL and MRL			1															
MPS21-Telmessus cheiragonus-WHOLE-Age NOT SPEC																		
Sample Date	**Fish #**																	
08/28/04	1	22.6	**0.015**	9.49			3.87		123	0.095	0.0431		1.67	2.3	0.961			
Mean		22.6	0.015	9.49			3.87		123	0.095	0.0431		1.67	2.3	0.961			
Median		22.6	0.015	9.49			3.87		123	0.095	0.0431		1.67	2.3	0.961			
St. Deviation		NA	NA	NA			NA		NA	NA	NA		NA	NA	NA			
# of values		1	1	1	0	0	1	0	1	1	1	0	1	1	1	0	0	0
Minimum		22.6	0.015	9.49			3.87		123	0.095	0.0431		1.67	2.3	0.961			
Maximum		22.6	0.015	9.49			3.87		123	0.095	0.0431		1.67	2.3	0.961			
% of values undetected																		
# of values between MDL and MRL			1															
MPS2-Mytilus trossulus-WHOLE-Age not spec																		
Sample Date	**Fish #**																	
08/27/04	1	21.0	**0.019**	8.63			2.30		12.7	0.636	0.0674		3.85	3.4	0.04			
07/15/08	1	11.7	**0.027**	9.10	0.028	47	2.18	4.63	10.9	0.694	0.0825	0.472	3.87	2.4	0.096	0.021	0.11	56.1
Mean		16.4	0.023	8.87	0.028	47	2.24	4.63	11.8	0.665	0.0750	0.472	3.86	2.9	0.07	0.021	0.11	56.1
Median		16.4	0.023	8.87	0.028	47	2.24	4.63	11.8	0.665	0.0750	0.472	3.86	2.9	0.07	0.021	0.11	56.1
St. Deviation		6.6	0.006	0.33	NA	NA	0.08	NA	1.30	0.041	0.0107	NA	0.01	0.7	0.04	NA	NA	NA
# of values		2	2	2	1	1	2	1	2	2	2	1	2	2	2	1	1	1
Minimum		11.7	0.019	8.63	0.028	47	2.18	4.63	10.9	0.636	0.0674	0.472	3.85	2.4	0.04	0.021	0.11	56.1
Maximum		21.0	0.027	9.10	0.028	47	2.30	4.63	12.7	0.694	0.0825	0.472	3.87	3.4	0.096	0.021	0.11	56.1
% of values undetected																		
# of values between MDL and MRL			2															

Location-Species-Tissue-Age		Total Solids percent	Antimony mg/kg	Arsenic mg/kg	Beryllium mg/kg	Boron mg/kg	Cadmium mg/kg	Chromium mg/kg	Copper mg/kg	Lead mg/kg	Mercury mg/kg	Molybdenum mg/kg	Nickel mg/kg	Selenium mg/kg	Silver mg/kg	Thallium mg/kg	Tin mg/kg	Zinc mg/kg
MPS2TA-Hippoglossus stenolepis-MUSCLE-Age not spec																		
Sample Date	**Fish #**																	
06/16/08	6	22.3	**0.004**	6.78	**0.0035**	**0.15**	**0.0025**	**0.035**	2.12	0.029	0.380	0.012	0.14	3.26	0.032	**0.0015**	0.2	17.9
06/16/08	7	23.1	**0.0035**	3.69	**0.003**	**0.15**	0.005	0.18	3.73	0.130	0.988	0.013	0.68	2.54	0.016	**0.0015**	0.5	18.9
Mean		22.7	0.004	5.24	0.003	0.15	0.004	0.11	2.93	0.080	0.684	0.013	0.41	2.90	0.024	0.0015	0.35	18.4
Median		22.7	0.004	5.24	0.003	0.15	0.004	0.11	2.93	0.080	0.684	0.013	0.41	2.90	0.024	0.0015	0.35	18.4
St. Deviation		0.6	0	2.18	0	0	0.002	0.1	1.14	0.071	0.430	0.001	0.38	0.51	0.011	0	0.21	0.7
# of values		2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Minimum		22.3	0.0035	3.69	0.003	0.15	0.0025	0.035	2.12	0.029	0.380	0.012	0.14	2.54	0.016	0.0015	0.2	17.9
Maximum		23.1	0.004	6.78	0.0035	0.15	0.005	0.18	3.73	0.130	0.988	0.013	0.68	3.26	0.032	0.0015	0.5	18.9
% of values undetected			100%		100%	100%	50%	50%								100%		
# of values between MDL and MRL							1	1				2	1		1		2	
MPS2TA-Limanda aspera-WHOLE-Age NOT SPEC																		
Sample Date	**Fish #**																	
07/20/05	1	24.0	**0.004**	3.81	**0.0015**		0.112	1.4	8.6	0.1	0.047	0.06	4.36	1.67	0.968	**0.001**		45.6
Mean		24.0	0.004	3.81	0.0015		0.112	1.4	8.6	0.1	0.047	0.06	4.36	1.67	0.968	0.001		45.6
Median		24.0	0.004	3.81	0.0015		0.112	1.4	8.6	0.1	0.047	0.06	4.36	1.67	0.968	0.001		45.6
St. Deviation		NA	NA	NA	NA		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		NA
# of values		1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	0	1
Minimum		24.0	0.004	3.81	0.0015		0.112	1.4	8.6	0.1	0.047	0.06	4.36	1.67	0.968	0.001		45.6
Maximum		24.0	0.004	3.81	0.0015		0.112	1.4	8.6	0.1	0.047	0.06	4.36	1.67	0.968	0.001		45.6
% of values undetected			100%		100%											100%		
# of values between MDL and MRL																		
MPS31-Oncorhynchus keta-LIVER-Age NOT SPEC																		
Sample Date	**Fish #**																	
08/30/04	1	24.8	0.008	1.56			4.25		273	0.115	0.0886		0.1	9.9	5.85			
Mean		24.8	0.008	1.56			4.25		273	0.115	0.0886		0.1	9.9	5.85			
Median		24.8	0.008	1.56			4.25		273	0.115	0.0886		0.1	9.9	5.85			
St. Deviation		NA	NA	NA			NA		NA	NA	NA	NA	NA	NA	NA			
# of values		1	1	1	0	0	1	0	1	1	1	0	1	1	1	0	0	0
Minimum		24.8	0.008	1.56			4.25		273	0.115	0.0886		0.1	9.9	5.85			
Maximum		24.8	0.008	1.56			4.25		273	0.115	0.0886		0.1	9.9	5.85			
% of values undetected																		
# of values between MDL and MRL			1										1					
MPS3-Clinocardium nuttalli-WHOLE-Age NOT SPEC																		
Sample Date	**Fish #**																	
08/31/04	1	13.7	0.023	6.70			0.168		6.56	0.622	0.0755		11.1	2.1	0.059			
Mean		13.7	0.023	6.70			0.168		6.56	0.622	0.0755		11.1	2.1	0.059			
Median		13.7	0.023	6.70			0.168		6.56	0.622	0.0755		11.1	2.1	0.059			
St. Deviation		NA	NA	NA			NA		NA	NA	NA		NA	NA	NA			
# of values		1	1	1	0	0	1	0	1	1	1	0	1	1	1	0	0	0
Minimum		13.7	0.023	6.70			0.168		6.56	0.622	0.0755		11.1	2.1	0.059			
Maximum		13.7	0.023	6.70			0.168		6.56	0.622	0.0755		11.1	2.1	0.059			
% of values undetected																		
# of values between MDL and MRL			1															

Location-Species-Tissue-Age		Total Solids percent	Antimony mg/kg	Arsenic mg/kg	Beryllium mg/kg	Boron mg/kg	Cadmium mg/kg	Chromium mg/kg	Copper mg/kg	Lead mg/kg	Mercury mg/kg	Molybdenum mg/kg	Nickel mg/kg	Selenium mg/kg	Silver mg/kg	Thallium mg/kg	Tin mg/kg	Zinc mg/kg
MPS3-Mytilus trossulus-WHOLE-Age NOT SPEC																		
Sample Date	**Fish #**																	
08/31/04	1	13.4	**0.020**	8.02			2.11		9.66	0.685	0.0643		3.48	2.6	0.047			
07/12/08	1	20.4	**0.022**	9.95	0.019	34.6	2.37	4.02	27.1	1.11	0.0665	0.430	14.0	2.4	0.152	**0.016**	0.29	61.3
Mean		16.9	0.02	8.99	0.019	34.6	2.24	4.02	18.4	0.90	0.0654	0.430	8.7	2.5	0.100	0.016	0.29	61.3
Median		16.9	0.02	8.99	0.019	34.6	2.24	4.02	18.4	0.90	0.0654	0.430	8.7	2.5	0.100	0.016	0.29	61.3
St. Deviation		4.9	0	1.36	NA	NA	0.18	NA	12.3	0.30	0.0016	NA	7.4	0.1	0.074	NA	NA	NA
# of values		2	2	2	1	1	2	1	2	2	2	1	2	2	2	1	1	1
Minimum		13.4	0.02	8.02	0.019	34.6	2.11	4.02	9.66	0.685	0.0643	0.430	3.48	2.4	0.047	0.016	0.29	61.3
Maximum		20.4	0.022	9.95	0.019	34.6	2.37	4.02	27.1	1.11	0.0665	0.430	14	2.6	0.152	0.016	0.29	61.3
% of values undetected																		
# of values between MDL and MRL			2													1		
MPS3-Oncorhynchus keta-MUSCLE-Age NOT SPEC																		
Sample Date	**Fish #**																	
08/30/04	1	24.0	**0.0025**	0.69			**0.01**		3.54	**0.007**	0.108		0.41	1.4	**0.002**			
Mean		24.0	0.0025	0.69			0.01		3.54	0.007	0.108		0.41	1.4	0.002			
Median		24.0	0.0025	0.69			0.01		3.54	0.007	0.108		0.41	1.4	0.002			
St. Deviation		NA	NA	NA			NA		NA	NA	NA		NA	NA	NA			
# of values		1	1	1	0	0	1	0	1	1	1	0	1	1	1	0	0	0
Minimum		24.0	0.0025	0.69			0.01		3.54	0.007	0.108		0.41	1.4	0.002			
Maximum		24.0	0.0025	0.69			0.01		3.54	0.007	0.108		0.41	1.4	0.002			
% of values undetected			100%												100%			
# of values between MDL and MRL							1			1								
MPS4-Hexagrammos stelleri-WHOLE-Age NOT SPEC																		
Sample Date	**Fish #**																	
07/17/05	1	23.1	**0.004**	4.55	**0.0015**		0.033	1.6	9.8	0.09	0.0657	0.06	5.19	2.14	0.177	**0.001**		55.8
Mean		23.1	0.004	4.55	0.0015		0.033	1.6	9.8	0.09	0.0657	0.06	5.19	2.14	0.177	0.001		55.8
Median		23.1	0.004	4.55	0.0015		0.033	1.6	9.8	0.09	0.0657	0.06	5.19	2.14	0.177	0.001		55.8
St. Deviation		NA	NA	NA	NA		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		NA
# of values		1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	0	1
Minimum		23.1	0.004	4.55	0.0015		0.033	1.6	9.8	0.09	0.0657	0.06	5.19	2.14	0.177	0.001		55.8
Maximum		23.1	0.004	4.55	0.0015		0.033	1.6	9.8	0.09	0.0657	0.06	5.19	2.14	0.177	0.001		55.8
% of values undetected			100%		100%											100%		
# of values between MDL and MRL																		
MPS4-Hippoglossus stenolepis-MUSCLE-Age NOT SPEC																		
Sample Date	**Fish #**																	
05/27/08	1	22.2	**0.005**	6.20	**0.003**	**0.4**	**0.002**	**0.08**	1.00	0.043	0.321	**0.0035**	0.51	2.64	**0.003**	**0.0015**	**0.1**	13.1
05/27/08	2	21.3	**0.005**	5.30	**0.0035**	**0.4**	**0.0025**	**0.035**	1.25	0.053	0.284	**0.031**	0.36	2.36	**0.0035**	**0.0015**	**0.1**	13.4
05/27/08	3	19.5	**0.020**	3.30	**0.0035**	**0.4**	**0.0025**	**0.035**	1.37	0.072	0.481	**0.022**	**0.02**	3.16	**0.0035**	**0.004**	**0.1**	14.3
Mean		21.0	0.010	4.93	0.0033	0.4	0.0023	0.050	1.21	0.056	0.362	0.019	0.30	2.72	0.0033	0.0023	0.1	13.6
Median		21.3	0.005	5.30	0.0035	0.4	0.0025	0.035	1.25	0.053	0.321	0.022	0.36	2.64	0.0035	0.0015	0.1	13.4
St. Deviation		1.4	0.009	1.48	0.0003	0	0.0003	0.026	0.19	0.015	0.105	0.014	0.25	0.41	0.0003	0.0014	0	0.6
# of values		3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Minimum		19.5	0.005	3.30	0.003	0.4	0.002	0.035	1.00	0.043	0.284	0.0035	0.02	2.36	0.003	0.0015	0.1	13.1
Maximum		22.2	0.020	6.20	0.0035	0.4	0.0025	0.08	1.37	0.072	0.481	0.031	0.51	3.16	0.0035	0.004	0.1	14.3
% of values undetected			67%		100%		100%	67%				33%	33%		100%	67%	100%	
# of values between MDL and MRL			1			3		1				2				1		

Location-Species-Tissue-Age		Total Solids percent	Antimony mg/kg	Arsenic mg/kg	Beryllium mg/kg	Boron mg/kg	Cadmium mg/kg	Chromium mg/kg	Copper mg/kg	Lead mg/kg	Mercury mg/kg	Molybdenum mg/kg	Nickel mg/kg	Selenium mg/kg	Silver mg/kg	Thallium mg/kg	Tin mg/kg	Zinc mg/kg
MPS4L-Macoma obliqua-WHOLE-Age NOT SPEC																		
Sample Date	**Fish #**																	
08/30/04	1	16.1	0.083	17.0			0.187		35.9	2.73	0.126		10.5	3.6	0.25			
Mean		16.1	0.083	17.0			0.187		35.9	2.73	0.126		10.5	3.6	0.25			
Median		16.1	0.083	17.0			0.187		35.9	2.73	0.126		10.5	3.6	0.25			
St. Deviation		NA	NA	NA			NA		NA	NA	NA		NA	NA	NA			
# of values		1	1	1	0	0	1	0	1	1	1	0	1	1	1	0	0	0
Minimum		16.1	0.083	17.0			0.187		35.9	2.73	0.126		10.5	3.6	0.25			
Maximum		16.1	0.083	17.0			0.187		35.9	2.73	0.126		10.5	3.6	0.25			
% of values undetected																		
# of values between MDL and MRL																		
MPS4M-Mytilus trossulus-WHOLE-Age NOT SPEC																		
Sample Date	**Fish #**																	
08/30/04	1	15.6	**0.014**	7.67			2.2		7.44	0.478	0.0834		2.56	3.0	0.047			
Mean		15.6	0.014	7.67			2.2		7.44	0.478	0.0834		2.56	3.0	0.047			
Median		15.6	0.014	7.67			2.2		7.44	0.478	0.0834		2.56	3.0	0.047			
St. Deviation		NA	NA	NA			NA		NA	NA	NA		NA	NA	NA			
# of values		1	1	1	0	0	1	0	1	1	1	0	1	1	1	0	0	0
Minimum		15.6	0.014	7.67			2.2		7.44	0.478	0.0834		2.56	3.0	0.047			
Maximum		15.6	0.014	7.67			2.2		7.44	0.478	0.0834		2.56	3.0	0.047			
% of values undetected																		
# of values between MDL and MRL			1															
MPS4-Mytilus trossulus-WHOLE-Age not spec																		
Sample Date	**Fish #**																	
05/25/08	1	18.9	**0.020**	9.90	**0.018**	27	2.41	2.69	10.4	0.735	0.107	0.514	2.86	3.22	0.027	**0.015**	**0.1**	91.8
05/25/08	2	17.6	**0.020**	10.7	**0.018**	30	2.47	4.08	11.6	0.623	0.106	0.551	3.89	2.92	0.034	**0.015**	**0.1**	88.5
07/12/08	1	17.7	**0.028**	8.81	**0.016**	27.9	2.95	4.12	23.1	0.732	0.0916	0.461	11.8	2.3	0.058	**0.016**	0.24	56.2
09/16/08	1	16.1	**0.026**	9.00	**0.012**	22	2.67	2.18	6.89	0.425	0.0902	0.405	1.99	1.78	0.042	0.026	**0.4**	63.5
Mean		17.6	0.024	9.60	0.016	27	2.63	3.27	13.0	0.629	0.0987	0.483	5.14	2.56	0.040	0.018	0.21	75.0
Median		17.7	0.023	9.45	0.017	27	2.57	3.39	11.0	0.678	0.0988	0.488	3.38	2.61	0.038	0.016	0.17	76.0
St. Deviation		1.1	0.004	0.87	0.003	3	0.24	0.98	7.00	0.145	0.0090	0.064	4.51	0.64	0.013	0.005	0.14	17.8
# of values		4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Minimum		16.1	0.020	8.81	0.012	22	2.41	2.18	6.89	0.425	0.0902	0.405	1.99	1.78	0.027	0.015	0.1	56.2
Maximum		18.9	0.028	10.7	0.018	30	2.95	4.12	23.1	0.735	0.107	0.551	11.8	3.22	0.058	0.026	0.4	91.8
% of values undetected																	50%	
# of values between MDL and MRL			4		4											3	1	
MPSE-Mya arenaria-WHOLE-Age NOT SPEC																		
Sample Date	**Fish #**																	
08/31/04	1	10.8	0.083	47.7			0.285		19.2	2.55	0.042		8.53	2.9	0.127			
Mean		10.8	0.083	47.7			0.285		19.2	2.55	0.042		8.53	2.9	0.127			
Median		10.8	0.083	47.7			0.285		19.2	2.55	0.042		8.53	2.9	0.127			
St. Deviation		NA	NA	NA			NA		NA	NA	NA		NA	NA	NA			
# of values		1	1	1	0	0	1	0	1	1	1	0	1	1	1	0	0	0
Minimum		10.8	0.083	47.7			0.285		19.2	2.55	0.042		8.53	2.9	0.127			
Maximum		10.8	0.083	47.7			0.285		19.2	2.55	0.042		8.53	2.9	0.127			
% of values undetected																		
# of values between MDL and MRL																		

Location-Species-Tissue-Age		Total Solids percent	Antimony mg/kg	Arsenic mg/kg	Beryllium mg/kg	Boron mg/kg	Cadmium mg/kg	Chromium mg/kg	Copper mg/kg	Lead mg/kg	Mercury mg/kg	Molybdenum mg/kg	Nickel mg/kg	Selenium mg/kg	Silver mg/kg	Thallium mg/kg	Tin mg/kg	Zinc mg/kg
MPSE-Pleuronectidae family-WHOLE-Age NOT SPEC																		
Sample Date	**Fish #**																	
08/17/05	1	19.1	**0.004**	6.08	**0.003**		**0.011**	**0.15**	3.3	0.05	0.0695	**0.025**	1.19	**0.6**	**0.01**	**0.004**		56.5
Mean		19.1	0.004	6.08	0.003		0.011	0.15	3.3	0.05	0.0695	0.025	1.19	0.6	0.01	0.004		56.5
Median		19.1	0.004	6.08	0.003		0.011	0.15	3.3	0.05	0.0695	0.025	1.19	0.6	0.01	0.004		56.5
St. Deviation		NA	NA	NA	NA		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		NA
# of values		1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	0	1
Minimum		19.1	0.004	6.08	0.003		0.011	0.15	3.3	0.05	0.0695	0.025	1.19	0.6	0.01	0.004		56.5
Maximum		19.1	0.004	6.08	0.003		0.011	0.15	3.3	0.05	0.0695	0.025	1.19	0.6	0.01	0.004		56.5
% of values undetected			100%					100%				100%			100%			
# of values between MDL and MRL					1		1							1		1		
MTR03-Hexagrammos sp.-WHOLE-Age NOT SPEC																		
Sample Date	**Fish #**																	
08/17/05	1	22.1	**0.004**	2.79	**0.0015**		**0.015**	**0.15**	3.0	0.03	0.0439	**0.025**	0.72	**0.7**	**0.01**	**0.002**		40.8
Mean		22.1	0.004	2.79	0.0015		0.015	0.15	3.0	0.03	0.0439	0.025	0.72	0.7	0.01	0.002		40.8
Median		22.1	0.004	2.79	0.0015		0.015	0.15	3.0	0.03	0.0439	0.025	0.72	0.7	0.01	0.002		40.8
St. Deviation		NA	NA	NA	NA		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		NA
# of values		1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	0	1
Minimum		22.1	0.004	2.79	0.0015		0.015	0.15	3.0	0.03	0.0439	0.025	0.72	0.7	0.01	0.002		40.8
Maximum		22.1	0.004	2.79	0.0015		0.015	0.15	3.0	0.03	0.0439	0.025	0.72	0.7	0.01	0.002		40.8
% of values undetected			100%		100%			100%				100%			100%			
# of values between MDL and MRL							1							1		1		
MTR1A-Hexagrammos stelleri-WHOLE-Age NOT SPEC																		
Sample Date	**Fish #**																	
05/10/05	1	23.2	0.049	6.14	**0.0015**		0.072	2.0	18.7	0.17	0.252	0.07	7.21	1.4	0.066	**0.002**		55.5
Mean		23.2	0.049	6.14	0.0015		0.072	2.0	18.7	0.17	0.252	0.07	7.21	1.4	0.066	0.002		55.5
Median		23.2	0.049	6.14	0.0015		0.072	2.0	18.7	0.17	0.252	0.07	7.21	1.4	0.066	0.002		55.5
St. Deviation		NA	NA	NA	NA		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		NA
# of values		1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	0	1
Minimum		23.2	0.049	6.14	0.0015		0.072	2.0	18.7	0.17	0.252	0.07	7.21	1.4	0.066	0.002		55.5
Maximum		23.2	0.049	6.14	0.0015		0.072	2.0	18.7	0.17	0.252	0.07	7.21	1.4	0.066	0.002		55.5
% of values undetected					100%													
# of values between MDL and MRL																1		
MTR2-Hippoglossus stenolepis-MUSCLE-Age not spec																		
Sample Date	**Fish #**																	
06/17/08	8	21.4	**0.0035**	20.8	**0.003**	**0.1**	**0.002**	**0.03**	2.35	0.066	0.252	**0.008**	1.27	5.27	**0.003**	**0.001**	**0.3**	16.1
06/17/08	9	22.4	**0.004**	6.08	**0.0035**	**0.15**	**0.0025**	**0.035**	1.54	0.028	0.349	**0.01**	**0.15**	2.86	**0.009**	**0.0015**	**0.1**	17.7
06/17/08	10	22.6	**0.004**	7.01	**0.0035**	**0.15**	**0.0025**	**0.035**	1.74	0.026	0.296	**0.015**	**0.17**	2.92	**0.0035**	**0.0015**	**0.2**	17.0
06/17/08	11	22.7	**0.0035**	6.38	**0.003**	**0.15**	**0.005**	**0.03**	2.60	0.058	0.408	**0.015**	0.40	2.70	**0.003**	**0.0015**	**0.4**	18.4
06/17/08	12	22.0	**0.004**	10.1	**0.0035**	**0.15**	**0.0025**	**0.035**	8.16	0.029	0.281	**0.015**	0.30	3.52	**0.0035**	**0.0015**	**0.3**	18.2
Mean		22.2	0.004	10.1	0.0033	0.14	0.0029	0.033	3.28	0.041	0.317	0.013	0.46	3.45	0.0044	0.0014	0.3	17.5
Median		22.4	0.004	7.01	0.0035	0.15	0.0025	0.035	2.35	0.029	0.296	0.015	0.30	2.92	0.0035	0.0015	0.3	17.7
St. Deviation		0.5	0	6.21	0.0003	0.02	0.0012	0.003	2.76	0.019	0.062	0.003	0.47	1.06	0.0026	0.0002	0.1	0.9
# of values		5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Minimum		21.4	0.0035	6.08	0.003	0.1	0.002	0.03	1.54	0.026	0.252	0.008	0.15	2.70	0.003	0.001	0.1	16.1
Maximum		22.7	0.004	20.8	0.0035	0.15	0.005	0.035	8.16	0.066	0.408	0.015	1.27	5.27	0.009	0.0015	0.4	18.4
% of values undetected			100%		100%	100%	80%	100%							80%	100%	20%	
# of values between MDL and MRL							1					5	2		1		4	

Location-Species-Tissue-Age		Total Solids percent	Antimony mg/kg	Arsenic mg/kg	Beryllium mg/kg	Boron mg/kg	Cadmium mg/kg	Chromium mg/kg	Copper mg/kg	Lead mg/kg	Mercury mg/kg	Molybdenum mg/kg	Nickel mg/kg	Selenium mg/kg	Silver mg/kg	Thallium mg/kg	Tin mg/kg	Zinc mg/kg
MYVCM-Oncorhynchus gorbuscha-MUSCLE-Age ADULT																		
Sample Date	**Fish #**																	
07/17/08	2	24.7	0.025	1.49	**0.0035**	0.569	0.009	0.23	2.17	0.017	0.136	0.017	0.17	0.5	**0.01**	0.004	0.06	12.6
Mean		24.7	0.025	1.49	0.0035	0.569	0.009	0.23	2.17	0.017	0.136	0.017	0.17	0.5	0.01	0.004	0.06	12.6
Median		24.7	0.025	1.49	0.0035	0.569	0.009	0.23	2.17	0.017	0.136	0.017	0.17	0.5	0.01	0.004	0.06	12.6
St. Deviation		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
# of values		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Minimum		24.7	0.025	1.49	0.0035	0.569	0.009	0.23	2.17	0.017	0.136	0.017	0.17	0.5	0.01	0.004	0.06	12.6
Maximum		24.7	0.025	1.49	0.0035	0.569	0.009	0.23	2.17	0.017	0.136	0.017	0.17	0.5	0.01	0.004	0.06	12.6
% of values undetected					100%										100%			
# of values between MDL and MRL			1				1	1		1		1	1	1		1		
MYVCM-Oncorhynchus keta-MUSCLE-Age ADULT																		
Sample Date	**Fish #**																	
07/17/08	1	27.2	**0.004**	0.86	**0.0035**	0.398	0.006	**0.035**	1.52	**0.002**	0.175	**0.004**	0.04	0.8	**0.0095**	**0.0015**	**0.025**	12.6
Mean		27.2	0.004	0.86	0.0035	0.398	0.006	0.035	1.52	0.002	0.175	0.004	0.04	0.8	0.0095	0.0015	0.025	12.6
Median		27.2	0.004	0.86	0.0035	0.398	0.006	0.035	1.52	0.002	0.175	0.004	0.04	0.8	0.0095	0.0015	0.025	12.6
St. Deviation		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
# of values		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Minimum		27.2	0.004	0.86	0.0035	0.398	0.006	0.035	1.52	0.002	0.175	0.004	0.04	0.8	0.0095	0.0015	0.025	12.6
Maximum		27.2	0.004	0.86	0.0035	0.398	0.006	0.035	1.52	0.002	0.175	0.004	0.04	0.8	0.0095	0.0015	0.025	12.6
% of values undetected			100%		100%			100%		100%		100%			100%	100%	100%	
# of values between MDL and MRL							1						1	1				
MYVCM-Salvelinus malma Walbaum-MUSCLE-Age ADULT																		
Sample Date	**Fish #**																	
06/16/08	1	21.7	**0.0035**	6.92	**0.003**	0.3	**0.002**	0.16	5.93	0.684	0.0675	0.009	0.27	1.99	0.024	**0.0015**	0.3	38.9
06/16/08	2	21.8	**0.004**	4.56	**0.0035**	**0.15**	**0.0025**	0.07	3.87	0.124	0.0550	0.008	0.16	1.99	0.012	**0.0015**	0.2	40.8
06/16/08	3	20.8	**0.004**	4.98	**0.0035**	0.3	**0.0025**	0.28	4.41	0.188	0.118	0.016	0.32	2.08	**0.0035**	**0.0015**	0.4	53.0
06/16/08	4	20.0	**0.004**	4.45	**0.0035**	0.3	**0.0025**	**0.035**	4.50	0.088	0.0962	0.008	0.23	1.60	**0.0035**	**0.0015**	0.4	53.2
06/16/08	5	21.6	**0.004**	3.68	**0.0035**	**0.15**	**0.0025**	0.07	4.00	0.064	0.0872	0.008	0.25	1.88	**0.0035**	**0.0015**	0.4	53.0
Mean		21.2	0.0039	4.92	0.0034	0.24	0.0024	0.123	4.54	0.230	0.0848	0.0098	0.25	1.91	0.0093	0.0015	0.34	47.8
Median		21.6	0.004	4.56	0.0035	0.3	0.0025	0.07	4.41	0.124	0.0872	0.008	0.25	1.99	0.0035	0.0015	0.4	53.0
St. Deviation		0.8	0.0002	1.21	0.0002	0.08	0.0002	0.099	0.82	0.258	0.0246	0.0035	0.06	0.19	0.009	0	0.09	7.3
# of values		5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Minimum		20.0	0.0035	3.68	0.003	0.15	0.002	0.035	3.87	0.064	0.0550	0.008	0.16	1.60	0.0035	0.0015	0.2	38.9
Maximum		21.8	0.004	6.92	0.0035	0.3	0.0025	0.28	5.93	0.684	0.118	0.016	0.32	2.08	0.024	0.0015	0.4	53.2
% of values undetected			100%		100%	40%	100%	20%							60%	100%		
# of values between MDL and MRL						3		4				5	1		1		5	

Notes:

Bold Results = Parameter undetected by test, value shown is 1/2 MDL or 1/2 MRL.

If result was not detected at the lab MDL, the value shown is 1/2 MDL.

If result was validation flagged U or UJ, the value shown is 1/2 MRL.

Green Results = Estimated result reported by laboratory below reporting limit (MRL).

MDL = Method Detection Limit.

MRL = Method Reporting Limit.

NA = Not Applicable.

All results reported on dry weight basis, except total solids reported on wet weight basis.

1 mg/kg = 1 milligram per kilogram.

APPENDIX 35.4C2

Laboratory Data Summary for Organic Constituents in Mussels 2008

Appendix 35.4C2, Laboratory Data Summary for Marine Mussel Tissues, Organic Constituents 2008

Location - Species - Tissue - Age	Sample Date	Subsample Number	C10 as n-Decane µg/g	C11 as n-Undecane µg/g	C12 as n-Dodecane µg/g	C13 as n-Tridecane µg/g	C14 as n-Tetradecane µg/g	C15 as n-Pentadecane µg/g	C16 as n-Hexadecane µg/g	C17 as n-Heptadecane µg/g	C18 as n-Octadecane µg/g
MPS1B-Mytilus trossulus-WHOLE-Age not specified	09/17/08	1	1.3836	0.1872	**0.05605**	0.1573	0.2796	0.5526	0.2982	1.1846	0.2989
MPS1-Mytilus trossulus-WHOLE-Age not specified	05/26/08	1	0.2421	0.1325	0.0831	0.0968	0.2503	0.3252	0.1922	0.5008	0.0967
MPS1-Mytilus trossulus-WHOLE-Age not specified	05/26/08	2	0.2154	0.1544	0.0872	0.0983	0.2229	0.3506	0.2016	0.5833	0.1616
MPS1-Mytilus trossulus-WHOLE-Age not specified	07/19/08	1	0.4568	0.2030	**0.05645**	0.1373	0.3082	0.4089	0.3027	0.9065	0.1334
MPS2-Mytilus trossulus-WHOLE-Age not specified	07/15/08	1	0.5500	0.1566	**0.0589**	0.1841	0.2614	0.5565	0.3965	3.1391	**0.06725**
MPS3-Mytilus trossulus-WHOLE-Age not specified	07/12/08	1	0.3907	**0.06085**	0.1403	0.2242	0.2061	0.3590	0.2070	0.7200	**0.06385**
MPS4-Mytilus trossulus-WHOLE-Age not specified	05/25/08	1	0.1498	0.1152	0.0413	0.0516	0.1042	0.2348	0.1014	0.3611	0.0724
MPS4-Mytilus trossulus-WHOLE-Age not specified	05/25/08	2	0.0979	0.0538	**0.0181**	**0.0150**	0.1122	0.1887	0.1100	0.2319	0.0607
MPS4-Mytilus trossulus-WHOLE-Age not specified	07/12/08	1	3.2720	0.3186	0.2852	0.1584	0.8445	0.6385	0.7047	1.8079	0.2640
MPS4-Mytilus trossulus-WHOLE-Age not specified	09/16/08	1	1.3857	**0.05495**	0.1049	0.1757	0.2008	0.4304	0.2015	0.5367	**0.05765**
		Minimum	0.0979	0.0538	0.0181	0.015	0.1042	0.1887	0.1014	0.2319	0.05765
		Maximum	3.272	0.3186	0.2852	0.2242	0.8445	0.6385	0.7047	3.1391	0.2989
		Median	0.4238	0.1435	0.0710	0.1473	0.2366	0.3840	0.2043	0.6517	0.0846

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Notes:
Bold Results = Parameter undetected by test, value shown is 1/2 MDL or 1/2 MRL.
If result was not detected at the lab MDL, the value shown is 1/2 MDL.
If result was validation flagged U or UJ, the value shown is 1/2 MRL.
Green Results = Estimated result reported by laboratory below reporting limit (MRL).
MDL = Method Detection Limit.
MRL = Method Reporting Limit.
NA = Not Applicable.
NS & T - National Status and Trends Mussel Watch
PAHs = polynuclear aromtaic hydrocarbons
TPH = total petroleum hydrocarbons
UCM = unresolved complex mixture
All results reported on dry weight basis.

Appendix 35.4C2, Laboratory Data Summary for Marine Mussel Tissues, Orga

Location - Species - Tissue - Age	Sample Date	Subsample Number	C19 as n-Nonadecane	C20 as n-Eicosane	C21 as n-Heneicosane	C22 as n-Docosane	C23 as n-Tricosane	C24 as n-Tetracosane	C25 as n-Pentacosane	C26 as n-Hexacosane	C27 as n-Heptacosane
			µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g
MPS1B-Mytilus trossulus-WHOLE-Age not specified	09/17/08	1	0.9970	1.1350	0.9669	12.7165	**1.81195**	**0.0648**	**0.1226**	**0.4588**	**0.0949**
MPS1-Mytilus trossulus-WHOLE-Age not specified	05/26/08	1	0.1692	1.2251	1.0696	0.1575	**0.7289**	0.1343	0.2035	**0.18455**	0.3714
MPS1-Mytilus trossulus-WHOLE-Age not specified	05/26/08	2	0.2880	1.4497	1.1885	0.2363	**0.7480**	0.0903	0.1034	**0.1894**	0.1558
MPS1-Mytilus trossulus-WHOLE-Age not specified	07/19/08	1	0.3257	0.9726	1.8509	13.6302	**1.82475**	**0.0653**	**0.1235**	**0.46205**	**0.09555**
MPS2-Mytilus trossulus-WHOLE-Age not specified	07/15/08	1	0.8205	**0.4665**	0.8495	12.2776	**1.9045**	**0.06815**	**0.1289**	**0.48225**	0.2092
MPS3-Mytilus trossulus-WHOLE-Age not specified	07/12/08	1	1.1330	**0.44295**	**0.3627**	4.3243	**1.80845**	0.1671	**0.1224**	**0.4579**	**0.0947**
MPS4-Mytilus trossulus-WHOLE-Age not specified	05/25/08	1	0.1300	0.8495	0.8647	0.2883	**0.65325**	0.1321	0.2832	**0.1654**	0.1731
MPS4-Mytilus trossulus-WHOLE-Age not specified	05/25/08	2	0.1431	0.7666	0.6706	0.2291	**0.58495**	0.0562	0.1315	**0.1481**	0.0831
MPS4-Mytilus trossulus-WHOLE-Age not specified	07/12/08	1	0.4536	**0.34655**	1.8811	1.9752	**1.4149**	0.2894	**0.09575**	**0.35825**	0.2611
MPS4-Mytilus trossulus-WHOLE-Age not specified	09/16/08	1	0.4746	**0.4000**	0.6558	4.5110	**1.63295**	**0.0584**	0.3546	**0.41345**	0.3017
		Minimum	0.13	0.34655	0.3627	0.1575	0.58495	0.0562	0.09575	0.1481	0.0831
		Maximum	1.133	1.4497	1.8811	13.6302	1.9045	0.2894	0.3546	0.48225	0.3714
		Median	0.3897	0.8081	0.9158	3.1498	1.5239	0.0792	0.1262	0.3859	0.1645

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Appendix 35.4C2, Laboratory Data Summary for Marine Mussel Tissues, Orga

Location - Species - Tissue - Age	Sample Date	Subsample Number	C28 as n-Octacosane µg/g	C29 as n-Nonacosane µg/g	C30 as n-Triacontane µg/g	C31 as n-Hentriacontane µg/g	C32 as n-Dotriacontane µg/g	C33 as n-Tritriacontane µg/g	C34 as n-Tetratriacontane µg/g	C35 as n-Pentatriacontane µg/g	Phytane µg/g
MPS1B-Mytilus trossulus-WHOLE-Age not specified	09/17/08	1	2.0399	1.2043	**0.3859**	**0.59015**	**0.1740**	**0.1505**	**0.1083**	**0.0513**	**2.3808**
MPS1-Mytilus trossulus-WHOLE-Age not specified	05/26/08	1	0.2242	1.7033	0.9928	0.5810	0.2644	0.1222	**0.04355**	0.1820	**0.9577**
MPS1-Mytilus trossulus-WHOLE-Age not specified	05/26/08	2	0.1188	1.8043	1.0225	0.5387	0.2854	**0.06215**	**0.0447**	0.3667	**0.9828**
MPS1-Mytilus trossulus-WHOLE-Age not specified	07/19/08	1	3.0262	2.1859	**0.3886**	**0.59435**	**0.1752**	**0.15155**	**0.10905**	**0.0517**	**2.3976**
MPS2-Mytilus trossulus-WHOLE-Age not specified	07/15/08	1	**0.09765**	1.0860	1.0624	**0.6203**	**0.18285**	**0.1582**	**0.11385**	**0.05395**	**2.50235**
MPS3-Mytilus trossulus-WHOLE-Age not specified	07/12/08	1	**0.09275**	0.5045	1.7418	**0.5890**	**0.17365**	**0.1502**	**0.1081**	**0.0512**	**2.37615**
MPS4-Mytilus trossulus-WHOLE-Age not specified	05/25/08	1	0.3255	2.0410	0.8791	**0.21275**	**0.0627**	**0.05425**	**0.03905**	0.1176	**0.85835**
MPS4-Mytilus trossulus-WHOLE-Age not specified	05/25/08	2	0.0933	1.2964	0.5525	**0.1905**	**0.05615**	**0.0486**	**0.03495**	0.4176	**0.76855**
MPS4-Mytilus trossulus-WHOLE-Age not specified	07/12/08	1	0.2101	0.5039	0.6559	**0.46085**	**0.13585**	0.2840	**0.08455**	**0.0401**	**1.85905**
MPS4-Mytilus trossulus-WHOLE-Age not specified	09/16/08	1	0.1800	1.0369	0.9975	**0.53185**	**0.1568**	**0.13565**	**0.0976**	**0.04625**	**2.14555**
		Minimum	0.09275	0.5039	0.3859	0.1905	0.05615	0.0486	0.03495	0.0401	0.76855
		Maximum	3.0262	2.1859	1.7418	0.6203	0.2854	0.284	0.11385	0.4176	2.50235
		Median	0.1951	1.2504	0.9360	0.5599	0.1738	0.1429	0.0911	0.0528	2.0023

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Appendix 35.4C2, Laboratory Data Summary for Marine Mussel Tissues, Orga

Location - Species - Tissue - Age	Sample Date	Subsample Number	Pristane µg/g	Total Alkanes µg/g	Total Resolved µg/g	Total TPH µg/g	Total UCM µg/g	% Lipid percent	1-Methylnaphthalene µg/kg	1-Methylphenanthrene µg/kg
MPS1B-Mytilus trossulus-WHOLE-Age not specified	09/17/08	1	**0.0478**	25.9178	242.58	375.72	133.14	1.0	**3.45**	**1.2**
MPS1-Mytilus trossulus-WHOLE-Age not specified	05/26/08	1	0.2180	10.1322	131.28	439.31	308.02	4.6	**1.4**	**0.5**
MPS1-Mytilus trossulus-WHOLE-Age not specified	05/26/08	2	0.2390	10.5185	135.46	475.18	339.71	4.7	**1.4**	1.0
MPS1-Mytilus trossulus-WHOLE-Age not specified	07/19/08	1	**0.0481**	27.9427	245.34	339.00	93.65	4.1	**3.45**	**1.2**
MPS2-Mytilus trossulus-WHOLE-Age not specified	07/15/08	1	**0.0502**	25.6907	200.60	616.67	416.07	5.8	**3.6**	**1.25**
MPS3-Mytilus trossulus-WHOLE-Age not specified	07/12/08	1	0.1250	13.6841	197.68	887.25	689.57	5.3	**3.45**	**1.2**
MPS4-Mytilus trossulus-WHOLE-Age not specified	05/25/08	1	0.2083	8.7582	135.24	372.20	236.96	5.6	2.6	0.9
MPS4-Mytilus trossulus-WHOLE-Age not specified	05/25/08	2	0.1585	6.2003	103.64	295.38	191.74	3.4	**1.1**	**0.4**
MPS4-Mytilus trossulus-WHOLE-Age not specified	07/12/08	1	0.1062	17.2309	225.81	507.85	282.04	9.1	7.1	**0.9**
MPS4-Mytilus trossulus-WHOLE-Age not specified	09/16/08	1	**0.04305**	14.3918	161.26	508.09	346.83	5.2	**3.1**	2.1
		Minimum	0.04305	6.2003	103.64	295.38	93.65	1.0	1.1	0.4
		Maximum	0.239	27.9427	245.34	887.25	689.57	9.1	7.1	2.1
		Median	0.1156	14.0380	179.47	457.25	295.03	5.0	3.3	1.1

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Appendix 35.4C2, Laboratory Data Summary for Marine Mussel Tissues, Orga

Location - Species - Tissue - Age	Sample Date	Subsample Number	2,6-Dimethylnaphthalene µg/kg	2-Methylnaphthalene µg/kg	Acenaphthene µg/kg	Acenaphthylene µg/kg	Anthracene µg/kg	Benzo(a)anthracene µg/kg	Benzo(a)pyrene µg/kg	Benzo(b)fluoranthene µg/kg
MPS1B-Mytilus trossulus-WHOLE-Age not specified	09/17/08	1	**1.8**	6.4	**2.95**	**1.9**	**2.25**	**2.5**	**4.85**	**4.5**
MPS1-Mytilus trossulus-WHOLE-Age not specified	05/26/08	1	3.2	2.4	4.2	**0.75**	**0.9**	**1.0**	**1.95**	**1.8**
MPS1-Mytilus trossulus-WHOLE-Age not specified	05/26/08	2	3.4	**1.15**	4.5	**0.8**	**0.9**	**1.05**	**2.0**	**1.85**
MPS1-Mytilus trossulus-WHOLE-Age not specified	07/19/08	1	**1.8**	6.1	**3.0**	**1.9**	**2.25**	**2.5**	**4.9**	**4.55**
MPS2-Mytilus trossulus-WHOLE-Age not specified	07/15/08	1	4.6	8.2	**3.15**	**2.0**	**2.35**	**2.6**	**5.1**	**4.75**
MPS3-Mytilus trossulus-WHOLE-Age not specified	07/12/08	1	4.2	7.3	**2.95**	**1.9**	**2.25**	**2.5**	**4.85**	**4.5**
MPS4-Mytilus trossulus-WHOLE-Age not specified	05/25/08	1	3.8	3.8	3.9	**0.7**	**0.8**	**0.9**	**1.75**	**1.65**
MPS4-Mytilus trossulus-WHOLE-Age not specified	05/25/08	2	1.6	1.9	2.8	**0.6**	**0.7**	**0.8**	**1.55**	**1.45**
MPS4-Mytilus trossulus-WHOLE-Age not specified	07/12/08	1	3.8	8.5	7.2	**1.5**	**1.75**	**1.95**	**3.8**	**3.55**
MPS4-Mytilus trossulus-WHOLE-Age not specified	09/16/08	1	**1.6**	6.3	**2.7**	**1.7**	**2.0**	**2.25**	**4.4**	**4.05**
		Minimum	1.6	1.15	2.7	0.6	0.7	0.8	1.55	1.45
		Maximum	4.6	8.5	7.2	2	2.35	2.6	5.1	4.75
		Median	3.3	6.2	3.1	1.6	1.9	2.1	4.1	3.8

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Appendix 35.4C2, Laboratory Data Summary for Marine Mussel Tissues, Orga

Location - Species - Tissue - Age	Sample Date	Subsample Number	Benzo(e)pyrene µg/kg	Benzo(g,h,i)perylene µg/kg	Benzo(k)fluoranthene µg/kg	Biphenyl µg/kg	C1 - Naphthalene µg/kg	C1-Chrysene µg/kg	C1-Dibenzothiophene µg/kg	C1-Fluoranthene/ Pyrene µg/kg
MPS1B-Mytilus trossulus-WHOLE-Age not specified	09/17/08	1	**2.45**	**3.8**	**3.1**	**3.0**	**6.2**	**3.9**	**1.95**	**5.0**
MPS1-Mytilus trossulus-WHOLE-Age not specified	05/26/08	1	**1.0**	**1.55**	**1.25**	2.7	**2.5**	9.8	1.9	5.5
MPS1-Mytilus trossulus-WHOLE-Age not specified	05/26/08	2	**1.0**	**1.6**	**1.25**	**1.25**	**2.55**	14.1	2.2	5.2
MPS1-Mytilus trossulus-WHOLE-Age not specified	07/19/08	1	**2.45**	**3.85**	**3.1**	**3.0**	**6.25**	**3.95**	**1.95**	**5.05**
MPS2-Mytilus trossulus-WHOLE-Age not specified	07/15/08	1	**2.55**	**4.0**	**3.25**	21.4	14.1	**4.1**	**2.05**	**5.25**
MPS3-Mytilus trossulus-WHOLE-Age not specified	07/12/08	1	**2.45**	**3.8**	**3.1**	21.4	**6.2**	**3.9**	4.0	**5.0**
MPS4-Mytilus trossulus-WHOLE-Age not specified	05/25/08	1	**0.9**	**1.4**	**1.1**	4.6	6.4	6.6	3.5	5.1
MPS4-Mytilus trossulus-WHOLE-Age not specified	05/25/08	2	**0.8**	**1.25**	**1.0**	**0.95**	**2.0**	5.7	1.5	5.0
MPS4-Mytilus trossulus-WHOLE-Age not specified	07/12/08	1	**1.9**	**3.0**	**2.4**	17.0	15.6	**3.05**	**1.5**	**3.9**
MPS4-Mytilus trossulus-WHOLE-Age not specified	09/16/08	1	**2.2**	**3.45**	**2.8**	22.2	**5.6**	**3.55**	**1.75**	**4.5**
		Minimum	0.8	1.25	1.0	0.95	2	3.05	1.5	3.9
		Maximum	2.55	4.0	3.25	22.2	15.6	14.1	4	5.5
		Median	2.1	3.2	2.6000	3.8000	6.2000	4.0250	1.9500	5.0250

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Appendix 35.4C2, Laboratory Data Summary for Marine Mussel Tissues, Orga

Location - Species - Tissue - Age	Sample Date	Subsample Number	C1-Fluorene µg/kg	C1-Phenanthrene/ Anthracene µg/kg	C2 - Fluoranthene/ Pyrene µg/kg	C2-Chrysene µg/kg	C2-Dibenzothiophene µg/kg	C2-Fluorene µg/kg	C2-Naphthalene µg/kg	C2-Phenanthrene/ Anthracene µg/kg	C3 - Fluoranthene/ Pyrene µg/kg
MPS1B-Mytilus trossulus-WHOLE-Age not specified	09/17/08	1	**5.65**	**2.35**	**5.0**	**3.9**	**1.95**	**5.65**	**3.6**	**2.35**	**5.0**
MPS1-Mytilus trossulus-WHOLE-Age not specified	05/26/08	1	14.5	8.4	**2.0**	12.5	14.3	34.9	6.5	9.9	**2.0**
MPS1-Mytilus trossulus-WHOLE-Age not specified	05/26/08	2	18.4	13.1	5.1	12.9	13.3	38.9	6.4	12.9	**2.05**
MPS1-Mytilus trossulus-WHOLE-Age not specified	07/19/08	1	**5.7**	**2.4**	**5.05**	**3.95**	**1.95**	**5.7**	**3.65**	**2.4**	**5.05**
MPS2-Mytilus trossulus-WHOLE-Age not specified	07/15/08	1	**5.95**	6.8	**5.25**	**4.1**	7.9	**5.95**	18.5	13.2	**5.25**
MPS3-Mytilus trossulus-WHOLE-Age not specified	07/12/08	1	**5.65**	6.5	**5.0**	**3.9**	4.9	**5.65**	9.9	10.2	**5.0**
MPS4-Mytilus trossulus-WHOLE-Age not specified	05/25/08	1	9.7	9.8	**1.8**	11.0	13.8	35.8	7.0	10.5	**1.8**
MPS4-Mytilus trossulus-WHOLE-Age not specified	05/25/08	2	11.5	7.7	**1.6**	7.8	8.9	29.7	3.6	6.2	**1.6**
MPS4-Mytilus trossulus-WHOLE-Age not specified	07/12/08	1	**4.4**	**1.85**	**3.9**	**3.05**	**1.5**	**4.4**	10.8	**1.85**	**3.9**
MPS4-Mytilus trossulus-WHOLE-Age not specified	09/16/08	1	**5.1**	**2.15**	**4.5**	**3.55**	**1.75**	**5.1**	8.0	**2.15**	**4.5**
		Minimum	4.4	1.85	1.6	3.05	1.5	4.4	3.6	1.85	1.6
		Maximum	18.4	13.1	5.25	12.9	14.3	38.9	18.5	13.2	5.25
		Median	5.8	6.7	4.8	4.0	6.4	5.8	6.8	8.1	4.2

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Appendix 35.4C2, Laboratory Data Summary for Marine Mussel Tissues, Orga

Location - Species - Tissue - Age	Sample Date	Subsample Number	C3-Chrysene µg/kg	C3-Dibenzothiophene µg/kg	C3-Fluorene µg/kg	C3-Naphthalene µg/kg	C3-Phenanthrene/ Anthracene µg/kg	C4-Chrysene µg/kg	C4-Naphthalene µg/kg	C4-Phenanthrene/ Anthracene µg/kg	Chrysene µg/kg
MPS1B-Mytilus trossulus-WHOLE-Age not specified	09/17/08	1	**3.9**	**1.95**	**5.65**	**5.45**	**2.35**	**3.9**	**5.45**	**2.35**	**1.95**
MPS1-Mytilus trossulus-WHOLE-Age not specified	05/26/08	1	4.1	4.1	16.6	5.1	19.3	**1.6**	**2.2**	10.1	1.7
MPS1-Mytilus trossulus-WHOLE-Age not specified	05/26/08	2	**1.6**	5.0	10.3	5.9	21.7	3.6	**2.25**	13.1	1.7
MPS1-Mytilus trossulus-WHOLE-Age not specified	07/19/08	1	**3.95**	**1.95**	**5.7**	**5.5**	**2.4**	**3.95**	**5.5**	**2.4**	**1.95**
MPS2-Mytilus trossulus-WHOLE-Age not specified	07/15/08	1	**4.1**	**2.05**	**5.95**	**5.7**	**2.5**	**4.1**	**5.7**	**2.5**	**2.05**
MPS3-Mytilus trossulus-WHOLE-Age not specified	07/12/08	1	**3.9**	**1.95**	**5.65**	**5.45**	**2.35**	**3.9**	**5.45**	**2.35**	**1.95**
MPS4-Mytilus trossulus-WHOLE-Age not specified	05/25/08	1	7.1	5.9	15.4	5.7	24.2	5.1	**1.95**	9.8	**0.7**
MPS4-Mytilus trossulus-WHOLE-Age not specified	05/25/08	2	4.1	2.8	13.4	3.7	14.3	**1.25**	**1.75**	7.3	**0.65**
MPS4-Mytilus trossulus-WHOLE-Age not specified	07/12/08	1	**3.05**	**1.5**	**4.4**	9.2	**1.85**	**3.05**	**4.25**	**1.85**	**1.55**
MPS4-Mytilus trossulus-WHOLE-Age not specified	09/16/08	1	**3.55**	**1.75**	**5.1**	**4.9**	**2.15**	**3.55**	**4.9**	**2.15**	**1.75**
		Minimum	1.6	1.5	4.4	3.7	1.85	1.25	1.75	1.85	0.65
		Maximum	7.1	5.9	16.6	9.2	24.2	5.1	5.7	13.1	2.05
		Median	3.9	2.0	5.8	5.5	2.5	3.8	4.6	2.5	1.7

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Appendix 35.4C2, Laboratory Data Summary for Marine Mussel Tissues, Orga

Location - Species - Tissue - Age	Sample Date	Subsample Number	Dibenzo(a,h) anthracene µg/kg	Dibenzothiophene µg/kg	Fluoranthene µg/kg	Fluorene µg/kg	Indeno(1,2,3-cd) pyrene µg/kg	Naphthalene µg/kg	Naphthalene, 1,6,7-trimethyl- µg/kg	Perylene µg/kg	Phenanthrene µg/kg
MPS1B-Mytilus trossulus-WHOLE-Age not specified	09/17/08	1	**2.45**	**0.95**	**2.4**	**2.85**	**4.6**	18.9	**2.7**	**1.1**	8.6
MPS1-Mytilus trossulus-WHOLE-Age not specified	05/26/08	1	**1.0**	**0.4**	**0.95**	**1.15**	**1.85**	6.7	**1.1**	3.5	3.1
MPS1-Mytilus trossulus-WHOLE-Age not specified	05/26/08	2	**1.0**	**0.4**	**1.0**	**1.15**	**1.9**	6.2	**1.1**	3.9	4.8
MPS1-Mytilus trossulus-WHOLE-Age not specified	07/19/08	1	**2.45**	**1.0**	**2.4**	**2.85**	**4.65**	12.8	**2.75**	**1.15**	14.1
MPS2-Mytilus trossulus-WHOLE-Age not specified	07/15/08	1	**2.55**	**1.0**	**2.55**	**2.95**	**4.85**	15.6	**2.85**	**1.2**	5.7
MPS3-Mytilus trossulus-WHOLE-Age not specified	07/12/08	1	**2.45**	**0.8**	**2.4**	**2.8**	**4.6**	16.7	**2.7**	**1.1**	5.7
MPS4-Mytilus trossulus-WHOLE-Age not specified	05/25/08	1	**0.9**	**0.35**	**0.85**	**1.0**	**1.65**	10.9	2.0	2.8	3.6
MPS4-Mytilus trossulus-WHOLE-Age not specified	05/25/08	2	**0.8**	**0.3**	**0.8**	**0.9**	**1.5**	4.8	**0.9**	2.6	3.4
MPS4-Mytilus trossulus-WHOLE-Age not specified	07/12/08	1	**1.9**	**0.75**	**1.9**	**2.2**	**3.6**	18.2	**2.15**	**0.9**	7.0
MPS4-Mytilus trossulus-WHOLE-Age not specified	09/16/08	1	**2.2**	**0.85**	**2.15**	**2.55**	**4.15**	23.4	**2.45**	4.7	**2.4**
		Minimum	0.8	0.3	0.8	0.9	1.5	4.8	0.9	0.9	2.4
		Maximum	2.55	1.0	2.55	2.95	4.85	23.4	2.85	4.7	14.1
		Median	2.1	0.8	2.0	2.4	3.9	14.2	2.3	1.9	5.3

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Appendix 35.4C2, Laboratory Data Summary for Marine Mussel Tissues, Orga

Location - Species - Tissue - Age	Sample Date	Subsample Number	PAHs, Total µg/kg	Pyrene µg/kg	Total NS&T PAHs µg/kg	Total PAHs without Perylene µg/kg
MPS1B-Mytilus trossulus-WHOLE-Age not specified	09/17/08	1	43.3	**2.6**	45.3	43.3
MPS1-Mytilus trossulus-WHOLE-Age not specified	05/26/08	1	224.9	**1.05**	37.7	221.4
MPS1-Mytilus trossulus-WHOLE-Age not specified	05/26/08	2	249.1	**1.05**	39.3	245.2
MPS1-Mytilus trossulus-WHOLE-Age not specified	07/19/08	1	46.8	**2.6**	49.2	44.6
MPS2-Mytilus trossulus-WHOLE-Age not specified	07/15/08	1	135.3	**2.75**	74.8	135.3
MPS3-Mytilus trossulus-WHOLE-Age not specified	07/12/08	1	116.3	**2.6**	72.2	116.3
MPS4-Mytilus trossulus-WHOLE-Age not specified	05/25/08	1	235.3	**0.95**	43.9	232.5
MPS4-Mytilus trossulus-WHOLE-Age not specified	05/25/08	2	165.5	**0.85**	25.7	163.0
MPS4-Mytilus trossulus-WHOLE-Age not specified	07/12/08	1	108.5	**2.05**	83.2	108.5
MPS4-Mytilus trossulus-WHOLE-Age not specified	09/16/08	1	103.2	**2.35**	86.4	98.5
		Minimum	43.3	0.85	25.7	43.3
		Maximum	249.1	2.75	86.4	245.2
		Median	125.8	2.2	47.3	125.8

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APPENDIX 35.4C3

Key to Identification Codes Used in Appendix 35.4C1 and Station Codes Used in Tables and Figures

Key to Identification Codes Used in Appendix 35.4C1 and Station Codes Used in Tables and Figures

Station Codes Differ between Data in Appendices and Data Presented in Tables, Graphs, and Maps due to the Refinement of *Station Naming Conventions* over Time

ID Code in Appendix (Location[a]-Species[b]-Tissue Type-Age)	Station Code	Fish or Invertebrate	Year
ILIAMNA-*Oncorhynchus keta* -MUSCLE-Age ADULT	Iliamna Bay	Fish	2008
ILIAMNA-*Platichthys stellatus* -WHOLE-Age not spec	Iliamna Bay	Fish	2008
ILIAMNA-*Salvelinus malma Walbaum*-WHOLE-Age JUV	Iliamna Bay	Fish	2008
INISKIN- *Limanda aspera*-WHOLE-Age not spec	Iniskin Bay	Fish	2008
INISKIN- *Salvelinus malma Walbaum*-WHOLE-Age JUV	Iniskin Bay	Fish	2008
MBS03-*Platichthys stellatus* -WHOLE-Age NOT SPEC	MBS3	Fish	2005
MBS04-*Salvelinus malma Walbaum*-WHOLE-Age NOT SPEC	MBS4	Fish	2005
MBS3A-Pleuronectidae family-WHOLE-Age NOT SPEC	MBS3	Fish	2005
MBSA1-*Cottidae sp.* -WHOLE-Age NOT SPEC	MBSA1	Fish	2005
MBSA1-Pleuronectidae family-WHOLE-Age NOT SPEC	MBSA1	Fish	2005
MBSA-*Salvelinus malma Walbaum*-MUSCLE-Age adult	Iliamna Bay	Fish	2008
MIN-*Hippoglossus stenolepis* -MUSCLE-Age NOT SPEC	Iniskin Bay	Fish	2008
Mouth of Y Valley Creek- *Salvelinus malma Walbaum*-MUSCLE-Age ad	MYVL	Fish	2008
MPS11-*Fusitriton oregonensis* -WHOLE-Age NOT SPEC	MPS11dx	Inv	2004
MPS11-*Hexagrammos stelleri*-WHOLE-Age NOT SPEC	MPS1	Fish	2004
MPS11-*Leptocottus armatus* -WHOLE-Age NOT SPEC	MPS1T	Fish	2004
MPS11-*Modiolus modiolus*-WHOLE-Age NOT SPEC	MPS1	Inv	2004
MPS11-*Neptunea lyrata* -WHOLE-Age NOT SPEC	MPS11dx	Inv	2004
MPS11-*Telmessus cheiragonus*-WHOLE-Age NOT SPEC	MPS11dx	Inv	2004
MPS1B-*Clinocardium nuttalli*-WHOLE-Age NOT SPEC	MPS1Bdx	Inv	2004
MPS1B-*Mactromeris polynyma*-WHOLE-Age NOT SPEC	MPS1Bdx	Inv	2004
MPS1B-*Mytilus trossulus* -WHOLE-Age not spec	MPS1B	Inv	2008
MPS1C-*Salvelinus malma Walbaum*-WHOLE-Age NOT SPEC	MPS1C	Fish	2005
MPS1-*Hippoglossus stenolepis* -MUSCLE-Age NOT SPEC	Iniskin Bay	Fish	2008
MPS1M-*Mytilus trossulus* -WHOLE-Age NOT SPEC	MPS1	Inv	2004
MPS1-*Mytilus trossulus* -WHOLE-Age NOT SPEC	MPS1B	Inv	2008
MPS21-*Cottidae sp.* -WHOLE-Age NOT SPEC	MPS2H	Fish	2004
MPS21-*Hyas lyratus* -WHOLE-Age NOT SPEC	MPS2Cr	Inv	2004
MPS21-*Telmessus cheiragonus*-WHOLE-Age NOT SPEC	MPS2Cr	Inv	2004
MPS2-*Mytilus trossulus* -WHOLE-Age not spec	MPS2	Inv	2004
MPS2-*Mytilus trossulus* -WHOLE-Age not spec	MPS2	Inv	2008
MPS2TA-*Hippoglossus stenolepis* -MUSCLE-Age not spec	Iniskin Bay	Fish	2008
MPS2TA-*Limanda aspera*-WHOLE-Age NOT SPEC	Iniskin Bay	Fish	2005
MPS31-*Oncorhynchus keta* -LIVER-Age NOT SPEC	MPS3	Fish	2004
MPS3-*Clinocardium nuttalli*-WHOLE-Age NOT SPEC	MPS3	Inv	2004
MPS3-*Mytilus trossulus* -WHOLE-Age NOT SPEC	MPS3	Inv	2004
MPS3-*Mytilus trossulus* -WHOLE-Age NOT SPEC	MPS3	Inv	2008
MPS3-*Oncorhynchus keta* -MUSCLE-Age NOT SPEC	MPS3	Fish	2004
MPS4-*Hexagrammos stelleri*-WHOLE-Age NOT SPEC	MPS4	Fish	2005
MPS4-*Hippoglossus stenolepis* -MUSCLE-Age NOT SPEC	Iliamna Bay	Fish	2008
MPS4L-*Macoma obliqua*-WHOLE-Age NOT SPEC	MPS4	Inv	2004
MPS4M-*Mytilus trossulus* -WHOLE-Age NOT SPEC	MPS4	Inv	2004
MPS4-*Mytilus trossulus* -WHOLE-Age not spec	MPS4	Inv	2008
MPSE-*Mya arenaria* -WHOLE-Age NOT SPEC	MPSE	Inv	2004

ID Code in Appendix (Location[a]-Species[b]-Tissue Type-Age)	Station Code	Fish or Invertebrate	Year
MPSE-Pleuronectidae family-WHOLE-Age NOT SPEC	MPSE	Fish	2005
MTR03-*Hexagrammos sp.*-WHOLE-Age NOT SPEC	MTR3	Fish	2005
MTR1A-*Hexagrammos stelleri*-WHOLE-Age NOT SPEC	MTR1	Fish	2005
MTR2-*Hippoglossus stenolepis* -MUSCLE-Age not spec	Iliamna Bay	Fish	2008
MYVCM-*Oncorhynchus gorbuscha* -MUSCLE-Age ADULT	MYVCM	Fish	2008
MYVCM-*Oncorhynchus keta* -MUSCLE-Age ADULT	MYVCM	Fish	2008
MYVCM-*Salvelinus malma Walbaum*-MUSCLE-Age ADULT	MYVCM	Fish	2008

Notes:

a. When present, the letters "M" or "L" at the end of location codes for invertebrates indicate that samples were collected at the middle or low tidal elevations, respectively.

b. See Table 35.4-5 in the Pebble Project environmental baseline document for the common names of the species s