Technical Memorandum
Background Determination for Risk Assessment

DERIVATION OF AMBIENT CONCENTRATIONS FOR ABIOTIC MEDIA ASSOCIATED WITH THE NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

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Prepared for:
Department of Army
United States Army Engineer District, Alaska
Corps of Engineers
P.O. Box 898
Anchorage, Alaska 99506-0898

Prepared by:
MWH Americas, Inc
4100 Spenard Road
Anchorage, Alaska 99517
(907) 248-8883
(907) 248-8884 Fax

TABLE OF CONTENTS

LIST OF TABLES

LIST OF ATTACHMENTS

Attachment A - Statistical Analysis Tables

EXECUTIVE SUMMARY

On behalf of the United States Army Engineer District, Alaska, MWH Americas, Inc. (MWH) developed ambient levels for abiotic media associated with the Northeast Cape, St. Lawrence Island, Alaska. Ambient levels were developed for the Northeast Cape Site, Pursuant to Contract No. DACA85-98-D-0007, in support of human health and ecological risk assessments conducted under the Phase III Remedial Investigation for Northeast Cape. The ambient levels included herein will be used to screen chemicals of potential concern and chemicals of potential ecological concern during screening phases of the human health and ecological risk assessments for Northeast Cape.

Ambient levels were previously developed for Northeast Cape, as documented in the *Draft 2001 Phase III Remedial Investigation and Risk Assessment Update, Northeast Cape, St. Lawrence Island, Alaska* (MWH, 2002). Previous ambient levels were calculated using the results of environmental samples collected from locations of the site believed unimpacted by site contaminants. 'Ambient' samples included ten soil samples, five sediment samples, three surface water samples and four shallow groundwater samples. Comments on the Draft 2001 Phase III Remedial Investigation and Risk Assessment report expressed concerns over the quantity and quality of ambient data collected for Northeast Cape, and the extent of documentation supporting development of ambient concentrations. This technical memorandum describes the methods and results of a revised ambient level determination for abiotic media at Northeast Cape. Abiotic media for which updated ambient levels were developed include the following:

- Tundra soil
- Gravel soil
- Freshwater sediment
- Fresh surface water
- Ephemeral surface water
- Shallow subsurface water
- Deep subsurface water

Based on perceived limitations in the data collected from background sampling locations at Northeast Cape, an alternate approach was used to derive ambient levels that is consistent with methods described in USEPA's *Methods for Evaluating the Attainment of Cleanup Standards, Volume I: Soils and Solid Media* (USEPA, 1989) and *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Addendum to Interim Final Guidance* (USEPA, 1992). Additional guidance for this approach may be found in *Selecting Inorganic Constituents as Chemicals of Potential Concern at Risk Assessments at Hazardous Waste Sites and Permitted Facilities, Final Policy* (Cal/EPA, 1997). It should be noted that background derivation methods specified in *Technical Guidance Document for Determination of Background Concentrations* (ADEC, 1998) are no longer endorsed by ADEC, and this guidance has been removed from regulation, but can still be used as guidance. Furthermore, USEPA's *External Review Draft Guidance for Characterizing Background Chemicals in Soil at Superfund Sites* (USEPA, 2001) provides guidance for performing statistical comparisons between background and site-related

data sets. However, this guidance is less relevant to the approach described herein which uses data collected from *all* areas of the Northeast Cape (i.e., both background sampling locations and site characterization locations) based on an assumption that the ambient distribution of a particular inorganic chemical represents a significant fraction, if not all, of detected concentrations across the site. This underlying assumption is reasonable for sites that are not associated with significant metals handling or disposal, and this hypothesis can be statistically tested as described below.

Briefly, outlier tests and probability plotting techniques were used to identify portions of the concentration distribution of each inorganic chemical in a given medium that may represent potential contamination. These data were then eliminated from the data set and a background upper tolerance limit (BUTL) on the mean concentration for the remaining data was calculated. For this analysis, the 95 percent (%) BUTL for 95% coverage (i.e., 95/95 BUTL) concentration was calculated, consistent with methods described in USEPA (1992, 1989). The 95/95 BUTL represents a value below which 95% of the population is expected to fall with 95% confidence. Ambient levels derived in this manner were evaluated against regional ambient concentrations, where available, including ambient concentrations for soils and sediments described in *Element Concentrations in Soil and Other Surficial Materials of Alaska* (USGS, 1988), for comparison. Derived ambient concentrations for abiotic media at Northeast Cape are summarized in Tables E-1 through E-4.

For tundra soils, sufficient data were available to derive ambient levels for aluminum, arsenic, barium, beryllium, cadmium, chromium, cobalt, copper, lead, manganese, mercury, nickel, thallium, vanadium and zinc (Table E-1). In all cases except cadmium and thallium, derived ambient levels were within the range of typical concentrations reported for Alaska soils. Published ambient levels for Alaska soils are not available for cadmium or thallium. The upper end of the range of ambient levels for cadmium in mid-western U.S. soils is approximately one-half the ambient concentration calculated for the Northeast Cape. Insufficient data were available to derive ambient levels for antimony, selenium and silver in tundra soils at Northeast Cape. For gravel soils, sufficient data were available to derive ambient levels for arsenic, cadmium, chromium, copper, lead, nickel, thallium and zinc (Table E-1). Again, derived ambient levels for gravel soils at Northeast Cape were within the range of typical concentrations reported for soils in Alaska for all chemicals except cadmium and thallium. Insufficient data were available to derive ambient levels for aluminum, antimony, barium, beryllium, cobalt, manganese, mercury, selenium, silver, and vanadium in gravel soils at Northeast Cape.

For freshwater sediment, sufficient data were available to derive ambient levels for beryllium, chromium, copper, lead, nickel and zinc (Table E-2). In all cases, derived ambient levels were within the range of typical concentrations reported for Alaskan lake and stream sediments. Insufficient data were available to derive ambient levels for aluminum, antimony, arsenic, barium, cadmium, cobalt, manganese, mercury, selenium silver, thallium and vanadium in freshwater sediments of Northeast Cape.

Insufficient data were available to calculate ambient levels for any inorganic chemicals in permanent fresh surface water (Table E-3). Sufficient data were only available to derive ambient levels for aluminum, barium, copper, lead, manganese, total zinc, and dissolved zinc in

ephemeral surface water. Inorganic concentrations of other chemicals in surface water tended to be non-detect or were detected with frequencies too low to calculate meaningful 95/95 BUTLs.

For shallow subsurface water, sufficient data were available to derive ambient levels for total arsenic, beryllium, cadmium, chromium, cobalt, copper, lead, manganese, mercury, nickel, vanadium, total zinc; and dissolved arsenic (Table E-4). Ambient or 'typical' levels of inorganic chemicals in subsurface waters of Alaska are not currently available. However, derived ambient levels were lower than, or within the range of, ADEC Table C Groundwater Cleanup Levels (18 AAC 75.345) (Table E-4). Insufficient data were available to derive ambient levels for aluminum, antimony, barium, selenium, silver and thallium in shallow subsurface water at Northeast Cape. The only inorganic chemical detected in deep subsurface water was manganese, and insufficient data were available to calculate ambient levels for this chemical (Table E-4).

Based on this assessment, the derived ambient levels for tundra soils, gravel soils, freshwater sediments, and shallow subsurface water described herein are proposed for use as contaminant screening criteria in the revised human health and ecological risk assessments for Northeast Cape.

Table E-1
Proposed Ambient Levels for Soil
Northeast Cape, St. Lawrence Island, Alaska

Chemical	NEC Soil BUTL		Ambient Soil Concentration	
	Tundra Soil	Gravel Soil	Mean	Range
Inorganic (mg/kg)				
Aluminum	30,357	nc	65,000 [a]	12,000 - 100,000 [a]
Antimony	nc	nc	na	na
Arsenic	7.8	11	9.6 [a]	<10 - 750 [a]
Barium	174	nc	678 [a]	39 - 3,100 [a]
Beryllium	3.8	nc	1.35 [a]	<1 - 7 [a]
Cadmium	1.4	3.1	0.5 [c]	0.01 - 0.70 [c]
Chromium	48	50	64 [a]	5 - 390 [a]
Cobalt	49	nc	14 [a]	<2 - 55 [a]
Copper	107	44	29 [a]	3 - 810 [a]
Lead	106	112	14 [a]	<4 - 310 [a]
Manganese	1,589	nc	670 [a]	200 - 4,000 [a]
Mercury	0.43	nc	0.046 [b]	<0.01 - 4.6 [b]
Nickel	59	30	33 [a]	<3 - 320 [a]
Selenium	nc	nc	na	na
Silver	nc	nc	na	na
Thallium	1.6	0.56	na	na
Vanadium	73	nc	129 [a]	11 - 490 [a]
Zinc	615	157	79 [a]	<20 - 2,700 [a]

Notes:
mg/kg = Milligrams per kilogram.
na - Not applicable.
nc - Not calculated.

[a] Source: Gough, L.P., R.C. Severson and H.T. Shacklette, 1984. *Element Concentrations in Soil and Other Surficial Materials of Alaska* , United States Geological Survey, Professional Paper 1458.

[b] Source: Shacklette, H.T. and J.G. Boerngen, 1984. *Element Concentrations in Soil and Other Surficial Materials of the Conterminous United States* , United States Geological Survey, Professional Paper 1270.

[c] Source: Baker, D.E. and L. Chesnin, 1975. Chemical monitoring of soils for environmental quality and animal and human health. *Advan. Agron* ., 27:306-374.

Table E-2
Proposed Ambient Levels for Sediment
Northeast Cape, St. Lawrence Island, Alaska

Chemical	NEC Freshwater Sediment BUTL	Ambient Sediment Concentration [a]	
		Mean	Range
Inorganic (mg/kg)			
Aluminum	nc	na	na
Antimony	nc	na	na
Arsenic	nc	na	na
Barium	nc	na	na
Beryllium	9.8	2.0	1.0 - 12
Cadmium	nc	na	na
Chromium	34	115	1 - 15,000
Cobalt	nc	na	na
Copper	40	37	7 - 14,000
Lead	78	12	4 - 10,000
Manganese	nc	na	na
Mercury	nc	na	na
Nickel	126	37	9 - 1,800
Selenium	nc	na	na
Silver	nc	na	na
Thallium	nc	na	na
Vanadium	nc	na	na
Zinc	148	157	14 - 4,700

Notes:
mg/kg = Milligrams per kilogram.
na - Not applicable.
nc - Not calculated.
[a] Source: Gough, L.P., R.C. Severson and H.T. Shacklette, 1984. Element Concentrations in Soil and Other Surficial Materials of Alaska, United States Geological Survey, Professional Paper 1458.

Table E-3
Proposed Ambient Levels for Surface Water
Northeast Cape, St. Lawrence Island, Alaska

Chemical	NEC Fresh Surface Water BUTL	NEC Ephemeral Surface Water BUTL	USEPA Freshwater Ambient Water Quality Criterion[a]
Inorganics, Total (mg/L)			
Aluminum	nc	2.2	0.087
Antimony	nc	nc	na
Arsenic	nc	nc	na
Barium	nc	0.034	na
Beryllium	nc	nc	na
Cadmium	nc	nc	na
Chromium	nc	nc	na
Cobalt	nc	nc	na
Copper	nc	0.083	0.009
Lead	nc	0.014	0.0025
Manganese	nc	0.12	1.0 [b]
Mercury	nc	nc	na
Nickel	nc	nc	na
Selenium	nc	nc	na
Silver	nc	nc	na
Thallium	nc	nc	na
Vanadium	nc	nc	na
Zinc	nc	0.90	0.11
Inorganics, Dissolved (mg/L)			
Antimony, Dissolved	nc	nc	na
Arsenic, Dissolved	nc	nc	na
Beryllium, Dissolved	nc	nc	na
Cadmium, Dissolved	nc	nc	na
Chromium, Dissolved	nc	nc	na
Copper, Dissolved	nc	nc	na
Lead, Dissolved	nc	nc	na
Mercury, Dissolved	nc	nc	na
Nickel, Dissolved	nc	nc	na
Selenium, Dissolved	nc	nc	na
Silver, Dissolved	nc	nc	na
Thallium, Dissolved	nc	nc	na
Zinc, Dissolved	nc	0.093	0.11

Notes:
mg/L = Milligrams per liter.

[a] Source: USEPA Ambient Water Quality Criteria - Freshwater Chronic Value. *Screening Quick Reference Tables (SQuiRTs)* . National Oceanic and Atmospheric Administration (NOAA), 2000.

Table E-4
Proposed Ambient Levels for Subsurface Water
Northeast Cape, St. Lawrence Island, Alaska

Chemical	NEC Shallow Subsurface Water BUTL	NEC Deep Subsurface Water BUTL	ADEC Table C Concentration [a]
Inorganics, Total (mg/L)			
Aluminum	nc	nc	na
Antimony	nc	nc	na
Arsenic	0.025	nc	0.05
Barium	nc	nc	na
Beryllium	0.021	nc	0.004
Cadmium	0.060	nc	0.005
Chromium	1.7	nc	36.5
Cobalt	0.011	nc	na
Copper	0.087	nc	1.3
Lead	0.013	nc	0.015
Manganese	0.20	nc	na
Mercury	0.00041	nc	0.002
Nickel	0.056	nc	0.1
Selenium	nc	nc	na
Silver	nc	nc	na
Thallium	nc	nc	na
Vanadium	0.097	nc	0.26
Zinc	0.29	nc	11
Inorganics, Dissolved (mg/L)			
Antimony, Dissolved	nc	nc	na
Arsenic, Dissolved	0.015	nc	0.05
Beryllium, Dissolved	nc	nc	na
Cadmium, Dissolved	nc	nc	na
Chromium, Dissolved	nc	nc	na
Copper, Dissolved	nc	nc	na
Lead, Dissolved	nc	nc	na
Mercury, Dissolved	nc	nc	na
Nickel, Dissolved	nc	nc	na
Selenium, Dissolved	nc	nc	na
Silver, Dissolved	nc	nc	na
Thallium, Dissolved	nc	nc	na
Zinc, Dissolved	nc	nc	na

Notes:
mg/L = Milligrams per liter.
[a] Source: ADEC Table C Groundwater Cleanup Levels (18 AAC 75.345).

Section 1

MWH

1.0 INTRODUCTION

On behalf of the United States Army Engineer District, Alaska, MWH Americas, Inc. (MWH) developed ambient levels for abiotic media associated with the Northeast Cape, St. Lawrence Island, Alaska. Ambient levels were developed for the Northeast Cape Site, Pursuant to Contract No. DACA85-98-D-0007, in support of human health and ecological risk assessments conducted under the Phase III Remedial Investigation for Northeast Cape. This technical memorandum documents the methods used and results of ambient level development for inorganic chemicals present in abiotic media associated with the site. The ambient levels described herein will be used to screen chemicals of potential concern (COPCs) and chemicals of potential ecological concern (COPECs) during screening phases of the human health and ecological risk assessments for Northeast Cape.

1.1 PURPOSE AND SCOPE

Ambient levels were previously developed for Northeast Cape, as documented in the *Draft 2001 Phase III Remedial Investigation and Risk Assessment Update, Northeast Cape, St. Lawrence Island, Alaska* (MWH, 2002). Previous ambient levels were calculated using the results of environmental samples collected from locations of the site believed unimpacted by site contaminants. 'Ambient' samples included ten soil samples, five sediment samples, three surface water samples and four shallow groundwater samples. Comments on the Draft 2001 Phase III Remedial Investigation and Risk Assessment report expressed concerns over the quantity and quality of ambient data collected for Northeast Cape, and the extent of documentation supporting development of ambient concentrations. Consequently, ambient levels for Northeast Cape were reevaluated. Abiotic media for which updated ambient levels were developed include the following:

- Tundra soil;
- Gravel soil;
- Freshwater sediment
- Fresh surface water;
- Ephemeral surface water
- Shallow subsurface water; and
- Deep subsurface water.

Ambient levels were developed for tundra soil, freshwater sediment, and ephemeral surface water for use in evaluating contaminant concentrations detected in tundra areas, including streams and ponds, adjacent to and near gravel pads. Ambient levels for gravel soils will be compared to contaminant concentrations detected in materials constructed from gravel including roads, building and tank pads, and landfill cover material. Ambient levels for subsurface water will be used to evaluate potential contamination in groundwater potentially used as a drinking water resource.

Ambient levels were not developed for organic chemicals, or for biotic media, consistent with *Technical Guidance Document on Determination of Background Concentrations* (ADEC, 1998).

Potential regional contamination associated with organic chemicals and biotic media (e.g., plants or fish) is beyond the scope of this technical memorandum and will be evaluated in the revised baseline human health and ecological risk assessment for Northeast Cape.

Section 2

MWH

2.0 METHODS

Statistical methods used in the derivation of ambient levels for Northeast Cape are described in the following subsections. The general approach that was used is described in Section 2.1, and the data sets and statistical evaluations specific to each abiotic medium are presented in Sections 2.2 through 2.8.

2.1 GENERAL

The general approach that was used to derive ambient levels for Northeast Cape is as follows. First, site-wide analytical results for inorganic chemicals in abiotic media were grouped by sample location and type into one of the seven media categories identified in Section 1.1. Then the overall quality of the data and adequacy of chemical reporting limits was evaluated. Next, the distribution of the data for each inorganic chemical was evaluated to determine whether the data population is normally or lognormally distributed, as described in Gilbert (1987). Consistent with methods described in Gilbert (1987) and USEPA (2001), the Shapiro-Wilkes test was used for data sets containing less than 50 sampling results, and D'Agostino's test was used for data sets comprised of 50 or more results. An extreme test was then performed on data for a given inorganic chemical and medium to identify and eliminate statistical outliers. This test was conducted because outliers may potentially represent anthropogenic (i.e., man-made) sources of contamination. The extreme test was conducted using Grubb's test for outliers based on the normal or log-transformed data, as appropriate, and data were eliminated that exceeded a critical Z value with a 95 % probability (i.e., $p < 0.05$). The distribution of the remaining data set was re-evaluated to determine whether the data population is normally or lognormally distributed. Once the data distribution was determined, the data were plotted on a normal or lognormal probability fit plot to evaluate goodness of fit. That is, breaks in the probability fit distribution may represent multiple populations, as would be expected when both native background concentrations and levels associated with anthropogenic sources are present. If only one population was present, this data set was assumed to represent the ambient population. If more than one population was present, the lower distribution was assumed to represent the ambient population. The assumed ambient population was used to calculate an ambient level for each inorganic chemical and medium, provided there was sufficient data to do so. Data quality considerations are described on a chemical- and medium-specific basis in Section 3.0.

Ambient levels for Northeast Cape were derived by calculating the background upper tolerance limit (BUTL) of the assumed ambient population. The BUTL is the concentration of an element or compound that is believed to represent the upper range of naturally occurring and/or regional ambient values. The 95th percentile/95 percent (95/95) BUTL is the concentration below which 95 percent of background concentrations are expected to fall, with 95 percent confidence. This tolerance coefficient (i.e., 95th percentile) and coverage (i.e., 95 percent) are recommended in USEPA's *Methods for Evaluating the Attainment of Cleanup Standards, Volume I: Soils and Solid Media* (USEPA, 1989), *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, (*Interim Final*) Guidance* (USEPA, 1992), and *Selecting Inorganic Constituents as Chemicals of Potential Concern at Risk Assessments at Hazardous Waste Sites and Permitted Facilities, Final Policy* (Cal/EPA, 1997).

The calculation of the 95/95 BUTL is as follows (USEPA, 1989, 1992):

$$BUTL = X + K \times S$$

Where:

BUTL	=	Background upper tolerance level
X	=	Arithmetic mean
K	=	Tolerance factor for a one-sided tolerance level
S	=	Standard deviation

The tolerance factor "K" used in the calculation of the BUTL varies with the desired level of confidence, the percentage of the population to be included within the calculated range, and the number of samples included in the data set. Tolerance factors for one-sided normal tolerance intervals, with a probability level (i.e., confidence factor) and coverage both equal to 95 percent, are tabulated in *Statistical Methods for Environmental Pollution Monitoring* (Gilbert, 1987).

Inorganic chemicals detected at concentrations above the 95/95 BUTL are considered to represent potential contamination. Implicit in this approach, however, is the fact that this method allows for some exceedances of the BUTL by chance alone. That is, a measured value that exceeds the 95/95 BUTL could be representative of a high background level value with a low probability of occurring (e.g., the upper 5 percent of the ambient population) rather than a level representative of contamination.

2.2 SOIL TUNDRA

Media designated as tundra soil tundra consist of soil samples collected from off-pad locations in the tundra. These samples include saturated and unsaturated soils, including soils that underlie ephemeral surface water bodies. These soils are considered native to the location where they were collected.

2.3 SOIL GRAVEL

Media in this category consist of samples collected from the gravel pads deposited on the tundra during construction of the installation. These soils consist of borrow material from regional gravel pit(s), crushed rock and/or beach materials and deposited at the site and therefore may have a unique makeup. This category also includes the samples of gravel beach materials at Site 4 and the native rock/gravel at sites located on the mountain (e.g., Sites 30-34). The gravel is differentiated from tundra soils because they:

- May have different physical and chemical characteristics than tundra soils;
- Support different vegetative and wildlife communities; and
- Have different surface and subsurface water migration patterns.

2.4 FRESH WATER SEDIMENT

Media in this category consist of sediments associated with permanent fresh surface water bodies. It includes all sediments within the seasonal high water level of the fresh water body (e.g., Suqitughneq River, drainage basin). This category includes sediments in estuary areas that are primarily fresh water, but that may be temporarily influenced by marine surface water on occasions such as large storm events (e.g., the estuary at the outlet of the Suqitughneq River).

2.5 FRESH SURFACE WATER

Fresh surface water consists of water samples collected from permanent fresh surface water bodies and/or surface water bodies that potentially support water column or benthic organisms. This includes the Suqitughneq River, permanent freshwater ponds, drainage basin and surface water in estuary areas that are primarily fresh water, but that may be temporarily influenced by marine surface water on rare occasions such as large storm events (e.g., the estuary at the outlet of the Suqitughneq River).

2.6 EPHEMERAL SURFACE WATER

Ephemeral surface water consists of fresh water collected from intermittent surface water bodies. Water from these locations is potential terrestrial and/or wetland habitat depending on quantity of precipitation during the short summer season. It is not considered aquatic habitat, nor do they support water column or benthic organisms.

2.7 SHALLOW SUBSURFACE WATER

Media in this category consist of water samples collected from monitoring wells or well points installed above the fractured bedrock layer encountered at various locations across the installation. Water collected from these locations consists of seasonally-thawed subsurface water that has been found to be intermittent across areas of the site. It may also consist of permanently thawed subsurface water in thaw bulbs.

2.8 DEEP SUBSURFACE WATER

Deep surface water consists of water samples collected from the four deep drinking water wells at the installation prior to their decommissioning and removal. The water levels were typically about 70 feet above mean sea level in 2001. The well depths measured about 40-60 feet below ground surface. Based on subsurface investigations in the area, these wells accessed the deep subsurface water in or below the fractured bedrock.

Section 3

MWH

3.0 RESULTS

The derivation of ambient levels for Northeast Cape is described in this section, by medium and chemical.

3.1 SOIL TUNDRA

Summary statistics and derived ambient levels, in the form of 95/95 BUTLs, for tundra soils are presented in Table 3-1. Results of the statistical analyses for each inorganic chemical are described in detail in the following subsections.

3.1.1 Aluminum

A total of 25 samples were included in the aluminum data set for tundra soil, with 21 detections and a maximum detected concentration of 33,100 mg/kg (Table 3-1). No statistical outliers were identified, based on the Grubb's test, and the normal distribution showed goodness of fit, with an r^2 value of 0.93. The 95/95 BUTL for aluminum in tundra soils was calculated as 30,357 mg/kg (Table 3-1).

3.1.2 Antimony

A total of 78 samples were evaluated in the data set for antimony; however, there were only four detections (Table 3-1). The data were deemed to be insufficient for the derivation of a 95/95 BUTL, due to the low frequency of detection. Therefore, an ambient level for antimony in tundra soils is not proposed.

3.1.3 Arsenic

A total of 65 samples were evaluated in the original arsenic data set for tundra soil, with 52 detections (Table 3-1). No statistical outliers were identified, based on the Grubb's test. However, a probability fit plot of the lognormal distribution (Figure B-1.1) included an inflection at 7.9 mg/kg, suggesting that the data set may contain two distributions; a lower distribution representing ambient conditions and an upper distribution representing possible anthropogenic sources. Consequently, values greater than 7.9 mg/kg were eliminated from the arsenic data set and the remaining data were further evaluated. The remaining data were determined to be normally distributed, and showed goodness of fit, with an r^2 value of 0.96. The 95/95 BUTL for arsenic in tundra soils was calculated as 7.8 mg/kg (Table 3-1).

3.1.4 Barium

A total of 28 samples were evaluated in the original data set for barium, with 23 detections (Table 3-1). No statistical outliers were identified, based on the Grubb's test. However, a probability fit plot of the normal distribution (Figure B-1.2) showed a deviation in the lower portion of the distribution that corresponds to four non-detect results. Consequently, the data set was Windsorized according to methods described in Gilbert (1987), and the four upper and four

lower values were eliminated from the data set. The remaining data were determined to be normally distributed, and showed goodness of fit, with an r^2 value of 0.97. The 95/95 BUTL for barium in tundra soils was calculated as 174 mg/kg (Table 3-1).

3.1.5 Beryllium

A total of 78 samples were evaluated in the original data set for beryllium, with 25 detections (Table 3-1). The highest value was identified as a statistical outlier, based on the Grubb's test, and was eliminated from the data set. The remaining data were determined to be lognormally distributed and showed goodness of fit, with an r^2 value of 0.93. The 95/95 BUTL for beryllium in tundra soils was calculated as 3.8 mg/kg (Table 3-1).

3.1.6 Cadmium

A total of 79 original samples were evaluated in the tundra soils data set for cadmium, with 22 detections (Table 3-1). The probability fit plot of the lognormal distribution (Figure B-1.3) suggested the presence of three separate distributions, with inflections at 0.225 mg/kg and 1.8 mg/kg. Values below 0.225 mg/kg were non-detect and values above 1.8 mg/kg were suggestive of a potential anthropogenic source of cadmium. Consequently, data between these values were evaluated further. These data were normally distributed and showed goodness of fit, with an r^2 value of 0.91. The 95/95 BUTL for cadmium in tundra soils was calculated as 1.4 mg/kg (Table 3-1).

3.1.7 Chromium

A total of 86 samples were evaluated in the chromium data set for tundra soils, with 76 detections (Table 3-1). The three highest values were identified as statistical outliers, as per the Grubb's test, and were eliminated. The remaining data set had a maximum concentration of 65 mg/kg, and the corresponding 95/95 BUTL was calculated as 48 mg/kg (Table 3-1).

3.1.8 Cobalt

A total of 27 samples were evaluated in the cobalt data set for tundra soils, with 23 detections (Table 3-1). There were no statistical outliers, as per the Grubb's test. The data set had a maximum concentration of 38 mg/kg, and the corresponding 95/95 BUTL was calculated as 49 mg/kg (Table 3-1).

3.1.9 Copper

A total of 78 samples were evaluated in the data set for copper, and all were detected results. There were no statistical outliers, as per the Grubb's test. There appeared to be an inflection in the lognormal probability fit plot at 100 mg/kg (Figure B-1.5). Consequently, data greater than 100 mg/kg were eliminated from the data set for copper. The resulting lognormal distribution showed goodness of fit, with an r^2 value of 0.98. The corresponding 95/95 BUTL for copper in tundra soils was calculated as 107 mg/kg (Table 3-1).

3.1.10 Lead

A total of 89 samples were evaluated in the original data set for lead, with 85 detected results. The lowest value was identified as a statistical outlier, as per the Grubb's test. In addition, there appeared to be an inflection in the lognormal probability fit plot at 92 mg/kg (Figure B-1.6). Consequently, data greater than 92 mg/kg were eliminated from the data set for lead. The corresponding 95/95 BUTL for lead in tundra soils was calculated as 106 mg/kg (Table 3-1).

3.1.11 Manganese

A total of 27 samples were evaluated in the original data set for manganese; all were detected results. Although there were no statistical outliers, visual inspection of the data suggested that Windsorizing the two highest and lowest values would reduce the sample variance considerably (Figure B-1.7). The resulting lognormal distribution showed goodness of fit, with an r^2 value of 0.96. The corresponding 95/95 BUTL for manganese in tundra soils was calculated as 1,589 mg/kg (Table 3-1).

3.1.12 Mercury

A total of 65 samples were evaluated in the mercury data set for tundra soils, with 12 detected results. The two highest values and one lowest value were statistical outliers, as per the Grubb's test, and were eliminated. Summary statistics for mercury are presented in Table 3-1. The distribution of the resulting data set for mercury was determined to be lognormal, and the corresponding 95/95 BUTL was calculated as 0.43 mg/kg (Table 3-1).

3.1.13 Nickel

A total of 78 samples were evaluated in the nickel data set for tundra soils, with 55 detections (Table 3-1). The highest value of 280 mg/kg was identified as a statistical outlier, as per the Grubb's test, and was eliminated. The remaining data set had a maximum concentration of 110 mg/kg, and the corresponding 95/95 BUTL was calculated as 59 mg/kg (Table 3-1).

3.1.14 Selenium

A total of 65 samples were evaluated in the selenium data set for tundra soils, with four detected results (Table 3-1). The data were deemed to be insufficient for the derivation of a 95/95 BUTL, due to the low frequency of detection. Therefore, an ambient level for selenium in tundra soils is not proposed.

3.1.15 Silver

A total of 79 samples were evaluated in the silver data set for tundra soils, with five detected results (Table 3-1). The data were deemed to be insufficient for the derivation of a 95/95 BUTL, due to the low frequency of detection. Therefore, an ambient level for silver in tundra soils is not proposed.

3.1.16 Thallium

A total of 78 samples were evaluated in the thallium data set for tundra soils, with 5 detections (Table 3-1). Results based on Method 6010 were associated with elevated reporting limits. However, results based on a more sensitive method for thallium (i.e., Method 7841) were associated with the detections. Therefore, a 95/95 BUTL was derived using results obtained from Method 7841, only. The resulting 95/95 BUTL for thallium was calculated as 1.6 mg/kg (Table 3-1).

3.1.17 Vanadium

A total of 27 samples were included in the vanadium data set for tundra soils, with 26 detections and a maximum detected concentration of 81 mg/kg (Table 3-1). No statistical outliers were identified, based on the Grubb's test, and the normal distribution showed goodness of fit, with an r^2 value of 0.96. The 95/95 BUTL for vanadium in tundra soils was calculated as 73 mg/kg (Table 3-1).

3.1.18 Zinc

A total of 85 samples were evaluated in the zinc data set for tundra soils, and all were detected results. There were no statistical outliers, as per the Grubb's test, however there appeared to be an inflection in the lognormal probability fit plot at 776 mg/kg (Figure B-1.10). Consequently, data greater than 776 mg/kg were eliminated from the data set for zinc. . Summary statistics for zinc are presented in Table 3-1. The distribution of the data set for zinc was determined to be lognormal, and the corresponding 95/95 BUTL was calculated as 615 mg/kg (Table 3-1).

3.2 SOIL GRAVEL

Insufficient samples (three, or fewer) were available to derive ambient levels for the following inorganic chemicals in gravel soils: aluminum, barium, cobalt, manganese and vanadium (Table 3-2). In addition, detection frequencies were too low to derive ambient levels for the following chemicals: antimony, beryllium, mercury, selenium and silver (Table 3-2). Ambient levels were derived for eight metals including arsenic, cadmium, chromium, copper, lead, nickel, thallium and zinc (Table 3-2). Results for these chemicals are described in the following subsections.

3.2.1 Arsenic

A total of 23 samples were evaluated in the arsenic data set for gravel soils, and all were detections (Table 3-2). There were no statistical outliers, as per the Grubb's test. The lognormal distribution showed goodness of fit, with an r^2 value of 0.90. The corresponding 95/95 BUTL for arsenic in gravel soils was calculated as 11 mg/kg (Table 3-2).

3.2.2 Cadmium

A total of 61 samples were evaluated in the cadmium data set for gravel soils, with twenty detected results (Table 3-2). The highest value of 7.2 mg/kg was identified as a statistical

outlier, as per the Grubb's test, and was eliminated. The resulting lognormal distribution showed goodness of fit, with an r^2 value of 0.97. The corresponding 95/95 BUTL for cadmium in gravel soils was calculated as 3.1 mg/kg (Table 3-2).

3.2.3 Chromium

A total of 100 samples were evaluated in the chromium data set for gravel soils, with 99 detected results (Table 3-2). The highest and lowest values were identified as statistical outliers, as per the Grubb's test, and were eliminated. The distribution of the resulting data set for chromium was determined to be lognormal, and the corresponding 95/95 BUTL was calculated as 50 mg/kg (Table 3-2).

3.2.4 Copper

A total of 61 samples were evaluated in the copper data set for gravel soils, and all were detections (Table 3-2). There were no statistical outliers, as per the Grubb's test. The resulting lognormal distribution showed goodness of fit, with an r^2 value of 0.99. The corresponding 95/95 BUTL for copper in gravel soils was calculated as 44 mg/kg (Table 3-2).

3.2.5 Lead

A total of 103 samples were evaluated in the chromium data set for gravel soils, and all were detected results (Table 3-2). There were no statistical outliers, as per the Grubb's test, however there appeared to be an inflection in the lognormal probability fit plot at 125 mg/kg (Figure B-2.3). Consequently, data greater than 125 mg/kg were eliminated from the data set for lead. The distribution of the data set for lead was determined to be lognormal, with an r^2 value of 0.98. The corresponding 95/95 BUTL was calculated as 112 mg/kg (Table 3-2).

3.2.6 Nickel

A total of 61 samples were evaluated in the nickel data set for gravel soils, with 57 detected results (Table 3-2). . The distribution of the data set for nickel was determined to be lognormal. There were no statistical outliers, as per the Grubb's test, and the corresponding 95/95 BUTL was calculated as 30 mg/kg (Table 3-2).

3.2.7 Thallium

A total of 61 samples were evaluated in the thallium data set for gravel soils, with six detections (Table 3-2). Results based on Method 6010 were associated with elevated reporting limits. However, results based on a more sensitive method for thallium (i.e., Method 7841) were associated with the detections. Therefore, a 95/95 BUTL was derived using results obtained from Method 7841, only. The resulting 95/95 BUTL for thallium was calculated as 0.56 mg/kg (Table 3-2).

3.2.8 Zinc

A total of 100 samples were evaluated in the zinc data set for gravel soils, and all were detected results (Table 3-2). The highest value of 12,100 mg/kg was identified as a statistical outlier, as per the Grubb's test, and was eliminated. In addition, there appeared to be an inflection in the lognormal probability fit plot at 183 mg/kg (Figure B-2.4). Consequently, data greater than 183 mg/kg were eliminated from the data set for zinc. The distribution of the resulting data set for zinc was determined to be lognormal, with an r^2 value of 0.98. The corresponding 95/95 BUTL was calculated as 157 mg/kg (Table 3-2).

3.3 FRESH WATER SEDIMENT

Insufficient samples (i.e., a maximum of five) were available to derive ambient levels for the following inorganic chemicals in gravel soils: aluminum, arsenic, barium, cobalt, manganese, mercury, selenium and vanadium (Table 3-3). In addition, detection frequencies were too low to derive ambient levels for the following chemicals: antimony, cadmium, silver and thallium (Table 3-3). Ambient levels were derived for six metals including beryllium, chromium, copper, lead, nickel and zinc (Table 3-3). Results for these chemicals are described in the following subsections.

3.3.1 Beryllium

A total of nine samples were evaluated in the beryllium data set for freshwater sediments, with five detected results (Table 3-3). The distribution of the data set for beryllium was determined to be lognormal. There were no statistical outliers, as per the Grubb's test, and the corresponding 95/95 BUTL was calculated as 9.8 mg/kg (Table 3-3).

3.3.2 Chromium

A total of 86 samples were evaluated in the chromium data set for freshwater sediments, and 85 were detected results (Table 3-3). The highest two values were identified as statistical outliers, as per the Grubb's test, and were eliminated. The distribution of the resulting data set for chromium was determined to be normal, with an r^2 value of 0.98. The corresponding 95/95 BUTL was calculated as 34 mg/kg (Table 3-3).

3.3.3 Copper

A total of nine samples were evaluated in the copper data set for freshwater sediments, and all were detected results (Table 3-3). There were no statistical outliers, as per the Grubb's test. The distribution of the resulting data set for copper was determined to be normal, and the corresponding 95/95 BUTL was calculated as 40 mg/kg (Table 3-3).

3.3.4 Lead

A total of 86 samples were evaluated in the lead data set for freshwater sediments, and 73 were detected results (Table 3-3). The highest value of 4,590 mg/kg was identified as a statistical

outlier, as per the Grubb's test, and was eliminated. In addition, there appeared to be an inflection in the lognormal probability fit plot at 113 mg/kg (Figure B-3.4). Consequently, data greater than 113 mg/kg were eliminated from the data set for lead. The distribution of the resulting data set for lead was determined to be lognormal, with an r^2 value of 0.98. The corresponding 95/95 BUTL was calculated as 78 mg/kg (Table 3-3).

3.3.5 Nickel

A total of nine samples were evaluated in the lead data set for freshwater sediments, with six detected results (Table 3-3). The distribution of the data set for nickel was determined to be lognormal. There were no statistical outliers, as per the Grubb's test, and the corresponding 95/95 BUTL was calculated as 126 mg/kg (Table 3-3).

3.3.6 Zinc

A total of 86 samples were evaluated in the zinc data set for freshwater sediments, and all were detected results (Table 3-3). The two highest values were identified as statistical outliers, as per the Grubb's test, and were eliminated. In addition, there appeared to be an inflection in the lognormal probability fit plot at 148 mg/kg (Figure B-3.6). Consequently, data greater than 148 mg/kg were eliminated from the data set for zinc. The distribution of the resulting data set for zinc was determined to be lognormal, with an r^2 value of 0.98. The corresponding 95/95 BUTL was calculated as 148 mg/kg (Table 3-3).

3.4 FRESH SURFACE WATER

A maximum of four to eight fresh surface water samples were collected for any given inorganic chemical, and detections ranged from none to a maximum of four (Table 3-4). As a result, fresh surface water data sets were deemed insufficient for derivation of ambient levels. Consequently, no ambient levels for inorganic chemicals in fresh surface water are proposed at this time.

3.5 EPHEMERAL SURFACE WATER

There were a maximum of 26 samples of ephemeral surface water available for any given inorganic chemical, and a minimum of nine samples (Table 3-5). However, there were no detections of the following inorganic chemicals in ephemeral surface water: antimony, beryllium, cadmium, cobalt, mercury, selenium, silver and vanadium. In addition, the following inorganic chemicals were detected at frequencies too low to allow the derivation of a meaningful 95/95 BUTL: arsenic, chromium, nickel and thallium. Sufficient data were available for the derivation of ambient levels for aluminum, barium, copper, lead, manganese, and zinc (Table 3-5). Results for these chemicals are described in the following subsections.

3.5.1 Aluminum, Total

A total of 13 samples were evaluated in the total aluminum data set for ephemeral surface water, with 12 detected results (Table 3-5). The distribution of the data set for total aluminum was

determined to be lognormal. There were no statistical outliers, as per the Grubb's test, and the corresponding 95/95 BUTL was calculated as 2.2 mg/L (Table 3-5).

3.5.2 Barium, Total

A total of 13 samples were evaluated in the total barium data set for ephemeral surface water, with 12 detected results (Table 3-5). The distribution of the data set for total barium was determined to be lognormal, with an r^2 value of 0.96. There were no statistical outliers, as per the Grubb's test. The corresponding 95/95 BUTL was calculated as 0.034 mg/L (Table 3-5).

3.5.3 Copper, Total

A total of 26 samples were evaluated in the total copper data set for ephemeral surface water, with 6 detected results (Table 3-5). The distribution of the data set for total copper was determined to be lognormal. There were no statistical outliers, as per the Grubb's test, and the corresponding 95/95 BUTL was calculated as 0.083 mg/L (Table 3-5).

3.5.4 Lead, Total

A total of 26 samples were evaluated in the total lead data set for ephemeral surface water, with 14 detected results (Table 3-5). The highest value of 0.065 mg/L was identified as a statistical outlier, as per the Grubb's test, and was eliminated. The distribution of the resulting data set for total lead was determined to be lognormal, and the corresponding 95/95 BUTL was calculated as 0.014 mg/L (Table 3-5).

3.5.5 Manganese, Total

A total of 13 samples were evaluated in the total manganese data set for ephemeral surface water, and all were detected results (Table 3-5). There were no statistical outliers, as per the Grubb's test however, there appeared to be an inflection in the lognormal probability fit plot at 0.029 mg/L (Figure B-4.4). Consequently, data greater than 0.029 mg/L were eliminated from the data set for manganese. The distribution of the resulting data set for total manganese was determined to be lognormal, and the corresponding 95/95 BUTL was calculated as 0.12 mg/L (Table 3-5).

3.5.6 Zinc, Total

A total of 26 samples were evaluated in the total zinc data set for ephemeral surface water, with 13 detected results (Table 3-5). The distribution of the data set for total zinc was lognormal. There were no statistical outliers, as per the Grubb's test, and the corresponding 95/95 BUTL was calculated as 0.90 mg/L (Table 3-5).

3.5.7 Zinc, Dissolved

A total of 13 samples were evaluated in the dissolved zinc data set for ephemeral surface water, with 5 detected results (Table 3-5). The highest value of 0.49 mg/L was identified as a statistical

outlier, as per the Grubb's test, and was eliminated. The distribution of the resulting data set for dissolved zinc was determined to be normal, with an r^2 value of 0.98. The corresponding 95/95 BUTL was calculated as 0.093 mg/L (Table 3-5).

3.6 SHALLOW SUBSURFACE WATER

A maximum of 29 samples of shallow subsurface water were available for any given inorganic chemical, and a minimum of eight samples were available (Table 3-6). There were no detections of selenium or silver in shallow subsurface water. In addition, the following inorganic chemicals were detected at frequencies too low to allow the derivation of a meaningful 95/95 BUTL: aluminum, antimony, barium and thallium. Sufficient data were available for the derivation of ambient levels for arsenic, beryllium, cadmium, chromium, cobalt, copper, lead, manganese, mercury, nickel, vanadium and zinc (Table 3-6). Results for these chemicals are described in the following subsections.

3.6.1 Arsenic, Total

A total of 21 samples were evaluated in the original data set for total arsenic data in shallow subsurface water, with 18 detections (Table 3-6). There were no statistical outliers, based on the Grubb's test. However, a probability fit plot of the lognormal distribution (Figure B-5.2) included an inflection at 0.012 mg/L, suggesting that the data set may contain two distributions; a lower distribution representing ambient conditions and an upper distribution representing possible anthropogenic sources. Consequently, values greater than 0.012 mg/L were eliminated from the data set and the remaining data were further evaluated. The remaining data were determined to be lognormally distributed, and showed goodness of fit, with an r^2 value of 0.97. The 95/95 BUTL for total arsenic in shallow subsurface groundwater was calculated as 0.025 mg/L (Table 3-6).

3.6.2 Beryllium, Total

A total of 29 samples were evaluated in the original data set for total beryllium in shallow subsurface water, with 8 detections (Table 3-6). The highest value of 0.040 mg/L was identified as a statistical outlier, based on the Grubb's test, and was eliminated. The remaining data were determined to be normally distributed, and showed goodness of fit, with an r^2 value of 0.99. The 95/95 BUTL for total beryllium in shallow subsurface groundwater was calculated as 0.021 mg/L (Table 3-6).

3.6.3 Cadmium, Total

A total of 29 samples were evaluated in the original data set for total cadmium in shallow subsurface water, with 4 detections (Table 3-6). The data were determined to be lognormally distributed, and showed goodness of fit, with an r^2 value of 0.96. There were no statistical outliers, based on the Grubb's test. The 95/95 BUTL for total cadmium in shallow subsurface groundwater was calculated as 0.060 mg/L (Table 3-6).

3.6.4 Chromium, Total

A total of 29 samples were evaluated in the original data set for total chromium in shallow subsurface water, with 22 detections (Table 3-6). The data were determined to be lognormally distributed, and showed goodness of fit, with an r^2 value of 0.98. There were no statistical outliers, based on the Grubb's test. The 95/95 BUTL for total chromium in shallow subsurface water was calculated as 1.7 mg/L (Table 3-6).

3.6.5 Cobalt, Total

A total of 8 samples were evaluated in the original data set for total cobalt in shallow subsurface water, with 7 detections (Table 3-6). There were no statistical outliers, based on the Grubb's test. However, a probability fit plot of the lognormal distribution (Figure B-5.7) included an inflection at 0.005 mg/L, suggesting that the data set may contain two distributions; a lower distribution representing ambient conditions and an upper distribution representing possible anthropogenic sources. Consequently, values greater than 0.005 mg/L were eliminated from the data set and the remaining data were further evaluated. The remaining data were determined to be normally distributed, and the 95/95 BUTL for total cobalt in shallow subsurface water was calculated as 0.011 mg/L (Table 3-6).

3.6.6 Copper, Total

A total of 29 samples were evaluated in the original data set for total copper in shallow subsurface water, with 25 detections (Table 3-6). There were no statistical outliers, based on the Grubb's test. However, a probability fit plot of the lognormal distribution (Figure B-5.8) included an inflection at 0.068 mg/L, suggesting that the data set may contain two distributions; a lower distribution representing ambient conditions and an upper distribution representing possible anthropogenic sources. Consequently, values greater than 0.068 mg/L were eliminated from the data set and the remaining data were further evaluated. The remaining data were determined to be normally distributed, and the 95/95 BUTL for total copper in shallow subsurface water was calculated as 0.087 mg/L (Table 3-6).

3.6.7 Lead, Total

A total of 31 samples were evaluated in the original data set for total lead in shallow subsurface water, and all were detections (Table 3-6). There were no statistical outliers, based on the Grubb's test. However, a probability fit plot of the lognormal distribution (Figure B-5.9) included an inflection at 0.008 mg/L, suggesting that the data set may contain two distributions; a lower distribution representing ambient conditions and an upper distribution representing possible anthropogenic sources. Consequently, values greater than 0.008 mg/L were eliminated from the data set and the remaining data were further evaluated. The remaining data were determined to be normally distributed, and showed goodness of fit, with an r^2 value of 0.96. The 95/95 BUTL for total lead in shallow subsurface water was calculated as 0.013 mg/L (Table 3-6).

3.6.8 Manganese, Total

A total of 10 samples were evaluated in the original data set for total manganese in shallow subsurface water, and all were detections (Table 3-6). There were no statistical outliers, based on the Grubb's test. However, a probability fit plot of the lognormal distribution (Figure B-5.10) included an inflection at 0.105 mg/L, suggesting that the data set may contain two distributions; a lower distribution representing ambient conditions and an upper distribution representing possible anthropogenic sources. Consequently, values greater than 0.105 mg/L were eliminated from the data set and the remaining data were further evaluated. The remaining data were determined to be normally distributed, and the 95/95 BUTL for total manganese in shallow subsurface water was calculated as 0.20 mg/L (Table 3-6).

3.6.9 Mercury, Total

A total of 21 samples were evaluated in the original data set for total mercury in shallow subsurface water, with 7 detections (Table 3-6). The highest value of 0.0006 mg/L was identified as a statistical outlier, based on the Grubb's test, and was eliminated. The remaining data were determined to be normally distributed, and the 95/95 BUTL for total mercury in shallow subsurface water was calculated as 0.00041 mg/L (Table 3-6).

3.6.10 Nickel, Total

A total of 29 samples were evaluated in the original data set for total nickel in shallow subsurface water, with 17 detections (Table 3-6). There were no statistical outliers, based on the Grubb's test. However, a probability fit plot of the lognormal distribution (Figure B-5.11) included an inflection at 0.0475 mg/L, suggesting that the data set may contain two distributions; a lower distribution representing ambient conditions and an upper distribution representing possible anthropogenic sources. Consequently, values greater than 0.0475 mg/L were eliminated from the data set and the remaining data were further evaluated. The remaining data were determined to be normally distributed, with an r^2 value of 1.0. The 95/95 BUTL for total nickel in shallow subsurface water was calculated as 0.056 mg/L (Table 3-6).

3.6.11 Vanadium, Total

A total of 8 samples were evaluated in the original data set for total vanadium in shallow subsurface water, with 7 detections (Table 3-6). There were no statistical outliers, based on the Grubb's test. However, a probability fit plot of the normal distribution (Figure B-5.12) included an inflection at 0.035 mg/L, suggesting that the data set may contain two distributions; a lower distribution representing ambient conditions and an upper distribution representing possible anthropogenic sources. Consequently, values greater than 0.035 mg/L were eliminated from the data set and the remaining data were further evaluated. The remaining data were determined to be normally distributed, and the 95/95 BUTL for total vanadium in shallow subsurface water was calculated as 0.097 mg/L (Table 3-6).

3.6.12 Zinc, Total

A total of 29 samples were evaluated in the original data set for total zinc in shallow subsurface water, with 24 detections (Table 3-6). There were no statistical outliers, based on the Grubb's test. However, a probability fit plot of the lognormal distribution (Figure B-5.13) included an inflection at 0.235 mg/L, suggesting that the data set may contain two distributions; a lower distribution representing ambient conditions and an upper distribution representing possible anthropogenic sources. Consequently, values greater than 0.235 mg/L were eliminated from the data set and the remaining data were further evaluated. The remaining data were determined to be normally distributed, and the 95/95 BUTL for total zinc in shallow subsurface water was calculated as 0.29 mg/L (Table 3-6).

3.6.13 Arsenic, Dissolved

A total of 13 samples were evaluated in the original data set for dissolved arsenic in shallow subsurface water, with 3 detections (Table 3-6). The data were determined to be lognormally distributed, and showed goodness of fit, with an r^2 value of 0.98. There were no statistical outliers, based on the Grubb's test. The 95/95 BUTL for dissolved arsenic in shallow subsurface groundwater was calculated as 0.015 mg/L (Table 3-6).

3.7 DEEP SUBSURFACE WATER

The only analytes detected in deep subsurface water were total manganese and dissolved manganese. Insufficient data were available to calculate ambient levels for this chemical (Table 3-7).

Table 3-1
Summary Statistics and Derived BUTLs for Soil Tundra
Northeast Cape, St. Lawrence Island, Alaska

	All data				Outliers Removed								
										Z-score Plots			
	Number of results	Number of detects	Max detect	Min result	Stdev	Mean	CV	Shapiro-Wilks Test[a]	D'Agostino's Test[b]	Normal r^2	Lognormal r^2	Assumed Distribution	95/95 BUTL
Inorganics, Total (mg/kg)													
Aluminum	25	21	33,100	0.0000036	8,638	10,558	0.82	Normal	na	0.93	0.58	Normal	30,357
Antimony	78	4	70	<6	nc	nc	nc	na	na	nc	nc	nc	nc[c]
Arsenic	65	52	170	<0.1	2.2	3.4	0.65	na	Normal	0.96	0.84	Normal	7.8
Barium	28	23	193	0.83	42	72	0.59	Normal	na	0.97	0.69	Normal	174
Beryllium	78	25	3.6	0.30	1.2	1.4	0.90	na	Inconclusive	0.63	0.93	Lognormal	3.8
Cadmium	79	22	69	<0.005	0.23	0.95	0.24	na	Inconclusive	0.91	0.83	Normal	1.4
Chromium	86	76	100	<0.01	15	19	0.77	na	Inconclusive	0.89	0.74	Normal	48
Cobalt	27	23	38	2.0	8.4	8.5	0.99	Lognormal	na	0.78	0.98	Lognormal	49
Copper	78	78	429	2.0	25	27	0.94	na	Lognormal	0.78	0.98	Lognormal	107
Lead	89	85	630	<0.03	22	30	0.73	na	Lognormal	0.89	0.98	Lognormal	106
Manganese	27	27	970	8.0	231	280	0.82	Lognormal	na	0.86	0.96	Lognormal	1,589
Mercury	65	12	4.8	<0.0002	0.13	0.12	1.1	na	Inconclusive	0.75	0.93	Lognormal	0.43
Nickel	78	55	280	3.8	16	14	1.1	na	Lognormal	0.70	0.98	Lognormal	59
Selenium	65	4	2.0	<0.1	nc	nc	nc	na	na	nc	nc	nc	nc[c]
Silver	79	5	6.7	<0.01	nc	nc	nc	na	na	nc	nc	nc	nc[c]
Thallium	78	5	1.2	<0.13	0.35	0.52	0.67	Inconclusive	na	0.94	0.90	Normal	1.6
Vanadium	27	26	81	<3	19	31	0.60	Normal	na	0.96	0.86	Normal	73
Zinc	85	85	2,300	9.0	157	139	1.1	na	Lognormal	0.73	0.99	Lognormal	615

Notes:
ND - Non-detect result
Stdev - Standard deviation
Normal r^2 - Correlation coefficient for the normal plot
Lognormal r^2 - Correlation coefficient for the lognormal plot
95/95 BUTL - 95 percent/95 percent background upper tolerance limit
na - Not applicable.
nc - Not calculated.

[a] The Shapiro-Wilks test is only applicable to data sets of < 50 samples.

[b] D'Agostino's Test is only applicable to data sets of ≥ 50 samples.

[c] A 95/95 BUTL could not be calculated for this analyte due to insufficient data.

Table 3-2
Summary Statistics and Derived BUTLs for Soil - Gravel
Northeast Cape, St. Lawrence Island, Alaska

	All data				Outliers Removed								
										Z-score Plots			
	Number of results	Number of detects	Max detect	Min result	Stdev	Mean	CV	Shapiro-Wilks Test[a]	D'Agostino's Test[b]	Normal r^2	Lognormal r^2	Assumed Distribution	95/95 BUTL
Inorganics, Total (mg/kg)													
Aluminum	2	2	13,200	7,790	nc	nc	nc	na	na	nc	nc	nc	nc[c]
Antimony	61	4	34	<2.9	nc	nc	nc	na	na	nc	nc	nc	nc[c]
Arsenic	23	23	12	1.6	2.0	4.7	0.42	Lognormal	na	0.76	0.90	Lognormal	11
Barium	3	3	85	53	nc	nc	nc	na	na	nc	nc	nc	nc[c]
Beryllium	61	7	1.8	0.60	nc	nc	nc	na	na	nc	nc	nc	nc[c]
Cadmium	61	20	7.2	0.31	0.64	1.3	0.49	na	Inconclusive	0.92	0.97	Lognormal	3.1
Chromium	100	99	147	<2	14	18	0.74	na	Lognormal	0.74	0.98	Lognormal	50
Cobalt	3	3	11	2	nc	nc	nc	na	na	nc	nc	nc	nc[c]
Copper	61	61	65	6.1	10	19	0.55	na	Lognormal	0.83	0.99	Lognormal	44
Lead	103	103	822	7.1	27	35	0.76	na	Inconclusive	0.84	0.98	Lognormal	112
Manganese	3	3	340	73	nc	nc	nc	na	na	nc	nc	nc	nc[c]
Mercury	23	0	ND	<0.04	nc	nc	nc	na	na	nc	nc	nc	nc[c]
Nickel	61	57	31	5.0	5.9	11	0.51	na	Inconclusive	0.92	0.95	Lognormal	30
Selenium	23	0	ND	<0.29	nc	nc	nc	na	na	nc	nc	nc	nc[c]
Silver	61	0	ND	<0.3	nc	nc	nc	na	na	nc	nc	nc	nc[c]
Thallium	61	6	0.36	<0.12	0.095	0.26	0.37	Normal	na	0.88	0.70	Normal	0.56
Vanadium	3	3	36	16	nc	nc	nc	na	na	nc	nc	nc	nc[c]
Zinc	100	100	12,100	12	35	65	0.54	na	Lognormal	0.88	0.98	Lognormal	157

Notes:
ND - Non-detect result
Stdev - Standard deviation
Normal r^2 - Correlation coefficient for the normal plot
Lognormal r^2 - Correlation coefficient for the lognormal plot
95/95 BUTL - 95 percent/95 percent background upper tolerance limit
na - Not applicable.
nc - Not calculated.

[a] The Shapiro-Wilks test is only applicable to data sets of < 50 samples.

[b] D'Agostino's Test is only applicable to data sets of ≥ 50 samples.

Table 3-2
Summary Statistics and Derived BUTLs for Soil - Gravel
Northeast Cape, St. Lawrence Island, Alaska

	All data				Outliers Removed								
										Z-score Plots			
	Number of results	Number of detects	Max detect	Min result	Stdev	Mean	CV	Shapiro-Wilks Test[a]	D'Agostino's Test[b]	Normal r^2	Lognormal r^2	Assumed Distribution	95/95 BUTL

[c] A 95/95 BUTL could not be calculated for this analyte due to insufficient data.

Table 3-3
Summary Statistics and Derived BUTLs for Freshwater Sediment
Northeast Cape, St. Lawrence Island, Alaska

	All data				Outliers Removed								
										Z-score Plots			
	Number of results	Number of detects	Max detect	Min result	Stdev	Mean	CV	Shapiro-Wilks Test[a]	D'Agostino's Test[b]	Normal r^2	Lognormal r^2	Assumed Distribution	95/95 BUTL
Inorganics, Total													
Aluminum	5	5	21,700	4,820	nc	nc	nc	na	na	nc	nc	nc	nc[c]
Antimony	9	1	50	<5	nc	nc	nc	na	na	nc	nc	nc	nc[c]
Arsenic	5	5	20	2.8	nc	nc	nc	na	na	nc	nc	nc	nc[c]
Barium	5	5	209	40	nc	nc	nc	na	na	nc	nc	nc	nc[c]
Beryllium	9	5	3.3	0.20	0.90	1.1	0.83	Lognormal	na	0.76	0.94	Lognormal	9.8
Cadmium	9	1	4.0	<0.2	nc	nc	nc	na	na	nc	nc	nc	nc[c]
Chromium	86	85	649	2.600	8.4	18	0.47	na	Normal	0.98	0.88	Normal	34
Cobalt	5	5	22	2.0	nc	nc	nc	na	na	nc	nc	nc	nc[c]
Copper	9	9	30	1.8	8.6	14	0.64	Inconclusive	na	0.95	0.87	Normal	40
Lead	86	73	4,590	3.2	21	21	0.97	na	Lognormal	0.75	0.98	Lognormal	78
Manganese	5	5	6,480	80	nc	nc	nc	na	na	nc	nc	nc	nc[c]
Mercury	5	1	0.050	<0.04	nc	nc	nc	na	na	nc	nc	nc	nc[c]
Nickel	9	6	30	5.0	8.9	11	0.84	Lognormal	na	0.88	0.93	Lognormal	126
Selenium	5	0	ND	<5	nc	nc	nc	na	na	nc	nc	nc	nc[c]
Silver	9	0	ND	<0.3	nc	nc	nc	na	na	nc	nc	nc	nc[c]
Thallium	9	1	0.32	0.32	nc	nc	nc	na	na	nc	nc	nc	nc[c]
Vanadium	5	5	48	17	nc	nc	nc	na	na	nc	nc	nc	nc[c]
Zinc	86	86	4,810	12	31	52	0.58	na	Lognormal	0.93	0.98	Lognormal	148

Notes:
ND - Non-detect result
Stdev - Standard deviation
Normal r^2 - Correlation coefficient for the normal plot
Lognormal r^2 - Correlation coefficient for the lognormal plot
95/95 BUTL - 95 percent/95 percent background upper tolerance limit
na - Not applicable.
nc - Not calculated.

[a] The Shapiro-Wilks test is only applicable to data sets of < 50 samples.

[b] D'Agostino's Test is only applicable to data sets of ≥ 50 samples.

Table 3-3
Summary Statistics and Derived BUTLs for Freshwater Sediment
Northeast Cape, St. Lawrence Island, Alaska

	All data				Outliers Removed								
										Z-score Plots			
	Number of results	Number of detects	Max detect	Min result	Stdev	Mean	CV	Shapiro-Wilks Test[a]	D'Agostino's Test[b]	Normal r^2	Lognormal r^2	Assumed Distribution	95/95 BUTL

[c] A 95/95 BUTL could not be calculated for this analyte due to insufficient data.

Table 3-4
Summary Statistics and Derived BUTLs for Fresh Surface Water
Northeast Cape, St. Lawrence Island, Alaska

	All data				Outliers Removed								
										Z-score Plots			
	Number of results	Number of detects	Max detect	Min result	Stdev	Mean	CV	Shapiro-Wilks Test[a]	D'Agostino's Test[b]	Normal r^2	Lognormal r^2	Assumed Distribution	95/95 BUTL
Inorganics, Total (mg/L)													
Aluminum	4	4	0.040	0.040	nc	nc	nc	na	na	nc	nc	nc	nc[c]
Antimony	8	0	ND	<0.05	nc	nc	nc	na	na	nc	nc	nc	nc[c]
Arsenic	4	0	ND	<0.001	nc	nc	nc	na	na	nc	nc	nc	nc[c]
Barium	4	4	0.0050	0.005	nc	nc	nc	na	na	nc	nc	nc	nc[c]
Beryllium	8	0	ND	<0.001	nc	nc	nc	na	na	nc	nc	nc	nc[c]
Cadmium	8	0	ND	<0.002	nc	nc	nc	na	na	nc	nc	nc	nc[c]
Chromium	8	1	0.015	<0.005	nc	nc	nc	na	na	nc	nc	nc	nc[c]
Cobalt	4	0	ND	<0.003	nc	nc	nc	na	na	nc	nc	nc	nc[c]
Copper	8	1	0.040	<0.002	nc	nc	nc	na	na	nc	nc	nc	nc[c]
Lead	8	1	0.086	<0.001	nc	nc	nc	na	na	nc	nc	nc	nc[c]
Manganese	4	4	0.027	0.017	nc	nc	nc	na	na	nc	nc	nc	nc[c]
Mercury	4	0	ND	<0.0001	nc	nc	nc	na	na	nc	nc	nc	nc[c]
Nickel	8	0	ND	<0.01	nc	nc	nc	na	na	nc	nc	nc	nc[c]
Selenium	4	0	ND	<0.002	nc	nc	nc	na	na	nc	nc	nc	nc[c]
Silver	8	0	ND	<0.003	nc	nc	nc	na	na	nc	nc	nc	nc[c]
Thallium	8	0	ND	<0.001	nc	nc	nc	na	na	nc	nc	nc	nc[c]
Vanadium	4	0	ND	<0.003	nc	nc	nc	na	na	nc	nc	nc	nc[c]
Zinc	8	2	0.62	<0.006	nc	nc	nc	na	na	nc	nc	nc	nc[c]
Inorganics, Dissolved (mg/L)													
Antimony, Dissolved	4	0	ND	<0.1	nc	nc	nc	na	na	nc	nc	nc	nc[c]
Beryllium, Dissolved	4	0	ND	<0.02	nc	nc	nc	na	na	nc	nc	nc	nc[c]
Cadmium, Dissolved	4	0	ND	<0.02	nc	nc	nc	na	na	nc	nc	nc	nc[c]
Chromium, Dissolved	4	0	ND	<0.02	nc	nc	nc	na	na	nc	nc	nc	nc[c]

Table 3-4
Summary Statistics and Derived BUTLs for Fresh Surface Water
Northeast Cape, St. Lawrence Island, Alaska

	All data				Outliers Removed								
										Z-score Plots			
	Number of results	Number of detects	Max detect	Min result	Stdev	Mean	CV	Shapiro-Wilks Test[a]	D'Agostino's Test[b]	Normal r^2	Lognormal r^2	Assumed Distribution	95/95 BUTL
Copper, Dissolved	4	0	ND	<0.02	nc	nc	nc	na	na	nc	nc	nc	nc[c]
Lead, Dissolved	4	1	0.011	<0.002	nc	nc	nc	na	na	nc	nc	nc	nc[c]
Nickel, Dissolved	4	0	ND	<0.05	nc	nc	nc	na	na	nc	nc	nc	nc[c]
Silver, Dissolved	4	1	0.020	0.020	nc	nc	nc	na	na	nc	nc	nc	nc[c]
Thallium, Dissolved	4	0	ND	<0.001	nc	nc	nc	na	na	nc	nc	nc	nc[c]
Zinc, Dissolved	4	1	0.23	<0.05	nc	nc	nc	na	na	nc	nc	nc	nc[c]

Notes:
ND - Non-detect result
Stdev - Standard deviation
Normal r^2 - Correlation coefficient for the normal plot
Lognormal r^2 - Correlation coefficient for the lognormal plot
95/95 BUTL - 95 percent/95 percent background upper tolerance limit
na - Not applicable.
nc - Not calculated.

[a] The Shapiro-Wilks test is only applicable to data sets of < 50 samples.

[b] D'Agostino's Test is only applicable to data sets of ≥ 50 samples.

[c] A 95/95 BUTL could not be calculated for this analyte due to insufficient data.

Table 3-5
Summary Statistics and Derived BUTLs for Ephemeral Surface Water
Northeast Cape, St. Lawrence Island, Alaska

	All data				Outliers Removed								
										Z-score Plots			
	Number of results	Number of detects	Max detect	Min result	Stdev	Mean	CV	Shapiro-Wilks Test[a]	D'Agostino's Test[b]	Normal r^2	Lognormal r^2	Assumed Distribution	95/95 BUTL
Inorganics, Total (mg/L)													
Aluminum	13	12	0.71	<0.02	0.19	0.17	1.1	Lognormal	na	0.75	0.98	Lognormal	2.2
Antimony	26	0	ND	<0.05	nc	nc	nc	na	na	nc	nc	nc	nc[c]
Arsenic	22	3	0.017	<0.001	nc	nc	nc	na	na	nc	nc	nc	nc[c]
Barium	13	12	0.020	0.0030	0.0047	0.0073	0.65	Lognormal	na	0.85	0.96	Lognormal	0.034
Beryllium	26	0	ND	<0.001	nc	nc	nc	na	na	nc	nc	nc	nc[c]
Cadmium	26	0	ND	<0.002	nc	nc	nc	na	na	nc	nc	nc	nc[c]
Chromium	26	1	0.020	<0.005	nc	nc	nc	na	na	nc	nc	nc	nc[c]
Cobalt	13	0	ND	<0.003	nc	nc	nc	na	na	nc	nc	nc	nc[c]
Copper	26	6	0.075	0.0020	0.015	0.0095	1.5	Inconclusive	na	0.56	0.92	Lognormal	0.083
Lead	26	14	0.065	0.00075	0.0025	0.0024	1.1	Inconclusive	na	0.77	0.93	Lognormal	0.014
Manganese	13	13	0.69	0.0010	0.0086	0.011	0.76	Inconclusive	na	0.87	0.89	Lognormal	0.12
Mercury	22	0	ND	<0.0001	nc	nc	nc	na	na	nc	nc	nc	nc[c]
Nickel	26	1	0.053	<0.01	nc	nc	nc	na	na	nc	nc	nc	nc[c]
Selenium	22	0	ND	<0.002	nc	nc	nc	na	na	nc	nc	nc	nc[c]
Silver	26	0	ND	<0.003	nc	nc	nc	na	na	nc	nc	nc	nc[c]
Thallium	26	1	0.0024	<0.001	nc	nc	nc	na	na	nc	nc	nc	nc[c]
Vanadium	13	0	ND	<0.003	nc	nc	nc	na	na	nc	nc	nc	nc[c]
Zinc	26	13	0.81	<0.006	0.18	0.084	2.1	Inconclusive	na	0.48	0.95	Lognormal	0.90
Inorganics, Dissolved													
Antimony, Dissolved	13	0	ND	<0.1	nc	nc	nc	na	na	nc	nc	nc	nc[c]
Arsenic, Dissolved	9	0	ND	<0.005	nc	nc	nc	na	na	nc	nc	nc	nc[c]
Beryllium, Dissolved	13	0	ND	<0.02	nc	nc	nc	na	na	nc	nc	nc	nc[c]
Cadmium, Dissolved	13	0	ND	<0.02	nc	nc	nc	na	na	nc	nc	nc	nc[c]
Chromium, Dissolved	13	0	ND	<0.02	nc	nc	nc	na	na	nc	nc	nc	nc[c]
Copper, Dissolved	13	0	ND	<0.02	nc	nc	nc	na	na	nc	nc	nc	nc[c]

Table 3-5
Summary Statistics and Derived BUTLs for Ephemeral Surface Water
Northeast Cape, St. Lawrence Island, Alaska

	All data				Outliers Removed								
										Z-score Plots			
	Number of results	Number of detects	Max detect	Min result	Stdev	Mean	CV	Shapiro-Wilks Test[a]	D'Agostino's Test[b]	Normal r^2	Lognormal r^2	Assumed Distribution	95/95 BUTL
Lead, Dissolved	13	0	ND	<0.002	nc	nc	nc	na	na	nc	nc	nc	nc[c]
Mercury, Dissolved	9	1	0.00038	0.00038	nc	nc	nc	na	na	nc	nc	nc	nc[c]
Nickel, Dissolved	13	0	ND	<0.05	nc	nc	nc	na	na	nc	nc	nc	nc[c]
Selenium, Dissolved	9	0	ND	<0.005	nc	nc	nc	na	na	nc	nc	nc	nc[c]
Silver, Dissolved	13	0	ND	<0.02	nc	nc	nc	na	na	nc	nc	nc	nc[c]
Thallium, Dissolved	13	1	0.0012	0.0012	nc	nc	nc	na	na	nc	nc	nc	nc[c]
Zinc, Dissolved	13	5	0.49	<0.05	0.020	0.038	0.52	Inconclusive	na	0.98	0.97	Normal	0.093

Notes:
ND - Non-detect result
Stdev - Standard deviation
Normal r2 - Correlation coefficient for the normal plot
Lognormal r2 - Correlation coefficient for the lognormal plot
95/95 BUTL - 95 percent/95 percent background upper tolerance limit
na - Not applicable.
nc - Not calculated.

[a] The Shapiro-Wilks test is only applicable to data sets of < 50 samples.

[b] D'Agostino's Test is only applicable to data sets of ≥ 50 samples.

[c] A 95/95 BUTL could not be calculated for this analyte due to insufficient data.

Table 3-6
Summary Statistics and Derived BUTLs for Shallow Subsurface Water
Northeast Cape, St. Lawrence Island, Alaska

	All data				Outliers Removed								
										Z-score Plots			
	Number of results	Number of detects	Max detect	Min result	Stdev	Mean	CV	Shapiro-Wilks Test[a]	D'Agostino's Test[b]	Normal r^2	Lognormal r^2	Assumed Distribution	95/95 BUTL
Inorganics, Total (mg/L)													
Aluminum	8	8	164	0.82	nc	nc	nc	na	na	nc	nc	nc	nc[c]
Antimony	29	1	0.12	<0.05	nc	nc	nc	na	na	nc	nc	nc	nc[c]
Arsenic	21	18	0.11	0.003	0.0035	0.0059	0.59	Inconclusive	na	0.93	0.97	Lognormal	0.025
Barium	8	8	1.2	0.02	nc	nc	nc	na	na	nc	nc	nc	nc[c]
Beryllium	29	8	0.040	<0.001	0.0054	0.0091	0.59	Inconclusive	na	0.99	0.82	Normal	0.021
Cadmium	29	4	0.060	0.0020	0.010	0.0096	1.1	Inconclusive	na	0.61	0.96	Lognormal	0.060
Chromium	29	22	1.2	<0.005	0.24	0.150	1.6	Inconclusive	na	0.59	0.98	Lognormal	1.7
Cobalt	8	7	0.064	<0.003	0.0015	0.0036	0.41	Inconclusive	na	0.92	0.83	Normal	0.011
Copper	29	25	0.50	0.0020	0.023	0.032	0.71	Inconclusive	na	0.93	0.91	Normal	0.087
Lead	31	31	0.68	0.0020	0.0022	0.0053	0.41	Inconclusive	na	0.96	0.89	Normal	0.013
Manganese	10	10	2.2	0.056	0.024	0.078	0.30	Inconclusive	na	0.91	0.91	Normal	0.20
Mercury	21	7	0.00060	0.00010	0.000078	0.00022	0.36	Inconclusive	na	0.93	0.78	Normal	0.00041
Nickel	29	17	3.5	<0.01	0.012	0.024	0.52	Inconclusive	na	1.0	0.87	Normal	0.056
Selenium	21	0	ND	<0.002	nc	nc	nc	na	na	nc	nc	nc	nc[c]
Silver	29	0	ND	<0.003	nc	nc	nc	na	na	nc	nc	nc	nc[c]
Thallium	29	1	0.0020	<0.001	nc	nc	nc	na	na	nc	nc	nc	nc[c]
Vanadium	8	7	0.15	<0.003	0.015	0.021	0.68	Inconclusive	na	0.94	0.76	Normal	0.097
Zinc	29	24	18	<0.006	0.077	0.088	0.87	Inconclusive	na	0.88	0.88	Normal	0.29
Inorganics, Dissolved (mg/L)													
Antimony, Dissolved	21	0	ND	<0.1	nc	nc	nc	na	na	nc	nc	nc	nc[c]
Arsenic, Dissolved	13	3	0.011	<0.005	0.0030	0.0040	0.76	Inconclusive	na	0.97	0.98	Lognormal	0.015
Beryllium, Dissolved	21	0	ND	<0.02	nc	nc	nc	na	na	nc	nc	nc	nc[c]
Cadmium, Dissolved	21	0	ND	<0.02	nc	nc	nc	na	na	nc	nc	nc	nc[c]
Chromium, Dissolved	21	0	ND	<0.02	nc	nc	nc	na	na	nc	nc	nc	nc[c]
Copper, Dissolved	21	0	ND	<0.02	nc	nc	nc	na	na	nc	nc	nc	nc[c]
Lead, Dissolvedc	21	5	0.015	0.0020	nc	nc	nc	na	na	nc	nc	nc	nc[c]

Table 3-6
Summary Statistics and Derived BUTLs for Shallow Subsurface Water
Northeast Cape, St. Lawrence Island, Alaska

	All data				Outliers Removed								
										Z-score Plots			
	Number of results	Number of detects	Max detect	Min result	Stdev	Mean	CV	Shapiro-Wilks Test[a]	D'Agostino's Test[b]	Normal r^2	Lognormal r^2	Assumed Distribution	95/95 BUTL
Mercury, Dissolved	13	0	ND	<0.0005	nc	nc	nc	na	na	nc	nc	nc	nc[c]
Nickel, Dissolved	21	0	ND	<0.05	nc	nc	nc	na	na	nc	nc	nc	nc[c]
Selenium, Dissolved	13	0	ND	<0.005	nc	nc	nc	na	na	nc	nc	nc	nc[c]
Silver, Dissolved	21	0	ND	<0.02	nc	nc	nc	na	na	nc	nc	nc	nc[c]
Thallium, Dissolved	21	0	ND	<0.001	nc	nc	nc	na	na	nc	nc	nc	nc[c]
Zinc, Dissolved	21	0	ND	<0.05	nc	nc	nc	na	na	nc	nc	nc	nc[c]

Notes:
ND - Non-detect result
Stdev - Standard deviation
Normal r2 - Correlation coefficient for the normal plot
Lognormal r2 - Correlation coefficient for the lognormal plot
95/95 BUTL - 95 percent/95 percent background upper tolerance limit
na - Not applicable.
NC - Not calculated.

[a] The Shapiro-Wilks test is only applicable to data sets of < 50 samples.

[b] D'Agostino's Test is only applicable to data sets of ≥ 50 samples.

[c] A 95/95 BUTL could not be calculated for this analyte due to insufficient data.

Table 3-7
Summary Statistics and Derived BUTLs for Deep Subsurface Water
Northeast Cape, St. Lawrence Island, Alaska

	All data				Outliers Removed								
										Z-score Plots			
	Number of results	Number of detects	Max detect	Min result	Stdev	Mean	CV	Shapiro-Wilks Test[a]	D'Agostino's Test[b]	Normal r^2	Lognormal r^2	Assumed Distribution	95/95 BUTL
Inorganics, Total (mg/L)													
Manganese	4	4	0.20	0.12	nc	nc	nc	na	na	nc	nc	nc	nc[c]
Inorganics, Dissolved (mg/L)													
Manganese, dissolved	4	4	0.17	0.089	nc	nc	nc	na	na	nc	nc	nc	nc[c]

Notes:
ND - Non-detect result
Stdev - Standard deviation
Normal r^2 - Correlation coefficient for the normal plot
Lognormal r^2 - Correlation coefficient for the lognormal plot
95/95 BUTL - 95 percent/95 percent background upper tolerance limit
na - Not applicable.
nc - Not calculated.

[a] The Shapiro-Wilks test is only applicable to data sets of < 50 samples.

[b] D'Agostino's Test is only applicable to data sets of ≥ 50 samples.

[c] A 95/95 BUTL could not be calculated for this analyte due to insufficient data.

Section 4

MWH

4.0 SUMMARY AND CONCLUSIONS

Ambient levels were developed for the Northeast Cape Site in support of human health and ecological risk assessments conducted under the Phase III Remedial Investigation for Northeast Cape. Derived ambient levels were evaluated against regional ambient concentrations, where available, including ambient concentrations for soils and sediments described in *Element Concentrations in Soil and Other Surficial Materials of Alaska* (USGS, 1988), for comparison. Ambient levels proposed for Northeast Cape are summarized in Tables 4-1 through 4-4.

For tundra soils, sufficient data were available to derive ambient levels for aluminum, arsenic, barium, beryllium, cadmium, chromium, cobalt, copper, lead, manganese, mercury, nickel, thallium, vanadium and zinc (Table 4-1). In all cases except cadmium and thallium, derived ambient levels were within the range of typical concentrations reported for Alaska soils. Published ambient levels for Alaska soils are not available for cadmium or thallium. The upper end of the range of ambient levels for cadmium in mid-western U.S. soils is approximately one-half the ambient concentration calculated for the Northeast Cape. Insufficient data were available to derive ambient levels for antimony, selenium and silver in tundra soils at Northeast Cape. For gravel soils, sufficient data were available to derive ambient levels for arsenic, cadmium, chromium, copper, lead, nickel, thallium and zinc (Table 4-1). Again, derived ambient levels for gravel soils at Northeast Cape were within the range of typical concentrations reported for soils in Alaska, except cadmium and thallium. Insufficient data were available to derive ambient levels for aluminum, antimony, barium, beryllium, cobalt, selenium and silver in gravel soils at Northeast Cape.

For freshwater sediment, sufficient data were available to derive ambient levels for beryllium, chromium, copper, lead, nickel and zinc (Table 4-2). In all cases, derived ambient levels were within the range of typical concentrations reported for Alaskan lake and stream sediments. Insufficient data were available to derive ambient levels for aluminum, antimony, arsenic, barium, cadmium, cobalt, manganese, mercury, selenium silver, thallium and vanadium in freshwater sediments of Northeast Cape.

Insufficient data were available to calculate ambient levels for any inorganic chemicals in permanent fresh surface water (Table 4-3). Sufficient data were only available to derive ambient levels for aluminum, barium, copper, lead, manganese, zinc, and dissolved zinc. Inorganic concentrations of other chemicals in surface water tended to be non-detect or were detected with frequencies too low to calculate meaningful 95/95 BUTLs.

For shallow subsurface water, sufficient data were available to derive ambient levels for total arsenic, beryllium, cadmium, chromium, cobalt, copper, lead, manganese, mercury, nickel, vanadium, zinc; and dissolved arsenic (Table 4-4). Ambient or 'typical' levels of inorganic chemicals in subsurface waters of Alaska are not currently available. However, derived ambient levels were lower than, or within the range of, ADEC Table C Groundwater Cleanup Levels (18 AAC 75.345) (Table 4-3). Insufficient data were available to derive ambient levels for aluminum, antimony, barium, selenium, silver and thallium in shallow subsurface water at

Northeast Cape. The only inorganic chemical detected in deep subsurface water was manganese, and insufficient data were available to calculate ambient levels for this chemical (Table 4-4).

Based on this assessment, the derived ambient levels for tundra soils, gravel soils, freshwater sediments, and shallow subsurface water described herein are proposed for use as contaminant screening criteria in the revised human health and ecological risk assessments for Northeast Cape.

Table 4-1
Proposed Ambient Levels for Soil
Northeast Cape, St. Lawrence Island, Alaska

Chemical	NEC Soil BUTL		Ambient Soil Concentration	
	Tundra Soil	Gravel Soil	Mean	Range
Inorganic (mg/kg)				
Aluminum	30,357	nc	65,000 [a]	12,000 - 100,000 [a]
Antimony	nc	nc	na	na
Arsenic	7.8	11	9.6 [a]	<10 - 750 [a]
Barium	174	nc	678 [a]	39 - 3,100 [a]
Beryllium	3.8	nc	1.35 [a]	<1 - 7 [a]
Cadmium	1.4	3.1	0.5 [c]	0.01 - 0.70 [c]
Chromium	48	50	64 [a]	5 - 390 [a]
Cobalt	49	nc	14 [a]	<2 - 55 [a]
Copper	107	44	29 [a]	3 - 810 [a]
Lead	106	112	14 [a]	<4 - 310 [a]
Manganese	1,589	nc	670 [a]	200 - 4,000 [a]
Mercury	0.43	nc	0.046 [b]	<0.01 - 4.6 [b]
Nickel	59	30	33 [a]	<3 - 320 [a]
Selenium	nc	nc	na	na
Silver	nc	nc	na	na
Thallium	1.6	0.56	na	na
Vanadium	73	nc	129 [a]	11 - 490 [a]
Zinc	615	157	79 [a]	<20 - 2,700 [a]

Notes:
mg/kg = Milligrams per kilogram.
na - Not applicable.
nc - Not calculated.

[a] Source: Gough, L.P., R.C. Severson and H.T. Shacklette, 1984. *Element Concentrations in Soil and Other Surficial Materials of Alaska* , United States Geological Survey, Professional Paper 1458.

[b] Source: Shacklette, H.T. and J.G. Boerngen, 1984. *Element Concentrations in Soil and Other Surficial Materials of the Conterminous United States* , United States Geological Survey, Professional Paper 1270.

[c] Source: Baker, D.E. and L. Chesnin, 1975. Chemical monitoring of soils for environmental quality and animal and human health. *Advan. Agron* ., 27:306-374.

Table 4-2
Proposed Ambient Levels for Sediment
Northeast Cape, St. Lawrence Island, Alaska

Chemical	NEC Freshwater Sediment BUTL	Ambient Sediment Concentration [a]	
		Mean	Range
Inorganic (mg/kg)			
Aluminum	nc	na	na
Antimony	nc	na	na
Arsenic	nc	na	na
Barium	nc	na	na
Beryllium	9.8	2.0	1.0 - 12
Cadmium	nc	na	na
Chromium	34	115	1 - 15,000
Cobalt	nc	na	na
Copper	40	37	7 - 14,000
Lead	78	12	4 - 10,000
Manganese	nc	na	na
Mercury	nc	na	na
Nickel	126	37	9 - 1,800
Selenium	nc	na	na
Silver	nc	na	na
Thallium	nc	na	na
Vanadium	nc	na	na
Zinc	148	157	14 - 4,700

Notes:
mg/kg = Milligrams per kilogram.
na - Not applicable.
nc - Not calculated.
[a] Source: Gough, L.P., R.C. Severson and H.T. Shacklette, 1984. Element Concentrations in Soil and Other Surficial Materials of Alaska, United States Geological Survey, Professional Paper 1458.

Table 4-3
Proposed Ambient Levels for Surface Water
Northeast Cape, St. Lawrence Island, Alaska

Chemical	NEC Fresh Surface Water BUTL	NEC Ephemeral Surface Water BUTL	USEPA Freshwater Ambient Water Quality Criterion[a]
Inorganics, Total (mg/L)			
Aluminum	nc	2.2	0.087
Antimony	nc	nc	na
Arsenic	nc	nc	na
Barium	nc	0.034	na
Beryllium	nc	nc	na
Cadmium	nc	nc	na
Chromium	nc	nc	na
Cobalt	nc	nc	na
Copper	nc	0.083	0.009
Lead	nc	0.014	0.0025
Manganese	nc	0.12	1.0 [b]
Mercury	nc	nc	na
Nickel	nc	nc	na
Selenium	nc	nc	na
Silver	nc	nc	na
Thallium	nc	nc	na
Vanadium	nc	nc	na
Zinc	nc	0.90	0.11
Inorganics, Dissolved (mg/L)			
Antimony, Dissolved	nc	nc	na
Arsenic, Dissolved	nc	nc	na
Beryllium, Dissolved	nc	nc	na
Cadmium, Dissolved	nc	nc	na
Chromium, Dissolved	nc	nc	na
Copper, Dissolved	nc	nc	na
Lead, Dissolved	nc	nc	na
Mercury, Dissolved	nc	nc	na
Nickel, Dissolved	nc	nc	na
Selenium, Dissolved	nc	nc	na
Silver, Dissolved	nc	nc	na
Thallium, Dissolved	nc	nc	na
Zinc, Dissolved	nc	0.093	0.11

Notes:

mg/L = Milligrams per liter.

[a] Source: USEPA Ambient Water Quality Criteria - Freshwater Chronic Value. *Screening Quick Reference Tables (SQuiRTs)* . National Oceanic and Atmospheric Administration (NOAA), 2000.

Table 4-4
Proposed Ambient Levels for Subsurface Water
Northeast Cape, St. Lawrence Island, Alaska

Chemical	NEC Shallow Subsurface Water BUTL	NEC Deep Subsurface Water BUTL	ADEC Table C Concentration [a]
Inorganics, Total (mg/L)			
Aluminum	nc	nc	na
Antimony	nc	nc	na
Arsenic	0.025	nc	0.05
Barium	nc	nc	na
Beryllium	0.021	nc	0.004
Cadmium	0.060	nc	0.005
Chromium	1.7	nc	36.5
Cobalt	0.011	nc	na
Copper	0.087	nc	1.3
Lead	0.013	nc	0.015
Manganese	0.20	nc	na
Mercury	0.00041	nc	0.002
Nickel	0.056	nc	0.1
Selenium	nc	nc	na
Silver	nc	nc	na
Thallium	nc	nc	na
Vanadium	0.097	nc	0.26
Zinc	0.29	nc	11
Inorganics, Dissolved (mg/L)			
Antimony, Dissolved	nc	nc	na
Arsenic, Dissolved	0.015	nc	0.05
Beryllium, Dissolved	nc	nc	na
Cadmium, Dissolved	nc	nc	na
Chromium, Dissolved	nc	nc	na
Copper, Dissolved	nc	nc	na
Lead, Dissolved	nc	nc	na
Mercury, Dissolved	nc	nc	na
Nickel, Dissolved	nc	nc	na
Selenium, Dissolved	nc	nc	na
Silver, Dissolved	nc	nc	na
Thallium, Dissolved	nc	nc	na
Zinc, Dissolved	nc	nc	na

Notes:
mg/L = Milligrams per liter.
[a] Source: ADEC Table C Groundwater Cleanup Levels (18 AAC 75.345).

Section 5

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5.0 REFERENCES

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Appendix A

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Attachment A - Statistical Analysis Tables

Table A-1.1
Statistical Analysis for Aluminum in Soil Tundra
Northeast Cape, St. Lawrence Island, Alaska

$[Al]_i$	i	ties	quantile	z-score	$ln[Al]_i$	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
########	1		0.025	-1.964	-12.53	1.22	2.82	no	1.2629	5.48E+00
4.5	2		0.064	-1.519	1.50					
5	3.5		0.124	-1.156	1.61					
5	3.5	!	0.124	-1.156	1.61					
10	5		0.183	-0.903	2.30					
640	6		0.223	-0.763	6.46					
3640	7		0.262	-0.636	8.20					
3975	8		0.302	-0.519	8.29					
5570	9		0.342	-0.408	8.63					
7110	10		0.381	-0.302	8.87					
9850	11		0.421	-0.200	9.20					
10800	12		0.460	-0.099	9.29					
11300	13		0.500	0.000	9.33					
11700	14		0.540	0.099	9.37					
12000	15		0.579	0.200	9.39					
13200	16		0.619	0.302	9.49					
13400	17		0.658	0.408	9.50					
14700	18		0.698	0.519	9.60					
14800	19		0.738	0.636	9.60					
17300	20		0.777	0.763	9.76					
18100	21		0.817	0.903	9.80					
18750	22		0.856	1.064	9.84					
19400	23		0.896	1.259	9.87					
24600	24		0.936	1.519	10.11					
33100	25		0.975	1.964	10.41	2.61	2.82	no	3.1065	1.24E-01

n	25	
max	33100	
min	########	
stdev	8638	5.03
mean	10558	7.2
CV	0.82	
Normal r^2	0.93	
Lognormal r^2	0.58	
$k_{0.95;0.95,n}$	2.3	2.3
Normal BUTL	30357	
Lognormal BUTL		########

Table A-1.2
Statistical Analysis for Arsenic in Soil Tundra
Northeast Cape, St. Lawrence Island, Alaska

$[As]_i$	i	ties	quantile	z-score	$ln[As]_i$	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
0.05	1		0.010	-2.342	-3.00	3.14	3.20	no	3.4151	7.28E-02
0.25	2		0.025	-1.962	-1.39					
0.3	3		0.040	-1.748	-1.20					
0.35	4		0.056	-1.593	-1.05					
0.475	5		0.071	-1.469	-0.74					
0.5	7		0.102	-1.273	-0.69					
0.5	7	!	0.102	-1.273	-0.69					
0.5	7	!	0.102	-1.273	-0.69					
0.65	9		0.132	-1.116	-0.43					
0.7	10		0.148	-1.047	-0.36					
1	12		0.178	-0.922	0.00					
1	12	!	0.178	-0.922	0.00					
1	12	!	0.178	-0.922	0.00					
1.5	14		0.209	-0.811	0.41					
2	15.5		0.232	-0.733	0.69					
2	15.5	!	0.232	-0.733	0.69					
2.5	17		0.255	-0.659	0.92					
2.7	18.5		0.278	-0.589	0.99					
2.7	18.5	!	0.278	-0.589	0.99					
2.8	20		0.301	-0.522	1.03					
3	21		0.316	-0.479	1.10					
3.2	22		0.331	-0.436	1.16					
3.3	23		0.347	-0.394	1.19					
3.35	24		0.362	-0.353	1.21					
3.5	25		0.377	-0.312	1.25					
3.6	26.5		0.400	-0.252	1.28					
3.6	26.5	!	0.400	-0.252	1.28					
3.7	28		0.423	-0.193	1.31					
3.9	29.5		0.446	-0.135	1.36					
3.9	29.5	!	0.446	-0.135	1.36					
4	31.5		0.477	-0.058	1.39					
4	31.5	!	0.477	-0.058	1.39					
4.1	33.5		0.508	0.019	1.41					
4.1	33.5	!	0.508	0.019	1.41					
4.3	35.5		0.538	0.096	1.46					
4.3	35.5	!	0.538	0.096	1.46					
4.45	37		0.561	0.154	1.49					
4.5	38		0.577	0.193	1.50					
5.15	39		0.592	0.233	1.64					
5.6	40		0.607	0.272	1.72					
5.8	41		0.623	0.312	1.76					
5.9	42.5		0.646	0.373	1.77					
5.9	42.5	!	0.646	0.373	1.77					
6.1	44		0.669	0.436	1.81					
6.3	45.5		0.692	0.500	1.84					
6.3	45.5	!	0.692	0.500	1.84					
6.4	47		0.715	0.567	1.86					
7.2	48		0.730	0.612	1.97					
7.3	49		0.745	0.659	1.99					
7.9	50		0.761	0.708	2.07					
10	51		0.776	0.758	2.30					
11	52		0.791	0.811	2.40					
11.5	53		0.807	0.865	2.44					
12.1	54		0.822	0.922	2.49					

Table A-1.2
Statistical Analysis for Arsenic in Soil Tundra
Northeast Cape, St. Lawrence Island, Alaska

$[As]_i$	i	ties	quantile	z-score	$ln[As]_i$	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
12.5	55		0.837	0.983	2.53					
13.5	56		0.852	1.047	2.60					
13.8	57		0.868	1.116	2.62					
14.7	58		0.883	1.191	2.69					
17.3	59		0.898	1.273	2.85					
20	60		0.914	1.364	3.00					
21	61		0.929	1.469	3.04					
30	62		0.944	1.593	3.40					
39	63		0.960	1.748	3.66					
50	64		0.975	1.962	3.91					
170	65		0.990	2.342	5.14	2.76	3.20	no	2.9394	2.98E-01

n	65	
max	170	
min	0.050	
stdev	22	1.38
mean	9.5	1.3
CV	2.34	
Normal r^2	0.33	
Lognormal r^2	0.96	
$k_{0.95;0.95,n}$	2.0	2.0
Normal BUTL	54	
Lognormal BUTL		60

Analysis of Data After Data Elimination Based on Visual Inspection

$[As]_i$	i	ties	quantile	z-score	$ln[As]_i$	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
0.05	1		0.012	-2.243	-3.00	1.52	3.13	no	1.5627	6.24E+00
0.25	2		0.032	-1.847	-1.39					
0.3	3		0.052	-1.624	-1.20					
0.35	4		0.072	-1.460	-1.05					
0.475	5		0.092	-1.328	-0.74					
0.5	7		0.132	-1.118	-0.69					
0.5	7	!	0.132	-1.118	-0.69					
0.5	7	!	0.132	-1.118	-0.69					
0.65	9		0.172	-0.948	-0.43					
0.7	10		0.192	-0.872	-0.36					
1	12		0.231	-0.734	0.00					
1	12	!	0.231	-0.734	0.00					
1	12	!	0.231	-0.734	0.00					
1.5	14		0.271	-0.609	0.41					
2	15.5		0.301	-0.522	0.69					
2	15.5	!	0.301	-0.522	0.69					
2.5	17		0.331	-0.438	0.92					
2.7	18.5		0.361	-0.357	0.99					
2.7	18.5	!	0.361	-0.357	0.99					
2.8	20		0.391	-0.278	1.03					
3	21		0.410	-0.226	1.10					
3.2	22		0.430	-0.175	1.16					

Table A-1.2
Statistical Analysis for Arsenic in Soil Tundra
Northeast Cape, St. Lawrence Island, Alaska

	$[As]_i$	i	ties	quantile	z-score	$ln[As]_i$	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
	3.3	23		0.450	-0.125	1.19					
	3.35	24		0.470	-0.075	1.21					
	3.5	25		0.490	-0.025	1.25					
	3.6	26.5		0.520	0.050	1.28					
	3.6	26.5	!	0.520	0.050	1.28					
	3.7	28		0.550	0.125	1.31					
	3.9	29.5		0.580	0.201	1.36					
	3.9	29.5	!	0.580	0.201	1.36					
	4	31.5		0.619	0.304	1.39					
	4	31.5	!	0.619	0.304	1.39					
	4.1	33.5		0.659	0.410	1.41					
	4.1	33.5	!	0.659	0.410	1.41					
	4.3	35.5		0.699	0.522	1.46					
	4.3	35.5	!	0.699	0.522	1.46					
	4.45	37		0.729	0.609	1.49					
	4.5	38		0.749	0.671	1.50					
	5.15	39		0.769	0.734	1.64					
	5.6	40		0.789	0.801	1.72					
	5.8	41		0.808	0.872	1.76					
	5.9	42.5		0.838	0.988	1.77					
	5.9	42.5	!	0.838	0.988	1.77					
	6.1	44		0.868	1.118	1.81					
	6.3	45.5		0.898	1.270	1.84					
	6.3	45.5	!	0.898	1.270	1.84					
	6.4	47		0.928	1.460	1.86					
	7.2	48		0.948	1.624	1.97					
	7.3	49		0.968	1.847	1.99					
	7.9	50		0.988	2.243	2.07	2.09	3.13	no	2.1899	1.67E+00
n	50										
max	7.9										
min	0.050										
stdev	2.2					1.1					
mean	3.4					0.83					
CV	0.65										
Normal r^2	0.96										
Lognormal r^2	0.84										
$k_{0.95;0.95,n}$	2.1					2.1					
Normal BUTL	7.8										
Lognormal BUTL						22					

Note:
Visual inspection of the data resulted in an elimination of values greater than 7.9 mg/kg.

Table A-1.3
Statistical Analysis for Barium in Soil Tundra
Northeast Cape, St. Lawrence Island, Alaska

$[Ba]_i$	i	ties	quantile	z-score	$ln[Ba]_i$	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
0.5	1		0.022	-2.012	-0.69	1.30	2.88	no	1.3398	5.37E+00
0.83	2		0.058	-1.576	-0.19					
1	4		0.128	-1.134	0.00					
1	4	!	0.128	-1.134	0.00					
1	4	!	0.128	-1.134	0.00					
1.5	6		0.199	-0.845	0.41					
28	7		0.235	-0.724	3.33					
30.4	8		0.270	-0.613	3.41					
34	9		0.305	-0.509	3.53					
46	10		0.341	-0.411	3.83					
49	11		0.376	-0.316	3.89					
53.8	12		0.412	-0.224	3.99					
56.5	13		0.447	-0.133	4.03					
63	14		0.482	-0.044	4.14					
77.4	15		0.518	0.044	4.35					
78	16		0.553	0.133	4.36					
96	17		0.588	0.224	4.56					
97.2	18		0.624	0.316	4.58					
103	19		0.659	0.411	4.63					
115	20		0.695	0.509	4.74					
122	21.5		0.748	0.668	4.80					
122	21.5	!	0.748	0.668	4.80					
135	23		0.801	0.845	4.91					
136	24		0.836	0.979	4.91					
143	25		0.872	1.134	4.96					
155	26		0.907	1.323	5.04					
166.5	27		0.942	1.576	5.11					
193	28		0.978	2.012	5.26	2.04	2.88	no	2.2304	9.68E-01

n	28	
max	193	
min	0.50	
stdev	58	2.0
mean	75	3.5
CV	0.77	
Normal r^2	0.96	
Lognormal r^2	0.76	
$k_{0.95;0.95,n}$	2.2	2.2
Normal BUTL	205	
Lognormal BUTL		2535

Analysis of Windsorized Data

$[Ba]_i$	i	ties	quantile	z-score	$ln[Ba]_i$	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
1	1		0.031	-1.868	0.00	1.68	2.71	no	1.8277	1.68E+00
1.5	2		0.080	-1.403	0.41					
28	3		0.130	-1.128	3.33					
30.4	4		0.179	-0.919	3.41					
34	5		0.228	-0.744	3.53					

Table A-1.3
Statistical Analysis for Barium in Soil Tundra
Northeast Cape, St. Lawrence Island, Alaska

$[Ba]_i$	i	ties	quantile	z-score	$ln[Ba]_i$	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
46	6		0.278	-0.589	3.83					
49	7		0.327	-0.448	3.89					
53.8	8		0.377	-0.315	3.99					
56.5	9		0.426	-0.187	4.03					
63	10		0.475	-0.062	4.14					
77.4	11		0.525	0.062	4.35					
78	12		0.574	0.187	4.36					
96	13		0.623	0.315	4.56					
97.2	14		0.673	0.448	4.58					
103	15		0.722	0.589	4.63					
115	16		0.772	0.744	4.74					
122	17.5		0.846	1.018	4.80					
122	17.5	!	0.846	1.018	4.80					
135	19		0.920	1.403	4.91					
136	20		0.969	1.868	4.91	1.50	2.71	no	1.6064	2.51E+00

n	20		
max	136		
min	1.0		
stdev	42	1.3	
mean	72	3.9	
CV	0.59		
Normal r^2	0.97		
Lognormal r^2	0.69		
$k_{0.95;0.95,n}$	2.4	2.4	
Normal BUTL	174		
Lognormal BUTL		1194	

Note:
Visual inspection of the data resulted in windorizing the data for elimination of the 4 lowest and 4 highest values.

Table A-1.4
Statistical Analysis for Beryllium in Soil Tundra
Northeast Cape, St. Lawrence Island, Alaska

$[Be]_i$	i	ties	quantile	z-score	$ln[Be]_i$	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
0.25	1		0.008	-2.409	-1.39	2.20	3.26	no	2.2741	2.01E+00
0.26	2		0.021	-2.038	-1.35					
0.3	3		0.034	-1.831	-1.20					
0.35	4		0.046	-1.682	-1.05					
0.4	5.5		0.065	-1.510	-0.92					
0.4	5.5	!	0.065	-1.510	-0.92					
0.45	7		0.085	-1.374	-0.80					
0.5	8		0.097	-1.296	-0.69					
0.6	9		0.110	-1.225	-0.51					
0.65	10		0.123	-1.160	-0.43					
0.7	12.5		0.155	-1.015	-0.36					
0.7	12.5	!	0.155	-1.015	-0.36					
0.7	12.5	!	0.155	-1.015	-0.36					
0.7	12.5	!	0.155	-1.015	-0.36					
0.8	16		0.200	-0.843	-0.22					
0.8	16	!	0.200	-0.843	-0.22					
0.8	16	!	0.200	-0.843	-0.22					
0.9	18.5		0.232	-0.733	-0.11					
0.9	18.5	!	0.232	-0.733	-0.11					
1	37.5		0.474	-0.064	0.00					
1	37.5	!

Table A-1.4
Statistical Analysis for Beryllium in Soil Tundra
Northeast Cape, St. Lawrence Island, Alaska

$[Be]_i$	i	ties	quantile	z-score	$ln[Be]_i$	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
1	37.5	!	0.474	-0.064	0.00					
1	37.5	!	0.474	-0.064	0.00					
1.1	56.5		0.717	0.575	0.10					
1.1	56.5	!	0.717	0.575	0.10					
1.2	58.5		0.743	0.652	0.18					
1.2	58.5	!	0.743	0.652	0.18					
1.4	60		0.762	0.713	0.34					
1.6	61.5		0.781	0.776	0.47					
1.6	61.5	!	0.781	0.776	0.47					
1.7	63.5		0.807	0.866	0.53					
1.7	63.5	!	0.807	0.866	0.53					
1.8	65.5		0.832	0.963	0.59					
1.8	65.5	!	0.832	0.963	0.59					
2	67		0.851	1.043	0.69					
2.1	68		0.864	1.099	0.74					
2.3	69		0.877	1.160	0.83					
2.95	70		0.890	1.225	1.08					
3.2	71		0.903	1.296	1.16					
3.3	72		0.915	1.374	1.19					
3.55	73		0.928	1.462	1.27					
4.05	74		0.941	1.562	1.40					
4.45	75		0.954	1.682	1.49					
6.5	76		0.966	1.831	1.87					
7.5	77		0.979	2.038	2.01					
10.25	78		0.992	2.409	2.33	3.26	3.26	yes	3.5154	5.80E-02

n	78	
max	10.25	
min	0.25	
stdev	1.6	0.68
mean	1.5	0.11
CV	1.1	
Normal r^2	0.57	
Lognormal r^2	0.92	
$k_{0.95;0.95,n}$	2.0	2.0
Normal BUTL	4.6	
Lognormal BUTL		4.3

Analysis with outliers removed (1)

$[Be]_i$	i	ties	quantile	z-score	$ln[Be]_i$	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
0.25	1		0.008	-2.405	-1.39	2.31	3.26	no	2.3988	1.46E+00
0.26	2		0.021	-2.033	-1.35					
0.3	3		0.034	-1.825	-1.20					
0.35	4		0.047	-1.675	-1.05					
0.4	5.5		0.066	-1.504	-0.92					
0.4	5.5	!	0.066	-1.504	-0.92					
0.45	7		0.086	-1.367	-0.80					
0.5	8		0.099	-1.289	-0.69					

Table A-1.4
Statistical Analysis for Beryllium in Soil Tundra
Northeast Cape, St. Lawrence Island, Alaska

$[Be]_i$	i	ties	quantile	z-score	$ln[Be]_i$	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
0.6	9		0.112	-1.218	-0.51					
0.65	10		0.125	-1.152	-0.43					
0.7	12.5		0.157	-1.007	-0.36					
0.7	12.5	!	0.157	-1.007	-0.36					
0.7	12.5	!	0.157	-1.007	-0.36					
0.7	12.5	!	0.157	-1.007	-0.36					
0.8	16		0.202	-0.834	-0.22					
0.8	16	!	0.202	-0.834	-0.22					
0.8	16	!	0.202	-0.834	-0.22					
0.9	18.5		0.235	-0.724	-0.11					
0.9	18.5	!	0.235	-0.724	-0.11					
1	37.5		0.481	-0.049	0.00					
1	37.5	!	0.481	-0.049	0.00					
1	37.5	!	0.481	-0.049	0.00					
1	37.5	!	0.481	-0.049	0.00					
1	37.5	!	0.481	-0.049	0.00					
1	37.5	!	0.481	-0.049	0.00					
1	37.5	!	0.481	-0.049	0.00					
1	37.5	!	0.481	-0.049	0.00					
1	37.5	!	0.481	-0.049	0.00					
1	37.5	!	0.481	-0.049	0.00					
1	37.5	!	0.481	-0.049	0.00					
1	37.5	!	0.481	-0.049	0.00					
1	37.5	!	0.481	-0.049	0.00					
1	37.5	!	0.481	-0.049	0.00					
1	37.5	!	0.481	-0.049	0.00					
1	37.5	!	0.481	-0.049	0.00					
1	37.5	!	0.481	-0.049	0.00					
1	37.5	!	0.481	-0.049	0.00					
1	37.5	!	0.481	-0.049	0.00					
1	37.5	!	0.481	-0.049	0.00					
1	37.5	!	0.481	-0.049	0.00					
1	37.5	!	0.481	-0.049	0.00					
1	37.5	!	0.481	-0.049	0.00					
1	37.5	!	0.481	-0.049	0.00					
1	37.5	!	0.481	-0.049	0.00					
1	37.5	!	0.481	-0.049	0.00					
1	37.5	!	0.481	-0.049	0.00					
1	37.5	!	0.481	-0.049	0.00					
1	37.5	!	0.481	-0.049	0.00					
1	37.5	!	0.481	-0.049	0.00					
1	37.5	!	0.481	-0.049	0.00					
1	37.5	!	0.481	-0.049	0.00					
1	37.5	!	0.481	-0.049	0.00					
1	37.5	!	0.481	-0.049	0.00					
1	37.5	!	0.481	-0.049	0.00					
1	37.5	!	0.481	-0.049	0.00					
1	37.5	!	0.481	-0.049	0.00					
1	37.5	!	0.481	-0.049	0.00					
1	37.5	!	0.481	-0.049	0.00					
1	37.5	!	0.481	-0.049	0.00					
1	37.5	!	0.481	-0.049	0.00					
1	37.5	!	0.481	-0.049	0.00					
1	37.5	!	0.481	-0.049	0.00					
1	37.5	!	0.481	-0.049	0.00					
1	37.5	!	0.481	-0.049	0.00					
1	37.5	!	0.481	-0.049	0.00					
1	37.5	!	0.481	-0.049	0.00					
1	37.5	!	0.481	-0.049	0.00					
1	37.5	!	0.481	-0.049	0.00					
1	37.5	!	0.481	-0.049	0.00					
1	37.5	!	0.481	-0.049	0.00					
1	37.5	!	0.481	-0.049	0.00					
1	37.5	!	0.481	-0.049	0.00					
1.1	56.5		0.727	0.602	0.10					
1.1	56.5	!	0.727	0.602	0.10					
1.2	58.5		0.752	0.682	0.18					
1.2	58.5	!	0.752	0.682	0.18					
1.4	60		0.772	0.745	0.34					
1.6	61.5		0.791	0.811	0.47					

Table A-1.4
Statistical Analysis for Beryllium in Soil Tundra
Northeast Cape, St. Lawrence Island, Alaska

$[Be]_i$	i	ties	quantile	z-score	$ln[Be]_i$	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
1.6	61.5	!	0.791	0.811	0.47					
1.7	63.5		0.817	0.905	0.53					
1.7	63.5	!	0.817	0.905	0.53					
1.8	65.5		0.843	1.007	0.59					
1.8	65.5	!	0.843	1.007	0.59					
2	67		0.862	1.091	0.69					
2.1	68		0.875	1.152	0.74					
2.3	69		0.888	1.218	0.83					
2.95	70		0.901	1.289	1.08					
3.2	71		0.914	1.367	1.16					
3.3	72		0.927	1.455	1.19					
3.55	73		0.940	1.556	1.27					
4.05	74		0.953	1.675	1.40					
4.45	75		0.966	1.825	1.49					
6.5	76		0.979	2.033	1.87					
7.5	77		0.992	2.405	2.01	3.05	3.26	no	3.2537	1.32E-01

n	77	
max	7.5	
min	0.25	
stdev	1.2	0.63
mean	1.4	0.081
CV	0.90	
Normal r^2	0.63	
Lognormal r^2	0.93	
$k_{0.95;0.95,n}$	2.0	2.0
Normal BUTL	3.8	
Lognormal BUTL		3.8

Table A-1.5
Statistical Analysis for Cadmium in Soil Tundra
Northeast Cape, St. Lawrence Island, Alaska

$[Cd]_i$	i	ties	quantile	z-score	$ln[Cd]_i$	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
0.0025	1		0.008	-2.414	-5.99	5.23	3.26	yes	6.5042	5.61E-07
0.1	2		0.021	-2.043	-2.30					
0.15	3.5		0.039	-1.757	-1.90					
0.15	3.5	!	0.039	-1.757	-1.90					
0.225	5		0.058	-1.569	-1.49					
0.4	6		0.071	-1.469	-0.92					
0.45	7		0.084	-1.381	-0.80					
0.5	10.5		0.128	-1.137	-0.69					
0.5	10.5	!	0.128	-1.137	-0.69					
0.5	10.5	!	0.128	-1.137	-0.69					
0.5	10.5	!	0.128	-1.137	-0.69					
0.5	10.5	!	0.128	-1.137	-0.69					
0.5	10.5	!	0.128	-1.137	-0.69					
0.65	14		0.172	-0.947	-0.43					
0.7	15		0.185	-0.898	-0.36					
0.75	16		0.197	-0.852	-0.29					
0.8	17		0.210	-0.807	-0.22					
0.9	18.5		0.229	-0.743	-0.11					
0.9	18.5	!	0.229	-0.743	-0.11					
1	35		0.437	-0.159	0.00					
1	35	!	0.437	-0.159	0.00					
1	35	!	0.437	-0.159	0.00					
1	35	!	0.437	-0.159	0.00					
1	35	!	0.437	-0.159	0.00					
1	35	!	0.437	-0.159	0.00					
1	35	!	0.437	-0.159	0.00					
1	35	!	0.437	-0.159	0.00					
1	35	!	0.437	-0.159	0.00					
1	35	!	0.437	-0.159	0.00					
1	35	!	0.437	-0.159	0.00					
1	35	!	0.437	-0.159	0.00					
1	35	!	0.437	-0.159	0.00					
1	35	!	0.437	-0.159	0.00					
1	35	!	0.437	-0.159	0.00					
1	35	!	0.437	-0.159	0.00					
1	35	!	0.437	-0.159	0.00					
1	35	!	0.437	-0.159	0.00					
1	35	!	0.437	-0.159	0.00					
1	35	!	0.437	-0.159	0.00					
1	35	!	0.437	-0.159	0.00					
1	35	!	0.437	-0.159	0.00					
1	35	!	0.437	-0.159	0.00					
1	35	!	0.437	-0.159	0.00					
1	35	!	0.437	-0.159	0.00					
1	35	!	0.437	-0.159	0.00					
1	35	!	0.437	-0.159	0.00					
1	35	!	0.437	-0.159	0.00					
1	35	!	0.437	-0.159	0.00					
1	35	!	0.437	-0.159	0.00					
1	35	!	0.437	-0.159	0.00					
1	35	!	0.437	-0.159	0.00					
1	35	!	0.437	-0.159	0.00					
1	35	!	0.437	-0.159	0.00					
1.1	53.5		0.670	0.441	0.10					
1.1	53.5	!	0.670	0.441	0.10					
1.1	53.5	!	0.670	0.441	0.10					

Table A-1.5
Statistical Analysis for Cadmium in Soil Tundra
Northeast Cape, St. Lawrence Island, Alaska

$[Cd]_i$	i	ties	quantile	z-score	$ln[Cd]_i$	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
1.1	53.5	!	0.670	0.441	0.10					
1.1	53.5	!	0.670	0.441	0.10					
1.1	53.5	!	0.670	0.441	0.10					
1.2	57.5		0.721	0.585	0.18					
1.2	57.5	!	0.721	0.585	0.18					
1.3	59.5		0.746	0.662	0.26					
1.3	59.5	!	0.746	0.662	0.26					
1.35	61		0.765	0.722	0.30					
1.4	62		0.778	0.764	0.34					
1.8	63		0.790	0.807	0.59					
2	64		0.803	0.852	0.69					
2.2	65		0.815	0.898	0.79					
2.95	66		0.828	0.947	1.08					
3	67		0.841	0.997	1.10					
3.15	68		0.853	1.051	1.15					
3.2	69.5		0.872	1.137	1.16					
3.2	69.5	!	0.872	1.137	1.16					
3.3	71		0.891	1.233	1.19					
4.05	72		0.904	1.303	1.40					
4.1	73		0.916	1.381	1.41					
4.45	74		0.929	1.469	1.49					
6.5	75		0.942	1.569	1.87					
7	76		0.954	1.688	1.95					
7.5	77		0.967	1.837	2.01					
10.25	78		0.979	2.043	2.33					
69	79		0.992	2.414	4.23	3.57	3.26	yes	3.9045	1.59E-02

n	79	
max	69	
min	0.0025	
stdev	7.8	1.2
mean	2.4	0.085
CV	3.2	
Normal r^2	0.19	
Lognormal r^2	0.79	
$k_{0.95;0.95,n}$	2.0	2.0
Normal BUTL	18	
Lognormal BUTL		11

Analysis with outliers removed (1)

$[Cd]_i$	i	ties	quantile	z-score	$ln[Cd]_i$	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
0.1	1		0.008	-2.405	-2.30	2.94	3.26	no	3.1222	1.96E-01
0.15	2.5		0.028	-1.919	-1.90					
0.15	2.5	!	0.028	-1.919	-1.90					
0.225	4		0.047	-1.675	-1.49					
0.4	5		0.060	-1.556	-0.92					
0.45	6		0.073	-1.455	-0.80					
0.5	9.5		0.118	-1.184	-0.69					

Table A-1.5
Statistical Analysis for Cadmium in Soil Tundra
Northeast Cape, St. Lawrence Island, Alaska

$[Cd]_i$	i	ties	quantile	z-score	$ln[Cd]_i$	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
0.5	9.5	!	0.118	-1.184	-0.69					
0.5	9.5	!	0.118	-1.184	-0.69					
0.5	9.5	!	0.118	-1.184	-0.69					
0.5	9.5	!	0.118	-1.184	-0.69					
0.5	9.5	!	0.118	-1.184	-0.69					
0.65	13		0.163	-0.980	-0.43					
0.7	14		0.176	-0.929	-0.36					
0.75	15		0.189	-0.880	-0.29					
0.8	16		0.202	-0.834	-0.22					
0.9	17.5		0.222	-0.767	-0.11					
0.9	17.5	!	0.222	-0.767	-0.11					
1	37		0.474	-0.065	0.00					
1	37	!	0.474	-0.065	0.00					
1	37	!	0.474	-0.065	0.00					
1	37	!	0.474	-0.065	0.00					
1	37	!	0.474	-0.065	0.00					
1	37	!	0.474	-0.065	0.00					
1	37	!	0.474	-0.065	0.00					
1	37	!	0.474	-0.065	0.00					
1	37	!	0.474	-0.065	0.00					
1	37	!	0.474	-0.065	0.00					
1	37	!	0.474	-0.065	0.00					
1	37	!	0.474	-0.065	0.00					
1	37	!	0.474	-0.065	0.00					
1	37	!	0.474	-0.065	0.00					
1	37	!	0.474	-0.065	0.00					
1	37	!	0.474	-0.065	0.00					
1	37	!	0.474	-0.065	0.00					
1	37	!	0.474	-0.065	0.00					
1	37	!	0.474	-0.065	0.00					
1	37	!	0.474	-0.065	0.00					
1	37	!	0.474	-0.065	0.00					
1	37	!	0.474	-0.065	0.00					
1	37	!	0.474	-0.065	0.00					
1	37	!	0.474	-0.065	0.00					
1	37	!	0.474	-0.065	0.00					
1	37	!	0.474	-0.065	0.00					
1	37	!	0.474	-0.065	0.00					
1	37	!	0.474	-0.065	0.00					
1	37	!	0.474	-0.065	0.00					
1	37	!	0.474	-0.065	0.00					
1	37	!	0.474	-0.065	0.00					
1	37	!	0.474	-0.065	0.00					
1	37	!	0.474	-0.065	0.00					
1	37	!	0.474	-0.065	0.00					
1	37	!	0.474	-0.065	0.00					
1	37	!	0.474	-0.065	0.00					
1.1	52.5		0.675	0.453	0.10					
1.1	52.5	!	0.675	0.453	0.10					
1.1	52.5	!	0.675	0.453	0.10					
1.1	52.5	!	0.675	0.453	0.10					
1.1	52.5	!	0.675	0.453	0.10					
1.1	52.5	!	0.675	0.453	0.10					
1.2	56.5		0.727	0.602	0.18					
1.2	56.5	!	0.727	0.602	0.18					
1.3	58.5		0.752	0.682	0.26					
1.3	58.5	!	0.752	0.682	0.26					
1.35	60		0.772	0.745	0.30					

Table A-1.5
Statistical Analysis for Cadmium in Soil Tundra
Northeast Cape, St. Lawrence Island, Alaska

$[Cd]_i$	i	ties	quantile	z-score	$ln[Cd]_i$	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
1.4	61		0.785	0.788	0.34					
1.8	62		0.798	0.834	0.59					
2	63		0.811	0.880	0.69					
2.2	64		0.824	0.929	0.79					
2.95	65		0.837	0.980	1.08					
3	66		0.850	1.034	1.10					
3.15	67		0.862	1.091	1.15					
3.2	68.5		0.882	1.184	1.16					
3.2	68.5	!	0.882	1.184	1.16					
3.3	70		0.901	1.289	1.19					
4.05	71		0.914	1.367	1.40					
4.1	72		0.927	1.455	1.41					
4.45	73		0.940	1.556	1.49					
6.5	74		0.953	1.675	1.87					
7	75		0.966	1.825	1.95					
7.5	76		0.979	2.033	2.01					
10.25	77		0.992	2.405	2.33	2.70	3.26	no	2.8396	4.47E-01

n	77	
max	10.25	
min	0.1000	
stdev	1.8	0.8
mean	1.6	0.110
CV	1.10	
Normal r^2	0.61	
Lognormal r^2	0.92	
$k_{0.95;0.95,n}$	2.0	2.0
Normal BUTL	5.1	
Lognormal BUTL		5.6

Analysis of Data After Data Elimination Based on Visual Inspection

$[Cd]_i$	i	ties	quantile	z-score	$ln[Cd]_i$	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
0.4	1		0.011	-2.293	-0.92	2.38	3.13	no	2.5181	8.40E-01
0.45	2		0.028	-1.905	-0.80					
0.5	5.5		0.090	-1.344	-0.69					
0.5	5.5	!	0.090	-1.344	-0.69					
0.5	5.5	!	0.090	-1.344	-0.69					
0.5	5.5	!	0.090	-1.344	-0.69					
0.5	5.5	!	0.090	-1.344	-0.69					
0.5	5.5	!	0.090	-1.344	-0.69					
0.65	9		0.151	-1.034	-0.43					
0.7	10		0.168	-0.962	-0.36					
0.75	11		0.186	-0.894	-0.29					
0.8	12		0.203	-0.831	-0.22					
0.9	13.5		0.229	-0.741	-0.11					
0.9	13.5	!	0.229	-0.741	-0.11					
1	30		0.517	0.044	0.00					

Table A-1.5
Statistical Analysis for Cadmium in Soil Tundra
Northeast Cape, St. Lawrence Island, Alaska

$[Cd]_i$	i	ties	quantile	z-score	$ln[Cd]_i$	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
1	30	!	0.517	0.044	0.00					
1	30	!	0.517	0.044	0.00					
1	30	!	0.517	0.044	0.00					
1	30	!	0.517	0.044	0.00					
1	30	!	0.517	0.044	0.00					
1	30	!	0.517	0.044	0.00					
1	30	!	0.517	0.044	0.00					
1	30	!	0.517	0.044	0.00					
1	30	!	0.517	0.044	0.00					
1	30	!	0.517	0.044	0.00					
1	30	!	0.517	0.044	0.00					
1	30	!	0.517	0.044	0.00					
1	30	!	0.517	0.044	0.00					
1	30	!	0.517	0.044	0.00					
1	30	!	0.517	0.044	0.00					
1	30	!	0.517	0.044	0.00					
1	30	!	0.517	0.044	0.00					
1	30	!	0.517	0.044	0.00					
1	30	!	0.517	0.044	0.00					
1	30	!	0.517	0.044	0.00					
1	30	!	0.517	0.044	0.00					
1	30	!	0.517	0.044	0.00					
1	30	!	0.517	0.044	0.00					
1	30	!	0.517	0.044	0.00					
1	30	!	0.517	0.044	0.00					
1	30	!	0.517	0.044	0.00					
1	30	!	0.517	0.044	0.00					
1	30	!	0.517	0.044	0.00					
1	30	!	0.517	0.044	0.00					
1	30	!	0.517	0.044	0.00					
1.1	48.5		0.841	0.997	0.10					
1.1	48.5	!	0.841	0.997	0.10					
1.1	48.5	!	0.841	0.997	0.10					
1.1	48.5	!	0.841	0.997	0.10					
1.1	48.5	!	0.841	0.997	0.10					
1.1	48.5	!	0.841	0.997	0.10					
1.2	52.5		0.910	1.344	0.18					
1.2	52.5	!	0.910	1.344	0.18					
1.3	54.5		0.945	1.602	0.26					
1.3	54.5	!	0.945	1.602	0.26					
1.35	56		0.972	1.905	0.30					
1.4	57		0.989	2.293	0.34	1.99	3.13	no	2.0609	2.51E+00

n	57	
max	1.4	
min	0.40	
stdev	0.23	0.29
mean	0.95	-0.093
CV	0.24	
Normal r^2	0.91	
Lognormal r^2	0.83	

Table A-1.5
Statistical Analysis for Cadmium in Soil Tundra
Northeast Cape, St. Lawrence Island, Alaska

	$[Cd]_i$	i	ties	quantile	z-score	$\ln[Cd]_i$	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
$k_{0.95;0.95,n}$	2.0					2.0					
Normal BUTL	1.4										
Lognormal BUTL						1.7					

Note:
Visual inspection of the data resulted in an elimination of values equal to or greater than 1.8 and equal to or less than 0.225 mg/kg.

Table A-1.6
Statistical Analysis for Chromium in Soil Tundra
Northeast Cape, St. Lawrence Island, Alaska

$[Cr]_i$	i	ties	quantile	z-score	$ln[Cr]_i$	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
0.005	1		0.007	-2.445	-5.30	1.10	3.31	no	1.1071	2.33E+01
1	4.5		0.048	-1.666	0.00					
1	4.5	!	0.048	-1.666	0.00					
1	4.5	!	0.048	-1.666	0.00					
1	4.5	!	0.048	-1.666	0.00					
1	4.5	!	0.048	-1.666	0.00					
1	4.5	!	0.048	-1.666	0.00					
1.5	8		0.088	-1.351	0.41					
2.6	9		0.100	-1.282	0.96					
4	10		0.112	-1.218	1.39					
4.7	11		0.123	-1.159	1.55					
5	12.5		0.141	-1.078	1.61					
5	12.5	!	0.141	-1.078	1.61					
5.2	14		0.158	-1.003	1.65					
6.1	15		0.170	-0.956	1.81					
6.5	16		0.181	-0.911	1.87					
6.9	17		0.193	-0.868	1.93					
7.3	18		0.204	-0.826	1.99					
8.5	19		0.216	-0.786	2.14					
8.8	20		0.228	-0.747	2.17					
9.2	21		0.239	-0.709	2.22					
9.7	22		0.251	-0.672	2.27					
10	23.5		0.268	-0.619	2.30					
10	23.5	!	0.268	-0.619	2.30					
10.25	25		0.286	-0.567	2.33					
10.5	26		0.297	-0.533	2.35					
11	27		0.309	-0.500	2.40					
12	28		0.320	-0.467	2.48					
12.3	29		0.332	-0.435	2.51					
13	30.5		0.349	-0.387	2.56					
13	30.5	!	0.349	-0.387	2.56					
13.9	32		0.367	-0.341	2.63					
14	33		0.378	-0.310	2.64					
14.4	34		0.390	-0.280	2.67					
14.5	35		0.401	-0.250	2.67					
14.7	36		0.413	-0.220	2.69					
16	38.5		0.442	-0.146	2.77					
16	38.5	!	0.442	-0.146	2.77					
16	38.5	!	0.442	-0.146	2.77					
16	38.5	!	0.442	-0.146	2.77					
16.5	41.5		0.477	-0.058	2.80					
16.5	41.5	!	0.477	-0.058	2.80					
17	43		0.494	-0.015	2.83					
18	45.5		0.523	0.058	2.89					
18	45.5	!	0.523	0.058	2.89					
18	45.5	!	0.523	0.058	2.89					
18	45.5	!	0.523	0.058	2.89					
19	49		0.564	0.161	2.94					
19	49	!	0.564	0.161	2.94					
19	49	!	0.564	0.161	2.94					
20	53		0.610	0.280	3.00					
20	53	!	0.610	0.280	3.00					
20	53	!	0.610	0.280	3.00					

Table A-1.6
Statistical Analysis for Chromium in Soil Tundra
Northeast Cape, St. Lawrence Island, Alaska

$[Cr]_i$	i	ties	quantile	z-score	$ln[Cr]_i$	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
20	53	!	0.610	0.280	3.00					
20	53	!	0.610	0.280	3.00					
20.5	56		0.645	0.372	3.02					
21	58.5		0.674	0.451	3.04					
21	58.5	!	0.674	0.451	3.04					
21	58.5	!	0.674	0.451	3.04					
21	58.5	!	0.674	0.451	3.04					
22	62		0.714	0.567	3.09					
22	62	!	0.714	0.567	3.09					
22	62	!	0.714	0.567	3.09					
23.2	64		0.738	0.636	3.14					
24	65		0.749	0.672	3.18					
25	66		0.761	0.709	3.22					
26	67		0.772	0.747	3.26					
27	68		0.784	0.786	3.30					
27.4	69		0.796	0.826	3.31					
29.75	70		0.807	0.868	3.39					
31.3	71		0.819	0.911	3.44					
33	72		0.830	0.956	3.50					
36	73		0.842	1.003	3.58					
39.8	74		0.854	1.052	3.68					
41	75.5		0.871	1.131	3.71					
41	75.5	!	0.871	1.131	3.71					
42	77.5		0.894	1.249	3.74					
42	77.5	!	0.894	1.249	3.74					
50	79		0.912	1.351	3.91					
58	80		0.923	1.427	4.06					
59.5	81		0.935	1.512	4.09					
64	82		0.946	1.611	4.16					
65	83		0.958	1.728	4.17					
75	84		0.970	1.874	4.32					
93	85		0.981	2.078	4.53					
100	86		0.993	2.445	4.61	4.05	3.31	yes	4.5112	1.79E-03

n	86		
max	100		
min	0.0050		
stdev	19	1.4	
mean	21	2.6	
CV	0.91		
Normal r^2	0.80		
Lognormal r^2	0.77		
$k_{0.95;0.95,n}$	2.0	2.0	
Normal BUTL	60		
Lognormal BUTL		187	

Analysis with outliers removed (1)

$[Cr]_i$	i	ties	quantile	z-score	$ln[Cr]_i$	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p

Table A-1.6
Statistical Analysis for Chromium in Soil Tundra
Northeast Cape, St. Lawrence Island, Alaska

$[Cr]_i$	i	ties	quantile	z-score	$ln[Cr]_i$	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
0.005	1		0.007	-2.441	-5.30	1.17	3.31	no	1.1747	2.07E+01
1	4.5		0.048	-1.661	0.00					
1	4.5	!	0.048	-1.661	0.00					
1	4.5	!	0.048	-1.661	0.00					
1	4.5	!	0.048	-1.661	0.00					
1	4.5	!	0.048	-1.661	0.00					
1	4.5	!	0.048	-1.661	0.00					
1.5	8		0.089	-1.344	0.41					
2.6	9		0.101	-1.275	0.96					
4	10		0.113	-1.211	1.39					
4.7	11		0.125	-1.152	1.55					
5	12.5		0.142	-1.070	1.61					
5	12.5	!	0.142	-1.070	1.61					
5.2	14		0.160	-0.995	1.65					
6.1	15		0.172	-0.948	1.81					
6.5	16		0.183	-0.903	1.87					
6.9	17		0.195	-0.860	1.93					
7.3	18		0.207	-0.818	1.99					
8.5	19		0.218	-0.777	2.14					
8.8	20		0.230	-0.738	2.17					
9.2	21		0.242	-0.700	2.22					
9.7	22		0.254	-0.663	2.27					
10	23.5		0.271	-0.609	2.30					
10	23.5	!	0.271	-0.609	2.30					
10.25	25		0.289	-0.557	2.33					
10.5	26		0.301	-0.523	2.35					
11	27		0.312	-0.489	2.40					
12	28		0.324	-0.456	2.48					
12.3	29		0.336	-0.424	2.51					
13	30.5		0.353	-0.376	2.56					
13	30.5	!	0.353	-0.376	2.56					
13.9	32		0.371	-0.329	2.63					
14	33		0.383	-0.298	2.64					
14.4	34		0.394	-0.268	2.67					
14.5	35		0.406	-0.237	2.67					
14.7	36		0.418	-0.207	2.69					
16	38.5		0.447	-0.133	2.77					
16	38.5	!	0.447	-0.133	2.77					
16	38.5	!	0.447	-0.133	2.77					
16	38.5	!	0.447	-0.133	2.77					
16.5	41.5		0.482	-0.044	2.80					
16.5	41.5	!	0.482	-0.044	2.80					
17	43		0.500	0.000	2.83					
18	45.5		0.529	0.074	2.89					
18	45.5	!	0.529	0.074	2.89					
18	45.5	!	0.529	0.074	2.89					
18	45.5	!	0.529	0.074	2.89					
19	49		0.570	0.177	2.94					
19	49	!	0.570	0.177	2.94					
19	49	!	0.570	0.177	2.94					
20	53		0.617	0.298	3.00					
20	53	!	0.617	0.298	3.00					
20	53	!	0.617	0.298	3.00					

Table A-1.6
Statistical Analysis for Chromium in Soil Tundra
Northeast Cape, St. Lawrence Island, Alaska

$[Cr]_i$	i	ties	quantile	z-score	$ln[Cr]_i$	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
20	53	!	0.617	0.298	3.00					
20	53	!	0.617	0.298	3.00					
20.5	56		0.652	0.392	3.02					
21	58.5		0.682	0.473	3.04					
21	58.5	!	0.682	0.473	3.04					
21	58.5	!	0.682	0.473	3.04					
21	58.5	!	0.682	0.473	3.04					
22	62		0.723	0.591	3.09					
22	62	!	0.723	0.591	3.09					
22	62	!	0.723	0.591	3.09					
23.2	64		0.746	0.663	3.14					
24	65		0.758	0.700	3.18					
25	66		0.770	0.738	3.22					
26	67		0.782	0.777	3.26					
27	68		0.793	0.818	3.30					
27.4	69		0.805	0.860	3.31					
29.75	70		0.817	0.903	3.39					
31.3	71		0.828	0.948	3.44					
33	72		0.840	0.995	3.50					
36	73		0.852	1.045	3.58					
39.8	74		0.864	1.097	3.68					
41	75.5		0.881	1.181	3.71					
41	75.5	!	0.881	1.181	3.71					
42	77.5		0.905	1.309	3.74					
42	77.5	!	0.905	1.309	3.74					
50	79		0.922	1.421	3.91					
58	80		0.934	1.506	4.06					
59.5	81		0.946	1.605	4.09					
64	82		0.957	1.722	4.16					
65	83		0.969	1.869	4.17					
75	84		0.981	2.074	4.32					
93	85		0.993	2.441	4.53	4.14	3.31	yes	4.6450	1.07E-03

n	85	
max	93	
min	0.0050	
stdev	18	1.3
mean	20	2.5
CV	0.86	
Normal r^2	0.83	
Lognormal r^2	0.76	
$k_{0.95;0.95,n}$	2.0	2.0
Normal BUTL	55	
Lognormal BUTL		179

Analysis with outliers removed (2)

$[Cr]_i$	i	ties	quantile	z-score	$ln[Cr]_i$	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
0.005	1		0.007	-2.436	-5.30	1.25	3.31	no	1.2569	1.78E+01

Table A-1.6
Statistical Analysis for Chromium in Soil Tundra
Northeast Cape, St. Lawrence Island, Alaska

$[Cr]_i$	i	ties	quantile	z-score	$\ln[Cr]_i$	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
1	4.5		0.049	-1.655	0.00					
1	4.5	!	0.049	-1.655	0.00					
1	4.5	!	0.049	-1.655	0.00					
1	4.5	!	0.049	-1.655	0.00					
1	4.5	!	0.049	-1.655	0.00					
1	4.5	!	0.049	-1.655	0.00					
1.5	8		0.091	-1.338	0.41					
2.6	9		0.102	-1.268	0.96					
4	10		0.114	-1.204	1.39					
4.7	11		0.126	-1.145	1.55					
5	12.5		0.144	-1.063	1.61					
5	12.5	!	0.144	-1.063	1.61					
5.2	14		0.162	-0.987	1.65					
6.1	15		0.174	-0.940	1.81					
6.5	16		0.185	-0.895	1.87					
6.9	17		0.197	-0.851	1.93					
7.3	18		0.209	-0.809	1.99					
8.5	19		0.221	-0.769	2.14					
8.8	20		0.233	-0.729	2.17					
9.2	21		0.245	-0.691	2.22					
9.7	22		0.257	-0.654	2.27					
10	23.5		0.274	-0.599	2.30					
10	23.5	!	0.274	-0.599	2.30					
10.25	25		0.292	-0.547	2.33					
10.5	26		0.304	-0.512	2.35					
11	27		0.316	-0.479	2.40					
12	28		0.328	-0.446	2.48					
12.3	29		0.340	-0.413	2.51					
13	30.5		0.358	-0.365	2.56					
13	30.5	!	0.358	-0.365	2.56					
13.9	32		0.375	-0.318	2.63					
14	33		0.387	-0.287	2.64					
14.4	34		0.399	-0.256	2.67					
14.5	35		0.411	-0.225	2.67					
14.7	36		0.423	-0.195	2.69					
16	38.5		0.453	-0.119	2.77					
16	38.5	!	0.453	-0.119	2.77					
16	38.5	!	0.453	-0.119	2.77					
16	38.5	!	0.453	-0.119	2.77					
16.5	41.5		0.488	-0.030	2.80					
16.5	41.5	!	0.488	-0.030	2.80					
17	43		0.506	0.015	2.83					
18	45.5		0.536	0.089	2.89					
18	45.5	!	0.536	0.089	2.89					
18	45.5	!	0.536	0.089	2.89					
18	45.5	!	0.536	0.089	2.89					
19	49		0.577	0.195	2.94					
19	49	!	0.577	0.195	2.94					
19	49	!	0.577	0.195	2.94					
20	53		0.625	0.318	3.00					
20	53	!	0.625	0.318	3.00					
20	53	!	0.625	0.318	3.00					
20	53	!	0.625	0.318	3.00					

Table A-1.6
Statistical Analysis for Chromium in Soil Tundra
Northeast Cape, St. Lawrence Island, Alaska

$[Cr]_i$	i	ties	quantile	z-score	$ln[Cr]_i$	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
20	53	!	0.625	0.318	3.00					
20.5	56		0.660	0.413	3.02					
21	58.5		0.690	0.496	3.04					
21	58.5	!	0.690	0.496	3.04					
21	58.5	!	0.690	0.496	3.04					
21	58.5	!	0.690	0.496	3.04					
22	62		0.731	0.617	3.09					
22	62	!	0.731	0.617	3.09					
22	62	!	0.731	0.617	3.09					
23.2	64		0.755	0.691	3.14					
24	65		0.767	0.729	3.18					
25	66		0.779	0.769	3.22					
26	67		0.791	0.809	3.26					
27	68		0.803	0.851	3.30					
27.4	69		0.815	0.895	3.31					
29.75	70		0.826	0.940	3.39					
31.3	71		0.838	0.987	3.44					
33	72		0.850	1.037	3.50					
36	73		0.862	1.089	3.58					
39.8	74		0.874	1.145	3.68					
41	75.5		0.892	1.236	3.71					
41	75.5	!	0.892	1.236	3.71					
42	77.5		0.915	1.375	3.74					
42	77.5	!	0.915	1.375	3.74					
50	79		0.933	1.500	3.91					
58	80		0.945	1.599	4.06					
59.5	81		0.957	1.717	4.09					
64	82		0.969	1.864	4.16					
65	83		0.981	2.069	4.17					
75	84		0.993	2.436	4.32	3.53	3.31	yes	3.8292	2.10E-02

n	84	
max	75	
min	0.0050	
stdev	16	1.3
mean	20	2.5
CV	0.80	
Normal r^2	0.87	
Lognormal r^2	0.75	
$k_{0.95;0.95,n}$	2.0	2.0
Normal BUTL	51	
Lognormal BUTL		172

Analysis with outliers removed (3)

$[Cr]_i$	i	ties	quantile	z-score	$ln[Cr]_i$	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
0.005	1		0.008	-2.432	-5.30	1.30	3.31	no	1.3114	1.61E+01
1	4.5		0.050	-1.649	0.00					
1	4.5	!	0.050	-1.649	0.00					

Table A-1.6
Statistical Analysis for Chromium in Soil Tundra
Northeast Cape, St. Lawrence Island, Alaska

$[Cr]_i$	i	ties	quantile	z-score	$ln[Cr]_i$	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
1	4.5	!	0.050	-1.649	0.00					
1	4.5	!	0.050	-1.649	0.00					
1	4.5	!	0.050	-1.649	0.00					
1	4.5	!	0.050	-1.649	0.00					
1.5	8		0.092	-1.331	0.41					
2.6	9		0.104	-1.261	0.96					
4	10		0.116	-1.197	1.39					
4.7	11		0.128	-1.138	1.55					
5	12.5		0.146	-1.055	1.61					
5	12.5	!	0.146	-1.055	1.61					
5.2	14		0.164	-0.980	1.65					
6.1	15		0.176	-0.932	1.81					
6.5	16		0.188	-0.886	1.87					
6.9	17		0.200	-0.843	1.93					
7.3	18		0.212	-0.800	1.99					
8.5	19		0.224	-0.760	2.14					
8.8	20		0.236	-0.720	2.17					
9.2	21		0.248	-0.682	2.22					
9.7	22		0.260	-0.644	2.27					
10	23.5		0.278	-0.589	2.30					
10	23.5	!	0.278	-0.589	2.30					
10.25	25		0.296	-0.537	2.33					
10.5	26		0.308	-0.502	2.35					
11	27		0.320	-0.468	2.40					
12	28		0.332	-0.435	2.48					
12.3	29		0.344	-0.402	2.51					
13	30.5		0.362	-0.353	2.56					
13	30.5	!	0.362	-0.353	2.56					
13.9	32		0.380	-0.306	2.63					
14	33		0.392	-0.274	2.64					
14.4	34		0.404	-0.243	2.67					
14.5	35		0.416	-0.212	2.67					
14.7	36		0.428	-0.182	2.69					
16	38.5		0.458	-0.106	2.77					
16	38.5	!	0.458	-0.106	2.77					
16	38.5	!	0.458	-0.106	2.77					
16	38.5	!	0.458	-0.106	2.77					
16.5	41.5		0.494	-0.015	2.80					
16.5	41.5	!	0.494	-0.015	2.80					
17	43		0.512	0.030	2.83					
18	45.5		0.542	0.106	2.89					
18	45.5	!	0.542	0.106	2.89					
18	45.5	!	0.542	0.106	2.89					
18	45.5	!	0.542	0.106	2.89					
19	49		0.584	0.212	2.94					
19	49	!	0.584	0.212	2.94					
19	49	!	0.584	0.212	2.94					
20	53		0.632	0.338	3.00					
20	53	!	0.632	0.338	3.00					
20	53	!	0.632	0.338	3.00					
20	53	!	0.632	0.338	3.00					
20	53	!	0.632	0.338	3.00					
20.5	56		0.668	0.435	3.02					

Table A-1.6
Statistical Analysis for Chromium in Soil Tundra
Northeast Cape, St. Lawrence Island, Alaska

	$[Cr]_i$	i	ties	quantile	z-score	$ln[Cr]_i$	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
	21	58.5		0.698	0.519	3.04					
	21	58.5	!	0.698	0.519	3.04					
	21	58.5	!	0.698	0.519	3.04					
	21	58.5	!	0.698	0.519	3.04					
	22	62		0.740	0.644	3.09					
	22	62	!	0.740	0.644	3.09					
	22	62	!	0.740	0.644	3.09					
	23.2	64		0.764	0.720	3.14					
	24	65		0.776	0.760	3.18					
	25	66		0.788	0.800	3.22					
	26	67		0.800	0.843	3.26					
	27	68		0.812	0.886	3.30					
	27.4	69		0.824	0.932	3.31					
	29.75	70		0.836	0.980	3.39					
	31.3	71		0.848	1.029	3.44					
	33	72		0.860	1.082	3.50					
	36	73		0.872	1.138	3.58					
	39.8	74		0.884	1.197	3.68					
	41	75.5		0.902	1.295	3.71					
	41	75.5	!	0.902	1.295	3.71					
	42	77.5		0.926	1.450	3.74					
	42	77.5	!	0.926	1.450	3.74					
	50	79		0.944	1.593	3.91					
	58	80		0.956	1.711	4.06					
	59.5	81		0.968	1.859	4.09					
	64	82		0.980	2.064	4.16					
	65	83		0.992	2.432	4.17	3.17	3.31	no	3.3813	9.24E-02
n	83										
max	65										
min	0.0050										
stdev	15					1.3					
mean	19					2.5					
CV	0.77										
Normal r^2	0.89										
Lognormal r^2	0.74										
$k_{0.95;0.95,n}$	2.0					2.0					
Normal BUTL	48										
Lognormal BUTL						166					

Table A-1.7
Statistical Analysis for Cobalt in Soil Tundra
Northeast Cape, St. Lawrence Island, Alaska

$[Co]_i$	i	ties	quantile	z-score	$ln[Co]_i$	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
1	1		0.023	-1.997	0.00	1.78	2.86	no	1.9089	1.83E+00
1	2	!	0.060	-1.558	0.00					
1.35	3.5		0.115	-1.202	0.30					
1.35	3.5	!	0.115	-1.202	0.30					
2	5		0.170	-0.955	0.69					
2.5	6		0.206	-0.819	0.92					
3.2	7		0.243	-0.696	1.16					
3.8	8		0.280	-0.583	1.34					
4	9		0.317	-0.477	1.39					
4.5	10		0.353	-0.377	1.50					
4.7	11		0.390	-0.280	1.55					
5	12		0.427	-0.185	1.61					
5.1	13		0.463	-0.092	1.63					
5.2	14		0.500	0.000	1.65					
5.55	15		0.537	0.092	1.71					
6	16		0.573	0.185	1.79					
6.9	17		0.610	0.280	1.93					
7	18		0.647	0.377	1.95					
8.3	19		0.683	0.477	2.12					
11.2	20		0.720	0.583	2.42					
12.1	21		0.757	0.696	2.49					
14.2	22		0.794	0.819	2.65					
17	23.5		0.849	1.031	2.83					
17	23.5	!	0.849	1.031	2.83					
19	25		0.904	1.303	2.94					
23	26		0.940	1.558	3.14					
38	27		0.977	1.997	3.64	1.99	2.86	no	2.1628	1.09E+00

n	27	
max	38	
min	1.0	
stdev	8.4	0.96
mean	8.5	1.7
CV	0.99	
Normal r^2	0.78	
Lognormal r^2	0.98	
$k_{0.95;0.95,n}$	2.3	2.3
Normal BUTL	28	
Lognormal BUTL		49

Table A-1.8
Statistical Analysis for Copper in Soil Tundra
Northeast Cape, St. Lawrence Island, Alaska

$[Cu]_i$	i	ties	quantile	z-score	$ln[Cu]_i$	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
2	1		0.008	-2.409	0.69	2.20	3.26	no	2.2737	2.01E+00
2.8	2		0.021	-2.038	1.03					
4	3		0.034	-1.831	1.39					
4.3	4		0.046	-1.682	1.46					
4.4	5		0.059	-1.562	1.48					
6	6		0.072	-1.462	1.79					
6.6	7		0.085	-1.374	1.89					
7.1	8		0.097	-1.296	1.96					
8	9		0.110	-1.225	2.08					
8.1	10		0.123	-1.160	2.09					
8.5	11		0.136	-1.099	2.14					
8.9	12		0.149	-1.043	2.19					
8.95	13		0.161	-0.989	2.19					
9.3	14		0.174	-0.938	2.23					
9.6	15		0.187	-0.889	2.26					
9.95	16		0.200	-0.843	2.30					
10	17		0.212	-0.798	2.30					
10.6	18		0.225	-0.755	2.36					
11	20		0.251	-0.672	2.40					
11	20	!	0.251	-0.672	2.40					
11	20	!	0.251	-0.672	2.40					
12	24		0.302	-0.519	2.48					
12	24	!	0.302	-0.519	2.48					
12	24	!	0.302	-0.519	2.48					
12	24	!	0.302	-0.519	2.48					
12	24	!	0.302	-0.519	2.48					
13	27		0.340	-0.412	2.56					
13.6	28		0.353	-0.377	2.61					
13.95	29		0.366	-0.343	2.64					
14	31.5		0.398	-0.259	2.64					
14	31.5	!	0.398	-0.259	2.64					
14	31.5	!	0.398	-0.259	2.64					
14	31.5	!	0.398	-0.259	2.64					
15	34.5		0.436	-0.161	2.71					
15	34.5	!	0.436	-0.161	2.71					
15.9	36		0.455	-0.112	2.77					
16	37.5		0.474	-0.064	2.77					
16	37.5	!	0.474	-0.064	2.77					
16.4	39		0.494	-0.016	2.80					
18	40.5		0.513	0.032	2.89					
18	40.5	!	0.513	0.032	2.89					
22	42		0.532	0.080	3.09					
23	43.5		0.551	0.128	3.14					
23	43.5	!	0.551	0.128	3.14					
23.7	45		0.570	0.177	3.17					
24	46		0.583	0.210	3.18					
27	47		0.596	0.243	3.30					
27.2	48		0.609	0.276	3.30					
27.5	49		0.621	0.309	3.31					
28	50		0.634	0.343	3.33					
28.3	51		0.647	0.377	3.34					
29	52		0.660	0.412	3.37					
33	53		0.673	0.447	3.50					

Table A-1.8
Statistical Analysis for Copper in Soil Tundra
Northeast Cape, St. Lawrence Island, Alaska

$[Cu]_i$	i	ties	quantile	z-score	$ln[Cu]_i$	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
34.5	54		0.685	0.483	3.54					
36.3	55		0.698	0.519	3.59					
37.3	56		0.711	0.556	3.62					
37.4	57		0.724	0.594	3.62					
43	58		0.736	0.632	3.76					
50	59		0.749	0.672	3.91					
51	60		0.762	0.713	3.93					
54.6	61		0.775	0.755	4.00					
57	62		0.788	0.798	4.04					
64	63		0.800	0.843	4.16					
67	64		0.813	0.889	4.20					
70.5	65		0.826	0.938	4.26					
85	66		0.839	0.989	4.44					
86.8	67		0.851	1.043	4.46					
91	68		0.864	1.099	4.51					
94	69		0.877	1.160	4.54					
97	70		0.890	1.225	4.57					
100	71		0.903	1.296	4.61					
120	72.5		0.922	1.417	4.79					
120	72.5	!	0.922	1.417	4.79					
130	74		0.941	1.562	4.87					
212	75		0.954	1.682	5.36					
320	76		0.966	1.831	5.77					
368	77		0.979	2.038	5.91					
429	78		0.992	2.409	6.06	2.64	3.26	no	2.7644	5.58E-01

n	78	
max	429	
min	2.0	
stdev	76	1.1
mean	46	3.1
CV	1.6	
Normal r^2	0.53	
Lognormal r^2	0.97	
$k_{0.95;0.95,n}$	2.0	2.0
Normal BUTL	196	
Lognormal BUTL		205

Analysis of Data After Data Elimination Based on Visual Inspection

$[Cu]_i$	i	ties	quantile	z-score	$ln[Cu]_i$	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
2	1		0.009	-2.375	0.69	2.51	3.26	no	2.6328	7.41E-01
2.8	2		0.023	-1.999	1.03					
4	3		0.037	-1.789	1.39					
4.3	4		0.051	-1.636	1.46					
4.4	5		0.065	-1.515	1.48					
6	6		0.079	-1.412	1.79					
6.6	7		0.093	-1.323	1.89					

Table A-1.8
Statistical Analysis for Copper in Soil Tundra
Northeast Cape, St. Lawrence Island, Alaska

$[Cu]_i$	i	ties	quantile	z-score	$ln[Cu]_i$	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
7.1	8		0.107	-1.243	1.96					
8	9		0.121	-1.170	2.08					
8.1	10		0.135	-1.103	2.09					
8.5	11		0.149	-1.040	2.14					
8.9	12		0.163	-0.982	2.19					
8.95	13		0.177	-0.926	2.19					
9.3	14		0.191	-0.873	2.23					
9.6	15		0.205	-0.823	2.26					
9.95	16		0.219	-0.775	2.30					
10	17		0.233	-0.728	2.30					
10.6	18		0.247	-0.683	2.36					
11	20		0.275	-0.596	2.40					
11	20	!	0.275	-0.596	2.40					
11	20	!	0.275	-0.596	2.40					
12	24		0.332	-0.436	2.48					
12	24	!	0.332	-0.436	2.48					
12	24	!	0.332	-0.436	2.48					
12	24	!	0.332	-0.436	2.48					
12	24	!	0.332	-0.436	2.48					
13	27		0.374	-0.322	2.56					
13.6	28		0.388	-0.285	2.61					
13.95	29		0.402	-0.249	2.64					
14	31.5		0.437	-0.159	2.64					
14	31.5	!	0.437	-0.159	2.64					
14	31.5	!	0.437	-0.159	2.64					
14	31.5	!	0.437	-0.159	2.64					
15	34.5		0.479	-0.053	2.71					
15	34.5	!	0.479	-0.053	2.71					
15.9	36		0.500	0.000	2.77					
16	37.5		0.521	0.053	2.77					
16	37.5	!	0.521	0.053	2.77					
16.4	39		0.542	0.106	2.80					
18	40.5		0.563	0.159	2.89					
18	40.5	!	0.563	0.159	2.89					
22	42		0.584	0.213	3.09					
23	43.5		0.605	0.267	3.14					
23	43.5	!	0.605	0.267	3.14					
23.7	45		0.626	0.322	3.17					
24	46		0.640	0.359	3.18					
27	47		0.654	0.397	3.30					
27.2	48		0.668	0.436	3.30					
27.5	49		0.682	0.475	3.31					
28	50		0.696	0.514	3.33					
28.3	51		0.711	0.555	3.34					
29	52		0.725	0.596	3.37					
33	53		0.739	0.639	3.50					
34.5	54		0.753	0.683	3.54					
36.3	55		0.767	0.728	3.59					
37.3	56		0.781	0.775	3.62					
37.4	57		0.795	0.823	3.62					
43	58		0.809	0.873	3.76					
50	59		0.823	0.926	3.91					
51	60		0.837	0.982	3.93					

Table A-1.8
Statistical Analysis for Copper in Soil Tundra
Northeast Cape, St. Lawrence Island, Alaska

	$[Cu]_i$	i	ties	quantile	z-score	$ln[Cu]_i$	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
	54.6	61		0.851	1.040	4.00					
	57	62		0.865	1.103	4.04					
	64	63		0.879	1.170	4.16					
	67	64		0.893	1.243	4.20					
	70.5	65		0.907	1.323	4.26					
	85	66		0.921	1.412	4.44					
	86.8	67		0.935	1.515	4.46					
	91	68		0.949	1.636	4.51					
	94	69		0.963	1.789	4.54					
	97	70		0.977	1.999	4.57					
	100	71		0.991	2.375	4.61	1.91	3.26	no	1.9588	3.85E+00
n	71										
max	100										
min	2.0										
stdev	25					0.89					
mean	27					2.9					
CV	0.94										
Normal r^2	0.78										
Lognormal r^2	0.98										
$k_{0.95;0.95,n}$	2.0					2.0					
Normal BUTL	78										
Lognormal BUTL						107					

Note:
Visual inspection of the data resulted in an elimination of values greater than 100 mg/kg.

Table A-1.9
Statistical Analysis for Lead in Soil Tundra
Northeast Cape, St. Lawrence Island, Alaska

$[Pb]_i$	i	ties	quantile	z-score	$ln[Pb]_i$	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
0.015	1		0.007	-2.457	-4.20	5.45	3.31	yes	6.7076	1.70E-07
4	2		0.018	-2.092	1.39					
4.6	3		0.029	-1.890	1.53					
4.8	4		0.041	-1.744	1.57					
5	6		0.063	-1.530	1.61					
5	6	!	0.063	-1.530	1.61					
5	6	!	0.063	-1.530	1.61					
6.1	8		0.085	-1.369	1.81					
7.4	9		0.097	-1.301	2.00					
10	10.5		0.113	-1.208	2.30					
10	10.5	!	0.113	-1.208	2.30					
11	12		0.130	-1.125	2.40					
11.4	13		0.141	-1.074	2.43					
12	14		0.153	-1.025	2.48					
13	17		0.186	-0.892	2.56					
13	17	!	0.186	-0.892	2.56					
13	17	!	0.186	-0.892	2.56					
13	17	!	0.186	-0.892	2.56					
13	17	!	0.186	-0.892	2.56					
13.4	20		0.220	-0.773	2.60					
14	21		0.231	-0.735	2.64					
15	22.5		0.248	-0.681	2.71					
15	22.5	!	0.248	-0.681	2.71					
16	24.5		0.270	-0.612	2.77					
16	24.5	!	0.270	-0.612	2.77					
17	26.5		0.293	-0.545	2.83					
17	26.5	!	0.293	-0.545	2.83					
18	28.5		0.315	-0.481	2.89					
18	28.5	!	0.315	-0.481	2.89					
19	30.5		0.338	-0.419	2.94					
19	30.5	!	0.338	-0.419	2.94					
20	33.5		0.371	-0.329	3.00					
20	33.5	!	0.371	-0.329	3.00					
20	33.5	!	0.371	-0.329	3.00					
20	33.5	!	0.371	-0.329	3.00					
21	36.5		0.405	-0.241	3.04					
21	36.5	!	0.405	-0.241	3.04					
22	38		0.422	-0.198	3.09					
23	39		0.433	-0.169	3.14					
24	41		0.455	-0.113	3.18					
24	41	!	0.455	-0.113	3.18					
24	41	!	0.455	-0.113	3.18					
25	43		0.478	-0.056	3.22					
26	44		0.489	-0.028	3.26					
27	45		0.500	0.000	3.30					
27.5	46		0.511	0.028	3.31					
28	47		0.522	0.056	3.33					
30	48.5		0.539	0.098	3.40					
30	48.5	!	0.539	0.098	3.40					
31	50		0.556	0.141	3.43					
33	51.5		0.573	0.184	3.50					
33	51.5	!	0.573	0.184	3.50					
34	53		0.590	0.227	3.53					

Table A-1.9
Statistical Analysis for Lead in Soil Tundra
Northeast Cape, St. Lawrence Island, Alaska

35.5	54		0.601	0.256	3.57					
36	55		0.612	0.285	3.58					
39	56.5		0.629	0.329	3.66					
39	56.5	!	0.629	0.329	3.66					
40	58		0.646	0.374	3.69					
41	59.5		0.662	0.419	3.71					
41	59.5	!	0.662	0.419	3.71					
42	61		0.679	0.466	3.74					
48	62.5		0.696	0.513	3.87					
48	62.5	!	0.696	0.513	3.87					
49	64		0.713	0.562	3.89					
53	65		0.724	0.595	3.97					
58	66.5		0.741	0.646	4.06					
58	66.5	!	0.741	0.646	4.06					
62.7	68		0.758	0.699	4.14					
64	69		0.769	0.735	4.16					
65	70.5		0.786	0.792	4.17					
65	70.5	!	0.786	0.792	4.17					
67	72		0.803	0.851	4.20					
76	73		0.814	0.892	4.33					
79	74		0.825	0.934	4.37					
86	75		0.836	0.979	4.45					
88	76		0.847	1.025	4.48					
92	77		0.859	1.074	4.52					
140	78		0.870	1.125	4.94					
157.5	79		0.881	1.180	5.06					
160	80		0.892	1.238	5.08					
190	81		0.903	1.301	5.25					
210	82		0.915	1.369	5.35					
220	83		0.926	1.445	5.39					
280	84		0.937	1.530	5.63					
350	85		0.948	1.627	5.86					
419	86		0.959	1.744	6.04					
460	87		0.971	1.890	6.13					
604	88		0.982	2.092	6.40					
630	89		0.993	2.457	6.45	2.19	3.31	no	2.2541	2.38E+00

n	89		
max	630		
min	0.015		
stdev	118		1.4
mean	69		3.4
CV	1.7		
Normal r^2	0.52		
Lognormal r^2	0.86		
$k_{0.95;0.95,n}$	2.0		2.0
Normal BUTL	302		
Lognormal BUTL			464

Table A-1.9
Statistical Analysis for Lead in Soil Tundra
Northeast Cape, St. Lawrence Island, Alaska

Analysis with outliers removed (1)

$[Pb]_i$	i	ties	quantile	z-score	$ln[Pb]_i$	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
4	1		0.007	-2.453	1.39	1.84	3.31	no	1.8747	5.65E+00
4.6	2		0.018	-2.088	1.53					
4.8	3		0.030	-1.885	1.57					
5	5		0.052	-1.622	1.61					
5	5	!	0.052	-1.622	1.61					
5	5	!	0.052	-1.622	1.61					
6.1	7		0.075	-1.439	1.81					
7.4	8		0.086	-1.363	2.00					
10	9.5		0.103	-1.262	2.30					
10	9.5	!	0.103	-1.262	2.30					
11	11		0.120	-1.173	2.40					
11.4	12		0.132	-1.118	2.43					
12	13		0.143	-1.067	2.48					
13	16		0.177	-0.927	2.56					
13	16	!	0.177	-0.927	2.56					
13	16	!	0.177	-0.927	2.56					
13	16	!	0.177	-0.927	2.56					
13	16	!	0.177	-0.927	2.56					
13.4	19		0.211	-0.803	2.60					
14	20		0.222	-0.764	2.64					
15	21.5		0.239	-0.708	2.71					
15	21.5	!	0.239	-0.708	2.71					
16	23.5		0.262	-0.637	2.77					
16	23.5	!	0.262	-0.637	2.77					
17	25.5		0.285	-0.569	2.83					
17	25.5	!	0.285	-0.569	2.83					
18	27.5		0.307	-0.503	2.89					
18	27.5	!	0.307	-0.503	2.89					
19	29.5		0.330	-0.440	2.94					
19	29.5	!	0.330	-0.440	2.94					
20	32.5		0.364	-0.348	3.00					
20	32.5	!	0.364	-0.348	3.00					
20	32.5	!	0.364	-0.348	3.00					
20	32.5	!	0.364	-0.348	3.00					
21	35.5		0.398	-0.258	3.04					
21	35.5	!	0.398	-0.258	3.04					
22	37		0.415	-0.215	3.09					
23	38		0.426	-0.186	3.14					
24	40		0.449	-0.128	3.18					
24	40	!	0.449	-0.128	3.18					
24	40	!	0.449	-0.128	3.18					
25	42		0.472	-0.071	3.22					
26	43		0.483	-0.043	3.26					
27	44		0.494	-0.014	3.30					
27.5	45		0.506	0.014	3.31					
28	46		0.517	0.043	3.33					
30	47.5		0.534	0.085	3.40					
30	47.5	!	0.534	0.085	3.40					
31	49		0.551	0.128	3.43					
33	50.5		0.568	0.171	3.50					
33	50.5	!	0.568	0.171	3.50					
34	52		0.585	0.215	3.53					

Table A-1.9
Statistical Analysis for Lead in Soil Tundra
Northeast Cape, St. Lawrence Island, Alaska

35.5	53		0.596	0.244	3.57					
36	54		0.608	0.273	3.58					
39	55.5		0.625	0.318	3.66					
39	55.5	!	0.625	0.318	3.66					
40	57		0.642	0.363	3.69					
41	58.5		0.659	0.409	3.71					
41	58.5	!	0.659	0.409	3.71					
42	60		0.676	0.456	3.74					
48	61.5		0.693	0.503	3.87					
48	61.5	!	0.693	0.503	3.87					
49	63		0.710	0.552	3.89					
53	64		0.721	0.586	3.97					
58	65.5		0.738	0.637	4.06					
58	65.5	!	0.738	0.637	4.06					
62.7	67		0.755	0.690	4.14					
64	68		0.766	0.727	4.16					
65	69.5		0.783	0.783	4.17					
65	69.5	!	0.783	0.783	4.17					
67	71		0.800	0.843	4.20					
76	72		0.812	0.884	4.33					
79	73		0.823	0.927	4.37					
86	74		0.834	0.971	4.45					
88	75		0.846	1.018	4.48					
92	76		0.857	1.067	4.52					
140	77		0.868	1.118	4.94					
157.5	78		0.880	1.173	5.06					
160	79		0.891	1.232	5.08					
190	80		0.902	1.295	5.25					
210	81		0.914	1.363	5.35					
220	82		0.925	1.439	5.39					
280	83		0.936	1.524	5.63					
350	84		0.948	1.622	5.86					
419	85		0.959	1.738	6.04					
460	86		0.970	1.885	6.13					
604	87		0.982	2.088	6.40					
630	88		0.993	2.453	6.45	2.61	3.31	no	2.7172	7.00E-01

n	88		
max	630		
min	4.000		
stdev	119	1.1	
mean	69	3.5	
CV	1.7		
Normal r^2	0.50		
Lognormal r^2	0.96		
$k_{0.95;0.95,n}$	2.0	2.0	
Normal BUTL	304		
Lognormal BUTL		306	

Table A-1.9
Statistical Analysis for Lead in Soil Tundra
Northeast Cape, St. Lawrence Island, Alaska

Analysis of Data After Data Elimination Based on Visual Inspection

$[Pb]_i$	i	ties	quantile	z-score	$ln[Pb]_i$	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
4	1		0.008	-2.400	1.39	2.26	3.26	no	2.3395	1.67E+00
4.6	2		0.021	-2.027	1.53					
4.8	3		0.034	-1.819	1.57					
5	5		0.061	-1.549	1.61					
5	5	!	0.061	-1.549	1.61					
5	5	!	0.061	-1.549	1.61					
6.1	7		0.087	-1.360	1.81					
7.4	8		0.100	-1.282	2.00					
10	9.5		0.120	-1.177	2.30					
10	9.5	!	0.120	-1.177	2.30					
11	11		0.139	-1.083	2.40					
11.4	12		0.152	-1.026	2.43					
12	13		0.166	-0.972	2.48					
13	16		0.205	-0.824	2.56					
13	16	!	0.205	-0.824	2.56					
13	16	!	0.205	-0.824	2.56					
13	16	!	0.205	-0.824	2.56					
13	16	!	0.205	-0.824	2.56					
13.4	19		0.244	-0.693	2.60					
14	20		0.257	-0.651	2.64					
15	21.5		0.277	-0.592	2.71					
15	21.5	!	0.277	-0.592	2.71					
16	23.5		0.303	-0.515	2.77					
16	23.5	!	0.303	-0.515	2.77					
17	25.5		0.330	-0.441	2.83					
17	25.5	!	0.330	-0.441	2.83					
18	27.5		0.356	-0.370	2.89					
18	27.5	!	0.356	-0.370	2.89					
19	29.5		0.382	-0.300	2.94					
19	29.5	!	0.382	-0.300	2.94					
20	32.5		0.421	-0.199	3.00					
20	32.5	!	0.421	-0.199	3.00					
20	32.5	!	0.421	-0.199	3.00					
20	32.5	!	0.421	-0.199	3.00					
21	35.5		0.461	-0.099	3.04					
21	35.5	!	0.461	-0.099	3.04					
22	37		0.480	-0.049	3.09					
23	38		0.493	-0.016	3.14					
24	40		0.520	0.049	3.18					
24	40	!	0.520	0.049	3.18					
24	40	!	0.520	0.049	3.18					
25	42		0.546	0.115	3.22					
26	43		0.559	0.148	3.26					
27	44		0.572	0.182	3.30					
27.5	45		0.585	0.215	3.31					
28	46		0.598	0.249	3.33					
30	47.5		0.618	0.300	3.40					
30	47.5	!	0.618	0.300	3.40					
31	49		0.638	0.352	3.43					
33	50.5		0.657	0.405	3.50					
33	50.5	!	0.657	0.405	3.50					
34	52		0.677	0.459	3.53					

Table A-1.9
Statistical Analysis for Lead in Soil Tundra
Northeast Cape, St. Lawrence Island, Alaska

35.5	53		0.690	0.496	3.57					
36	54		0.703	0.534	3.58					
39	55.5		0.723	0.592	3.66					
39	55.5	!	0.723	0.592	3.66					
40	57		0.743	0.651	3.69					
41	58.5		0.762	0.714	3.71					
41	58.5	!	0.762	0.714	3.71					
42	60		0.782	0.779	3.74					
48	61.5		0.802	0.847	3.87					
48	61.5	!	0.802	0.847	3.87					
49	63		0.821	0.920	3.89					
53	64		0.834	0.972	3.97					
58	65.5		0.854	1.054	4.06					
58	65.5	!	0.854	1.054	4.06					
62.7	67		0.874	1.144	4.14					
64	68		0.887	1.210	4.16					
65	69.5		0.907	1.320	4.17					
65	69.5	!	0.907	1.320	4.17					
67	71		0.926	1.448	4.20					
76	72		0.939	1.549	4.33					
79	73		0.952	1.669	4.37					
86	74		0.966	1.819	4.45					
88	75		0.979	2.027	4.48					
92	76		0.992	2.400	4.52	1.78	3.26	no	1.8236	5.49E+00

n	76		
max	92		
min	4.0		
stdev	22	0.78	
mean	30	3.1	
CV	0.73		
Normal r^2	0.89		
Lognormal r^2	0.98		
$k_{0.95;0.95,n}$	2.0	2.0	
Normal BUTL	73		
Lognormal BUTL		106	

Note:
Visual inspection of the data resulted in an elimination of values greater than 92 mg/kg.

Table A-1.10
Statistical Analysis for Manganese in Soil Tundra
Northeast Cape, St. Lawrence Island, Alaska

$[Mn]_i$	i	ties	quantile	z-score	$ln[Mn]_i$	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
8	1		0.023	-1.997	2.08	2.60	2.86	no	3.0451	1.46E-01
22	2		0.060	-1.558	3.09					
43	3		0.096	-1.303	3.76					
50.5	4		0.133	-1.112	3.92					
55.3	5		0.170	-0.955	4.01					
77.2	6		0.206	-0.819	4.35					
79.5	7		0.243	-0.696	4.38					
83.55	8		0.280	-0.583	4.43					
119.5	9		0.317	-0.477	4.78					
125	10		0.353	-0.377	4.83					
151	11		0.390	-0.280	5.02					
154	12		0.427	-0.185	5.04					
163	13		0.463	-0.092	5.09					
164	14		0.500	0.000	5.10					
182	15		0.537	0.092	5.20					
247	16		0.573	0.185	5.51					
249	17		0.610	0.280	5.52					
320	18		0.647	0.377	5.77					
452	19		0.683	0.477	6.11					
520	20		0.720	0.583	6.25					
559	21		0.757	0.696	6.33					
560	22		0.794	0.819	6.33					
625.5	23		0.830	0.955	6.44					
694	24		0.867	1.112	6.54					
765	25		0.904	1.303	6.64					
786	26		0.940	1.558	6.67					
970	27		0.977	1.997	6.88	1.42	2.86	no	1.4743	4.13E+00

n	27	
max	970	
min	8.0	
stdev	279	1.2
mean	305	5.2
CV	0.92	
Normal r^2	0.87	
Lognormal r^2	0.95	
$k_{0.95;0.95,n}$	2.3	2.3
Normal BUTL	936	
Lognormal BUTL		2660

Analysis of Windsorized Data

$[Mn]_i$	i	ties	quantile	z-score	$ln[Mn]_i$	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
43	1		0.027	-1.929	3.76	1.03	2.78	no	1.0526	7.00E+00
50.5	2		0.070	-1.477	3.92					
55.3	3		0.113	-1.211	4.01					
77.2	4		0.156	-1.011	4.35					
79.5	5		0.199	-0.845	4.38					
83.55	6		0.242	-0.700	4.43					

Table A-1.10
Statistical Analysis for Manganese in Soil Tundra
Northeast Cape, St. Lawrence Island, Alaska

	$[Mn]_i$	i	ties	quantile	z-score	$ln[Mn]_i$	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
	119.5	7		0.285	-0.568	4.78					
	125	8		0.328	-0.446	4.83					
	151	9		0.371	-0.329	5.02					
	154	10		0.414	-0.217	5.04					
	163	11		0.457	-0.108	5.09					
	164	12		0.500	0.000	5.10					
	182	13		0.543	0.108	5.20					
	247	14		0.586	0.217	5.51					
	249	15		0.629	0.329	5.52					
	320	16		0.672	0.446	5.77					
	452	17		0.715	0.568	6.11					
	520	18		0.758	0.700	6.25					
	559	19		0.801	0.845	6.33					
	560	20		0.844	1.011	6.33					
	625.5	21		0.887	1.211	6.44					
	694	22		0.930	1.477	6.54					
	765	23		0.973	1.929	6.64	2.10	2.78	no	2.3625	6.41E-01

n	23		
max	765		
min	43.00		
stdev	231		0.90
mean	280		5.3
CV	0.82		
Normal r^2	0.86		
Lognormal r^2	0.96		
$k_{0.95;0.95,n}$	2.3		2.3
Normal BUTL	817		
Lognormal BUTL			1589

Note:
Visual inspection of the data resulted in windorizing the data for elimination of the 2 lowest and 2 highest values.

Table A-1.11
Statistical Analysis for Mercury in Soil Tundra
Northeast Cape, St. Lawrence Island, Alaska

$[Hg]_i$	i	ties	quantile	z-score	$ln[Hg]_i$	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
0.0001	1		0.010	-2.342	-9.21	5.08	3.20	yes	6.6056	6.29E-07
0.03	3		0.040	-1.748	-3.51					
0.03	3	!	0.040	-1.748	-3.51					
0.03	3	!	0.040	-1.748	-3.51					
0.035	5		0.071	-1.469	-3.35					
0.05	21		0.316	-0.479	-3.00					
0.05	21	!

Table A-1.11
Statistical Analysis for Mercury in Soil Tundra
Northeast Cape, St. Lawrence Island, Alaska

	$[Hg]_i$	i	ties	quantile	z-score	$ln[Hg]_i$	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
	0.56	62		0.944	1.593	-0.58					
	0.6	63		0.960	1.748	-0.51					
	3.1	64		0.975	1.962	1.13					
	4.8	65		0.990	2.342	1.57	3.01	3.20	no	3.2522	1.20E-01
n	65										
max	4.8										
min	0.00010										
stdev	0.70					1.3					
mean	0.24					-2.4					
CV	2.9										
Normal r^2	0.30										
Lognormal r^2	0.80										
$k_{0.95;0.95,n}$	2.0					2.0					
Normal BUTL	1.6										
Lognormal BUTL						1.2					

Analysis with outliers removed (1)

$[Hg]_i$	i	ties	quantile	z-score	$ln[Hg]_i$	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
0.03	2		0.025	-1.955	-3.51	1.13	3.20	no	1.1446	1.64E+01
0.03	2	!	0.025	-1.955	-3.51					
0.03	2	!	0.025	-1.955	-3.51					
0.035	4		0.056	-1.586	-3.35					
0.05	20		0.305	-0.509	-3.00					
0.05	20	!

Table A-1.11
Statistical Analysis for Mercury in Soil Tundra
Northeast Cape, St. Lawrence Island, Alaska

	$[Hg]_i$	i	ties	quantile	z-score	$\ln[Hg]_i$	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
	0.1	40.5		0.625	0.317	-2.30					
	0.1	40.5	!	0.625	0.317	-2.30					
	0.1	40.5	!	0.625	0.317	-2.30					
	0.1	40.5	!	0.625	0.317	-2.30					
	0.1	40.5	!	0.625	0.317	-2.30					
	0.1	40.5	!	0.625	0.317	-2.30					
	0.125	44		0.679	0.465	-2.08					
	0.15	47		0.726	0.600	-1.90					
	0.15	47	!	0.726	0.600	-1.90					
	0.15	47	!	0.726	0.600	-1.90					
	0.15	47	!	0.726	0.600	-1.90					
	0.15	47	!	0.726	0.600	-1.90					
	0.16	50		0.772	0.747	-1.83					
	0.2	51.5		0.796	0.826	-1.61					
	0.2	51.5	!	0.796	0.826	-1.61					
	0.25	53		0.819	0.912	-1.39					
	0.26	54		0.835	0.973	-1.35					
	0.275	55		0.850	1.037	-1.29					
	0.3	56.5		0.874	1.143	-1.20					
	0.3	56.5	!	0.874	1.143	-1.20					
	0.35	58		0.897	1.264	-1.05					
	0.47	59		0.912	1.356	-0.76					
	0.5	60		0.928	1.461	-0.69					
	0.56	61		0.944	1.586	-0.58					
	0.6	62		0.959	1.741	-0.51					
	3.1	63		0.975	1.955	1.13					
	4.8	64		0.990	2.337	1.57	3.78	3.20	yes	4.3120	3.78E-03
n	64										
max	4.8										
min	0.03000										
stdev	0.70					1.0					
mean	0.24					-2.3					
CV	2.9										
Normal r^2	0.30										
Lognormal r^2	0.87										
$k_{0.95;0.95,n}$	2.0					2.0					
Normal BUTL	1.65										
Lognormal BUTL						0.77					

Analysis with outliers removed (2)

$[Hg]_i$	i	ties	quantile	z-score	$\ln[Hg]_i$	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
0.03	2		0.026	-1.948	-3.51	1.21	3.20	no	1.2282	1.41E+01
0.03	2	!	0.026	-1.948	-3.51					
0.03	2	!	0.026	-1.948	-3.51					
0.035	4		0.057	-1.578	-3.35					
0.05	20		0.310	-0.495	-3.00					
0.05	20	!	0.310	-0.495	-3.00					
0.05	20	!	0.310	-0.495	-3.00					
0.05	20	!	0.310	-0.495	-3.00					
0.05	20	!	0.310	-0.495	-3.00					
0.05	20	!	0.310	-0.495	-3.00					
0.05	20	!	0.310	-0.495	-3.00					
0.05	20	!	0.310	-0.495	-3.00					
0.05	20	!	0.310	-0.495	-3.00					
0.05	20	!	0.310	-0.495	-3.00					

Table A-1.11
Statistical Analysis for Mercury in Soil Tundra
Northeast Cape, St. Lawrence Island, Alaska

$[Hg]_i$	i	ties	quantile	z-score	$ln[Hg]_i$	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
0.05	20	!	0.310	-0.495	-3.00					
0.05	20	!	0.310	-0.495	-3.00					
0.05	20	!	0.310	-0.495	-3.00					
0.05	20	!	0.310	-0.495	-3.00					
0.05	20	!	0.310	-0.495	-3.00					
0.05	20	!	0.310	-0.495	-3.00					
0.05	20	!	0.310	-0.495	-3.00					
0.05	20	!	0.310	-0.495	-3.00					
0.05	20	!	0.310	-0.495	-3.00					
0.05	20	!	0.310	-0.495	-3.00					
0.05	20	!	0.310	-0.495	-3.00					
0.05	20	!	0.310	-0.495	-3.00					
0.05	20	!	0.310	-0.495	-3.00					
0.05	20	!	0.310	-0.495	-3.00					
0.05	20	!	0.310	-0.495	-3.00					
0.05	20	!	0.310	-0.495	-3.00					
0.05	20	!	0.310	-0.495	-3.00					
0.05	20	!	0.310	-0.495	-3.00					
0.05	20	!	0.310	-0.495	-3.00					
0.05	20	!	0.310	-0.495	-3.00					
0.05	20	!	0.310	-0.495	-3.00					
0.07	36		0.563	0.159	-2.66					
0.09	37		0.579	0.199	-2.41					
0.1	40.5		0.634	0.343	-2.30					
0.1	40.5	!	0.634	0.343	-2.30					
0.1	40.5	!	0.634	0.343	-2.30					
0.1	40.5	!	0.634	0.343	-2.30					
0.1	40.5	!	0.634	0.343	-2.30					
0.1	40.5	!	0.634	0.343	-2.30					
0.125	44		0.690	0.495	-2.08					
0.15	47		0.737	0.635	-1.90					
0.15	47	!	0.737	0.635	-1.90					
0.15	47	!	0.737	0.635	-1.90					
0.15	47	!	0.737	0.635	-1.90					
0.15	47	!	0.737	0.635	-1.90					
0.16	50		0.785	0.788	-1.83					
0.2	51.5		0.808	0.872	-1.61					
0.2	51.5	!	0.808	0.872	-1.61					
0.25	53		0.832	0.962	-1.39					
0.26	54		0.848	1.027	-1.35					
0.275	55		0.864	1.097	-1.29					
0.3	56.5		0.887	1.213	-1.20					
0.3	56.5	!	0.887	1.213	-1.20					
0.35	58		0.911	1.347	-1.05					
0.47	59		0.927	1.453	-0.76					
0.5	60		0.943	1.578	-0.69					
0.56	61		0.958	1.734	-0.58					
0.6	62		0.974	1.948	-0.51					
3.1	63		0.990	2.331	1.13	3.87	3.20	yes	4.4503	2.34E-03

n	63	
max	3.10	
min	0.03000	
stdev	0.40	0.9
mean	0.17	-2.4
CV	2.3	
Normal r^2	0.33	
Lognormal r^2	0.90	

Table A-1.11
Statistical Analysis for Mercury in Soil Tundra
Northeast Cape, St. Lawrence Island, Alaska

	$[Hg]_i$	i	ties	quantile	z-score	$ln[Hg]_i$	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
$k_{0.95;0.95,n}$	2.0					2.0					
Normal BUTL	0.97										
Lognormal BUTL						0.57					

Analysis with outliers removed (3)

$[Hg]_i$	i	ties	quantile	z-score	$ln[Hg]_i$	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
0.03	2		0.026	-1.941	-3.51	1.31	3.20	no	1.3332	1.16E+01
0.03	2	!	0.026	-1.941	-3.51					
0.03	2	!	0.026	-1.941	-3.51					
0.035	4		0.058	-1.570	-3.35					
0.05	20		0.315	-0.481	-3.00					
0.05	20	!

Table A-1.11
Statistical Analysis for Mercury in Soil Tundra
Northeast Cape, St. Lawrence Island, Alaska

$[Hg]_i$	i	ties	quantile	z-score	$ln[Hg]_i$	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
0.25	53		0.845	1.017	-1.39					
0.26	54		0.861	1.087	-1.35					
0.275	55		0.878	1.163	-1.29					
0.3	56.5		0.902	1.291	-1.20					
0.3	56.5	!	0.902	1.291	-1.20					
0.35	58		0.926	1.445	-1.05					
0.47	59		0.942	1.570	-0.76					
0.5	60		0.958	1.726	-0.69					
0.56	61		0.974	1.941	-0.58					
0.6	62		0.990	2.325	-0.51	2.43	3.20	no	2.5616	8.03E-01

n	62	
max	0.6	
min	0.03000	
stdev	0.13	0.8
mean	0.12	-2.5
CV	1.06	
Normal r^2	0.75	
Lognormal r^2	0.93	
$k_{0.95;0.95,n}$	2.0	2.0
Normal BUTL	0.39	
Lognormal BUTL		0.43

Table A-1.12
Statistical Analysis for Nickel in Soil Tundra
Northeast Cape, St. Lawrence Island, Alaska

$[Ni]_i$	i	ties	quantile	z-score	$ln[Ni]_i$	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
2.5	8		0.097	-1.296	0.92	1.38	3.26	no	1.3993	1.29E+01
2.5	8	!	0.097	-1.296	0.92					
2.5	8	!	0.097	-1.296	0.92					
2.5	8	!	0.097	-1.296	0.92					
2.5	8	!	0.097	-1.296	0.92					
2.5	8	!	0.097	-1.296	0.92					
2.5	8	!	0.097	-1.296	0.92					
2.5	8	!	0.097	-1.296	0.92					
2.5	8	!	0.097	-1.296	0.92					
2.5	8	!	0.097	-1.296	0.92					
2.5	8	!	0.097	-1.296	0.92					
2.5	8	!	0.097	-1.296	0.92					
2.5	8	!	0.097	-1.296	0.92					
2.5	8	!	0.097	-1.296	0.92					
2.5	8	!	0.097	-1.296	0.92					
2.75	16		0.200	-0.843	1.01					
3	17		0.212	-0.798	1.10					
3.5	18		0.225	-0.755	1.25					
3.8	19		0.238	-0.713	1.34					
4.3	20		0.251	-0.672	1.46					
5	21		0.264	-0.632	1.61					
5.1	22		0.276	-0.594	1.63					
5.5	23		0.289	-0.556	1.70					
5.8	24		0.302	-0.519	1.76					
6.5	25		0.315	-0.483	1.87					
7.25	26		0.327	-0.447	1.98					
7.5	27		0.340	-0.412	2.01					
7.6	28		0.353	-0.377	2.03					
7.65	29		0.366	-0.343	2.03					
7.9	30		0.379	-0.309	2.07					
8.7	31		0.391	-0.276	2.16					
9	32		0.404	-0.243	2.20					
9.8	33		0.417	-0.210	2.28					
10	35		0.442	-0.145	2.30					
10	35	!	0.442	-0.145	2.30					
10	35	!	0.442	-0.145	2.30					
10.5	37		0.468	-0.080	2.35					
11	39.5		0.500	0.000	2.40					
11	39.5	!	0.500	0.000	2.40					
11	39.5	!	0.500	0.000	2.40					
11	39.5	!	0.500	0.000	2.40					
11.5	42		0.532	0.080	2.44					
12	43.5		0.551	0.128	2.48					
12	43.5	!	0.551	0.128	2.48					
13	47		0.596	0.243	2.56					
13	47	!	0.596	0.243	2.56					
13	47	!	0.596	0.243	2.56					
13	47	!	0.596	0.243	2.56					
13	47	!	0.596	0.243	2.56					
14	50		0.634	0.343	2.64					
15	52		0.660	0.412	2.71					
15	52	!	0.660	0.412	2.71					
15	52	!	0.660	0.412	2.71					
16	55.5		0.704	0.537	2.77					
16	55.5	!	0.704	0.537	2.77					
16	55.5	!	0.704	0.537	2.77					
16	55.5	!	0.704	0.537	2.77					
16.5	58		0.736	0.632	2.80					

Table A-1.12
Statistical Analysis for Nickel in Soil Tundra
Northeast Cape, St. Lawrence Island, Alaska

$[Ni]_i$	i	ties	quantile	z-score	$ln[Ni]_i$	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
17	60		0.762	0.713	2.83					
17	60	!	0.762	0.713	2.83					
17	60	!	0.762	0.713	2.83					
18	62		0.788	0.798	2.89					
22	63		0.800	0.843	3.09					
23	64		0.813	0.889	3.14					
24	65		0.826	0.938	3.18					
25.5	66		0.839	0.989	3.24					
26	67		0.851	1.043	3.26					
27	68		0.864	1.099	3.30					
28	69		0.877	1.160	3.33					
33	70		0.890	1.225	3.50					
35	71		0.903	1.296	3.56					
36	72		0.915	1.374	3.58					
37	73		0.928	1.462	3.61					
43	74		0.941	1.562	3.76					
44	75		0.954	1.682	3.78					
57	76		0.966	1.831	4.04					
110	77		0.979	2.038	4.70					
280	78		0.992	2.409	5.63	3.34	3.26	yes	3.6210	4.11E-02

	$[Ni]_i$	$ln[Ni]_i$
n	78	
max	280	
min	2.5	
stdev	34	1.0
mean	18	2.3
CV	1.9	
Normal r^2	0.38	
Lognormal r^2	0.97	
$k_{0.95;0.95,n}$	2.0	2.0
Normal BUTL	85	
Lognormal BUTL		71

Analysis with outliers removed (1)

$[Ni]_i$	i	ties	quantile	z-score	$ln[Ni]_i$	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
2.5	8		0.099	-1.289	0.92	1.44	3.26	no	1.4599	1.14E+01
2.5	8	!	0.099	-1.289	0.92					
2.5	8	!	0.099	-1.289	0.92					
2.5	8	!	0.099	-1.289	0.92					
2.5	8	!	0.099	-1.289	0.92					
2.5	8	!	0.099	-1.289	0.92					
2.5	8	!	0.099	-1.289	0.92					
2.5	8	!	0.099	-1.289	0.92					
2.5	8	!	0.099	-1.289	0.92					
2.5	8	!	0.099	-1.289	0.92					
2.5	8	!	0.099	-1.289	0.92					
2.5	8	!	0.099	-1.289	0.92					
2.5	8	!	0.099	-1.289	0.92					
2.5	8	!	0.099	-1.289	0.92					
2.5	8	!	0.099	-1.289	0.92					
2.75	16		0.202	-0.834	1.01					
3	17		0.215	-0.788	1.10					
3.5	18		0.228	-0.745	1.25					
3.8	19		0.241	-0.703	1.34					

Table A-1.12
Statistical Analysis for Nickel in Soil Tundra
Northeast Cape, St. Lawrence Island, Alaska

$[Ni]_i$	i	ties	quantile	z-score	$ln[Ni]_i$	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
4.3	20		0.254	-0.662	1.46					
5	21		0.267	-0.622	1.61					
5.1	22		0.280	-0.583	1.63					
5.5	23		0.293	-0.545	1.70					
5.8	24		0.306	-0.508	1.76					
6.5	25		0.319	-0.471	1.87					
7.25	26		0.332	-0.435	1.98					
7.5	27		0.345	-0.400	2.01					
7.6	28		0.358	-0.365	2.03					
7.65	29		0.371	-0.330	2.03					
7.9	30		0.383	-0.296	2.07					
8.7	31		0.396	-0.263	2.16					
9	32		0.409	-0.229	2.20					
9.8	33		0.422	-0.196	2.28					
10	35		0.448	-0.130	2.30					
10	35	!	0.448	-0.130	2.30					
10	35	!	0.448	-0.130	2.30					
10.5	37		0.474	-0.065	2.35					
11	39.5		0.506	0.016	2.40					
11	39.5	!	0.506	0.016	2.40					
11	39.5	!	0.506	0.016	2.40					
11	39.5	!	0.506	0.016	2.40					
11.5	42		0.539	0.097	2.44					
12	43.5		0.558	0.147	2.48					
12	43.5	!	0.558	0.147	2.48					
13	47		0.604	0.263	2.56					
13	47	!	0.604	0.263	2.56					
13	47	!	0.604	0.263	2.56					
13	47	!	0.604	0.263	2.56					
13	47	!	0.604	0.263	2.56					
14	50		0.642	0.365	2.64					
15	52		0.668	0.435	2.71					
15	52	!	0.668	0.435	2.71					
15	52	!	0.668	0.435	2.71					
16	55.5		0.714	0.564	2.77					
16	55.5	!	0.714	0.564	2.77					
16	55.5	!	0.714	0.564	2.77					
16	55.5	!	0.714	0.564	2.77					
16.5	58		0.746	0.662	2.80					
17	60		0.772	0.745	2.83					
17	60	!	0.772	0.745	2.83					
17	60	!	0.772	0.745	2.83					
18	62		0.798	0.834	2.89					
22	63		0.811	0.880	3.09					
23	64		0.824	0.929	3.14					
24	65		0.837	0.980	3.18					
25.5	66		0.850	1.034	3.24					
26	67		0.862	1.091	3.26					
27	68		0.875	1.152	3.30					
28	69		0.888	1.218	3.33					
33	70		0.901	1.289	3.50					
35	71		0.914	1.367	3.56					
36	72		0.927	1.455	3.58					
37	73		0.940	1.556	3.61					
43	74		0.953	1.675	3.76					
44	75		0.966	1.825	3.78					
57	76		0.979	2.033	4.04					
110	77		0.992	2.405	4.70	2.64	3.26	no	2.7690	5.45E-01

Table A-1.12
Statistical Analysis for Nickel in Soil Tundra
Northeast Cape, St. Lawrence Island, Alaska

	$[Ni]_i$	i	ties	quantile	z-score	$ln[Ni]_i$	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
n	77										
max	110										
min	2.5										
stdev	16					0.93					
mean	14					2.3					
CV	1.1										
Normal r^2	0.70										
Lognormal r^2	0.98										
$k_{0.95;0.95,n}$	2.0					2.0					
Normal BUTL	45										
Lognormal BUTL						59					

Table A-1.13
Statistical Analysis for Thallium in Soil Tundra
Northeast Cape, St. Lawrence Island, Alaska

$[Tl]_i$	i	ties	quantile	z-score	$ln[Tl]_i$	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
0.065	1		0.008	-2.409	-2.73	3.98	3.26	yes	4.4728	2.08E-03
0.28	2.5		0.027	-1.924	-1.27					
0.28	2.5	!	0.027	-1.924	-1.27					
0.43	4		0.046	-1.682	-0.84					
0.53	5		0.059	-1.562	-0.63					
0.65	6		0.072	-1.462	-0.43					
0.7	7		0.085	-1.374	-0.36					
1.2	8		0.097	-1.296	0.18					
3	9.5		0.117	-1.192	1.10					
3	9.5	!	0.117	-1.192	1.10					
3.5	11.5		0.142	-1.071	1.25					
3.5	11.5	!	0.142	-1.071	1.25					
4	13.5		0.168	-0.963	1.39					
4	13.5	!	0.168	-0.963	1.39					
4.75	15		0.187	-0.889	1.56					
5	17		0.212	-0.798	1.61					
5	17	!	0.212	-0.798	1.61					
5	17	!	0.212	-0.798	1.61					
10	37.5		0.474	-0.064	2.30					
10	37.5	!

Table A-1.13
Statistical Analysis for Thallium in Soil Tundra
Northeast Cape, St. Lawrence Island, Alaska

$[Tl]_i$	i	ties	quantile	z-score	$ln[Tl]_i$	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
11	59	!	0.749	0.672	2.40					
11	59	!	0.749	0.672	2.40					
11	59	!	0.749	0.672	2.40					
12	65.5		0.832	0.963	2.48					
15	65.5		0.832	0.963	2.71					
15	65.5	!	0.832	0.963	2.71					
15	65.5	!	0.832	0.963	2.71					
15	65.5	!	0.832	0.963	2.71					
15	65.5	!	0.832	0.963	2.71					
15	65.5	!	0.832	0.963	2.71					
15	65.5	!	0.832	0.963	2.71					
25	70		0.890	1.225	3.22					
29.5	71		0.903	1.296	3.38					
30	72		0.915	1.374	3.40					
32	73		0.928	1.462	3.47					
33	74		0.941	1.562	3.50					
40.5	75		0.954	1.682	3.70					
44.5	76		0.966	1.831	3.80					
65	77		0.979	2.038	4.17					
75	78		0.992	2.409	4.32	1.88	3.26	no	1.9241	4.53E+00

n	78	
max	75	
min	0.065	
stdev	13	1.2
mean	12	2.1
CV	1.0	
Normal r^2	0.66	
Lognormal r^2	0.83	
$k_{0.95;0.95,n}$	2.0	2.0
Normal BUTL	37	
Lognormal BUTL		84

Analysis with outliers removed (1)

$[Tl]_i$	i	ties	quantile	z-score	$ln[Tl]_i$	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
0.28	1.5		0.015	-2.182	-1.27	3.15	3.26	no	3.3772	8.96E-02
0.28	1.5	!	0.015	-2.182	-1.27					
0.43	3		0.034	-1.825	-0.84					
0.53	4		0.047	-1.675	-0.63					
0.65	5		0.060	-1.556	-0.43					
0.7	6		0.073	-1.455	-0.36					
1.2	7		0.086	-1.367	0.18					
3	8.5		0.105	-1.253	1.10					
3	8.5	!	0.105	-1.253	1.10					
3.5	10.5		0.131	-1.121	1.25					
3.5	10.5	!	0.131	-1.121	1.25					
4	12.5		0.157	-1.007	1.39					
4	12.5	!	0.157	-1.007	1.39					
4.75	14		0.176	-0.929	1.56					
5	16		0.202	-0.834	1.61					
5	16	!	0.202	-0.834	1.61					
5	16	!	0.202	-0.834	1.61					
10	36.5		0.468	-0.081	2.30					
10	36.5	!	0.468	-0.081	2.30					

Table A-1.13
Statistical Analysis for Thallium in Soil Tundra
Northeast Cape, St. Lawrence Island, Alaska

$[Tl]_i$	i	ties	quantile	z-score	$ln[Tl]_i$	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
10	36.5	!	0.468	-0.081	2.30					
10	36.5	!	0.468	-0.081	2.30					
10	36.5	!	0.468	-0.081	2.30					
10	36.5	!	0.468	-0.081	2.30					
10	36.5	!	0.468	-0.081	2.30					
10	36.5	!	0.468	-0.081	2.30					
10	36.5	!	0.468	-0.081	2.30					
10	36.5	!	0.468	-0.081	2.30					
10	36.5	!	0.468	-0.081	2.30					
10	36.5	!	0.468	-0.081	2.30					
10	36.5	!	0.468	-0.081	2.30					
10	36.5	!	0.468	-0.081	2.30					
10	36.5	!	0.468	-0.081	2.30					
10	36.5	!	0.468	-0.081	2.30					
10	36.5	!	0.468	-0.081	2.30					
10	36.5	!	0.468	-0.081	2.30					
10	36.5	!	0.468	-0.081	2.30					
10	36.5	!	0.468	-0.081	2.30					
10	36.5	!	0.468	-0.081	2.30					
10	36.5	!	0.468	-0.081	2.30					
10	36.5	!	0.468	-0.081	2.30					
10	36.5	!	0.468	-0.081	2.30					
10	36.5	!	0.468	-0.081	2.30					
10	36.5	!	0.468	-0.081	2.30					
10	36.5	!	0.468	-0.081	2.30					
10	36.5	!	0.468	-0.081	2.30					
10	36.5	!	0.468	-0.081	2.30					
10	36.5	!	0.468	-0.081	2.30					
10	36.5	!	0.468	-0.081	2.30					
10	36.5	!	0.468	-0.081	2.30					
10	36.5	!	0.468	-0.081	2.30					
10	36.5	!	0.468	-0.081	2.30					
10	36.5	!	0.468	-0.081	2.30					
10	36.5	!	0.468	-0.081	2.30					
11	58		0.746	0.662	2.40					
11	58	!	0.746	0.662	2.40					
11	58	!	0.746	0.662	2.40					
11	58	!	0.746	0.662	2.40					
11	58	!	0.746	0.662	2.40					
12	61		0.785	0.788	2.48					
15	65		0.837	0.980	2.71					
15	65	!	0.837	0.980	2.71					
15	65	!	0.837	0.980	2.71					
15	65	!	0.837	0.980	2.71					
15	65	!	0.837	0.980	2.71					
15	65	!	0.837	0.980	2.71					
15	65	!	0.837	0.980	2.71					
25	69		0.888	1.218	3.22					
29.5	70		0.901	1.289	3.38					
30	71		0.914	1.367	3.40					
32	72		0.927	1.455	3.47					
33	73		0.940	1.556	3.50					
40.5	74		0.953	1.675	3.70					
44.5	75		0.966	1.825	3.80					
65	76		0.979	2.033	4.17					
75	77		0.992	2.405	4.32	2.04	3.26	no	2.0994	3.01E+00

Table A-1.13
Statistical Analysis for Thallium in Soil Tundra
Northeast Cape, St. Lawrence Island, Alaska

	$[Tl]_i$	i	ties	quantile	z-score	$ln[Tl]_i$	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
n	77										
max	75										
min	0.280										
stdev	13					1.1					
mean	13					2.1					
CV	1.00										
Normal r^2	0.66										
Lognormal r^2	0.85										
$k_{0.95;0.95,n}$	2.0					2.0					
Normal BUTL	37										
Lognormal BUTL						70					

Analysis of Data After Data Elimination Based on Chemical Analysis Method

	$[Tl]_i$	i	ties	quantile	z-score	$ln[Tl]_i$	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
	0.065	1		0.076	-1.434	-2.73	1.30	2.13	no	1.5167	1.44E+00
	0.28	2.5		0.258	-0.651	-1.27					
	0.28	2.5	!	0.258	-0.651	-1.27					
	0.43	4		0.439	-0.153	-0.84					
	0.53	5		0.561	0.153	-0.63					
	0.65	6		0.682	0.473	-0.43					
	0.7	7		0.803	0.852	-0.36					
	1.2	8		0.924	1.434	0.18	1.97	2.13	no	3.2195	1.45E-01
n	8										
max	1.2										
min	0.065										
stdev	0.35					0.88					
mean	0.52					-0.92					
CV	0.67										
Normal r^2	0.94										
Lognormal r^2	0.90										
$k_{0.95;0.95,n}$	3.2					3.2					
Normal BUTL	1.6										
Lognormal BUTL						6.5					

Note:
Thallium results analyzed by the 6010 method were eliminated. Only those results analyzed by the 7841 method are included.

Table A-1.14
Statistical Analysis for Vanadium in Soil Tundra
Northeast Cape, St. Lawrence Island, Alaska

$[V]_i$	i	ties	quantile	z-score	$\ln[V]_i$	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
1.5	1		0.023	-1.997	0.41	1.57	2.86	no	1.6558	2.98E+00
4	2		0.060	-1.558	1.39					
8.3	3		0.096	-1.303	2.12					
8.5	4		0.133	-1.112	2.14					
9.8	5		0.170	-0.955	2.28					
10	6		0.206	-0.819	2.30					
12.7	7		0.243	-0.696	2.54					
21	8		0.280	-0.583	3.04					
24	9		0.317	-0.477	3.18					
25.4	10		0.353	-0.377	3.23					
25.8	11		0.390	-0.280	3.25					
29	12		0.427	-0.185	3.37					
30	13.5		0.482	-0.046	3.40					
30	13.5	!	0.482	-0.046	3.40					
31	15		0.537	0.092	3.43					
34.7	16		0.573	0.185	3.55					
34.8	17		0.610	0.280	3.55					
38	18		0.647	0.377	3.64					
38.8	19		0.683	0.477	3.66					
40	20		0.720	0.583	3.69					
41.3	21		0.757	0.696	3.72					
44	22		0.794	0.819	3.78					
46	23		0.830	0.955	3.83					
50.1	24		0.867	1.112	3.91					
51.6	25		0.904	1.303	3.94					
62.6	26		0.940	1.558	4.14					
81.1	27		0.977	1.997	4.40	2.69	2.86	no	3.1836	1.04E-01

n	27	
max	81.1	
min	1.5	
stdev	19	0.90
mean	31	3.2
CV	0.60	
Normal r^2	0.96	
Lognormal r^2	0.86	
$k_{0.95;0.95,n}$	2.3	2.3
Normal BUTL	73	
Lognormal BUTL		178

Table A-1.15
Statistical Analysis for Zinc in Soil Tundra
Northeast Cape, St. Lawrence Island, Alaska

$[Zn]_i$	i	ties	quantile	z-score	$ln[Zn]_i$	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
9	1		0.007	-2.441	2.20	2.01	3.31	no	2.0637	3.58E+00
12	2		0.019	-2.074	2.48					
13	3		0.031	-1.869	2.56					
15	4.5		0.048	-1.661	2.71					
15	4.5	!	0.048	-1.661	2.71					
24	6.5		0.072	-1.462	3.18					
24	6.5	!	0.072	-1.462	3.18					
29	8		0.089	-1.344	3.37					
29.5	9		0.101	-1.275	3.38					
29.8	10		0.113	-1.211	3.39					
30	12		0.136	-1.097	3.40					
30	12	!	0.136	-1.097	3.40					
30	12	!	0.136	-1.097	3.40					
31	14.5		0.166	-0.971	3.43					
31	14.5	!	0.166	-0.971	3.43					
34	16		0.183	-0.903	3.53					
35	17		0.195	-0.860	3.56					
35.5	18		0.207	-0.818	3.57					
37	19		0.218	-0.777	3.61					
38	20.5		0.236	-0.719	3.64					
38	20.5	!	0.236	-0.719	3.64					
39	22		0.254	-0.663	3.66					
40	23		0.265	-0.627	3.69					
42	24		0.277	-0.591	3.74					
43.5	25		0.289	-0.557	3.77					
44.3	26		0.301	-0.523	3.79					
49.3	27		0.312	-0.489	3.90					
52	28		0.324	-0.456	3.95					
54	29		0.336	-0.424	3.99					
55	31.5		0.365	-0.345	4.01					
55	31.5	!	0.365	-0.345	4.01					
55	31.5	!	0.365	-0.345	4.01					
55	31.5	!	0.365	-0.345	4.01					
58	34		0.394	-0.268	4.06					
62	35.5		0.412	-0.222	4.13					
62	35.5	!	0.412	-0.222	4.13					
63.2	37		0.430	-0.177	4.15					
65	38		0.441	-0.148	4.17					
66	39		0.453	-0.118	4.19					
67	40		0.465	-0.088	4.20					
68	41		0.477	-0.059	4.22					
71	42		0.488	-0.029	4.26					
84	43		0.500	0.000	4.43					
89	44.5		0.518	0.044	4.49					
89	44.5	!	0.518	0.044	4.49					
93	46.5		0.541	0.103	4.53					
93	46.5	!	0.541	0.103	4.53					
99	48		0.559	0.148	4.60					
99.5	49		0.570	0.177	4.60					
100	50		0.582	0.207	4.61					
110	51		0.594	0.237	4.70					
124	52		0.606	0.268	4.82					
130	53		0.617	0.298	4.87					
133	54		0.629	0.329	4.89					
150	55.5		0.647	0.376	5.01					
150	55.5	!	0.647	0.376	5.01					
160	57		0.664	0.424	5.08					
166	58		0.676	0.456	5.11					

Table A-1.15
Statistical Analysis for Zinc in Soil Tundra
Northeast Cape, St. Lawrence Island, Alaska

$[Zn]_i$	i	ties	quantile	z-score	$ln[Zn]_i$	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
167	59		0.688	0.489	5.12					
170	60		0.699	0.523	5.14					
175	61		0.711	0.557	5.16					
181	62		0.723	0.591	5.20					
184	63		0.735	0.627	5.21					
190	64		0.746	0.663	5.25					
195	65		0.758	0.700	5.27					
200	66		0.770	0.738	5.30					
203	67		0.782	0.777	5.31					
227	68		0.793	0.818	5.42					
230	69		0.805	0.860	5.44					
256	70		0.817	0.903	5.55					
277.5	71		0.828	0.948	5.63					
294	72		0.840	0.995	5.68					
351.5	73		0.852	1.045	5.86					
430	74		0.864	1.097	6.06					
440	75		0.875	1.152	6.09					
444	76		0.887	1.211	6.10					
470	77		0.899	1.275	6.15					
540	78		0.911	1.344	6.29					
554	79		0.922	1.421	6.32					
665.5	80		0.934	1.506	6.50					
776	81		0.946	1.605	6.65					
1130	82		0.957	1.722	7.03					
1480	83		0.969	1.869	7.30					
1790	84		0.981	2.074	7.49					
2300	85		0.993	2.441	7.74	2.70	3.31	no	2.8316	4.94E-01

n	85		
max	2300		
min	9.0		
stdev	373		1.2
mean	211		4.6
CV	1.8		
Normal r^2	0.50		
Lognormal r^2	0.97		
$k_{0.95;0.95,n}$	2.0		2.0
Normal BUTL	947		
Lognormal BUTL			973

Analysis of Data After Data Elimination Based on Visual Inspection

$[Zn]_i$	i	ties	quantile	z-score	$ln[Zn]_i$	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
9	1		0.008	-2.423	2.20	2.20	3.31	no	2.2662	2.12E+00
12	2		0.020	-2.054	2.48					
13	3		0.032	-1.848	2.56					
15	4.5		0.051	-1.637	2.71					
15	4.5	!	0.051	-1.637	2.71					
24	6.5		0.075	-1.437	3.18					
24	6.5	!	0.075	-1.437	3.18					
29	8		0.094	-1.317	3.37					
29.5	9		0.106	-1.247	3.38					
29.8	10		0.118	-1.183	3.39					
30	12		0.143	-1.067	3.40					
30	12	!	0.143	-1.067	3.40					

Table A-1.15
Statistical Analysis for Zinc in Soil Tundra
Northeast Cape, St. Lawrence Island, Alaska

$[Zn]_i$	i	ties	quantile	z-score	$ln[Zn]_i$	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
30	12	!	0.143	-1.067	3.40					
31	14.5		0.174	-0.939	3.43					
31	14.5	!	0.174	-0.939	3.43					
34	16		0.192	-0.869	3.53					
35	17		0.205	-0.825	3.56					
35.5	18		0.217	-0.783	3.57					
37	19		0.229	-0.741	3.61					
38	20.5		0.248	-0.682	3.64					
38	20.5	!	0.248	-0.682	3.64					
39	22		0.266	-0.624	3.66					
40	23		0.278	-0.587	3.69					
42	24		0.291	-0.551	3.74					
43.5	25		0.303	-0.516	3.77					
44.3	26		0.315	-0.481	3.79					
49.3	27		0.328	-0.446	3.90					
52	28		0.340	-0.412	3.95					
54	29		0.352	-0.379	3.99					
55	31.5		0.383	-0.297	4.01					
55	31.5	!	0.383	-0.297	4.01					
55	31.5	!	0.383	-0.297	4.01					
55	31.5	!	0.383	-0.297	4.01					
58	34		0.414	-0.218	4.06					
62	35.5		0.432	-0.171	4.13					
62	35.5	!	0.432	-0.171	4.13					
63.2	37		0.451	-0.124	4.15					
65	38		0.463	-0.093	4.17					
66	39		0.475	-0.062	4.19					
67	40		0.488	-0.031	4.20					
68	41		0.500	0.000	4.22					
71	42		0.512	0.031	4.26					
84	43		0.525	0.062	4.43					
89	44.5		0.543	0.108	4.49					
89	44.5	!	0.543	0.108	4.49					
93	46.5		0.568	0.171	4.53					
93	46.5	!	0.568	0.171	4.53					
99	48		0.586	0.218	4.60					
99.5	49		0.598	0.249	4.60					
100	50		0.611	0.281	4.61					
110	51		0.623	0.314	4.70					
124	52		0.635	0.346	4.82					
130	53		0.648	0.379	4.87					
133	54		0.660	0.412	4.89					
150	55.5		0.678	0.463	5.01					
150	55.5	!	0.678	0.463	5.01					
160	57		0.697	0.516	5.08					
166	58		0.709	0.551	5.11					
167	59		0.722	0.587	5.12					
170	60		0.734	0.624	5.14					
175	61		0.746	0.662	5.16					
181	62		0.758	0.701	5.20					
184	63		0.771	0.741	5.21					
190	64		0.783	0.783	5.25					
195	65		0.795	0.825	5.27					
200	66		0.808	0.869	5.30					
203	67		0.820	0.915	5.31					
227	68		0.832	0.963	5.42					
230	69		0.845	1.014	5.44					
256	70		0.857	1.067	5.55					

Table A-1.15
Statistical Analysis for Zinc in Soil Tundra
Northeast Cape, St. Lawrence Island, Alaska

	$[Zn]_i$	i	ties	quantile	z-score	$ln[Zn]_i$	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
	277.5	71		0.869	1.123	5.63					
	294	72		0.882	1.183	5.68					
	351.5	73		0.894	1.247	5.86					
	430	74		0.906	1.317	6.06					
	440	75		0.918	1.395	6.09					
	444	76		0.931	1.482	6.10					
	470	77		0.943	1.581	6.15					
	540	78		0.955	1.699	6.29					
	554	79		0.968	1.848	6.32					
	665.5	80		0.980	2.054	6.50					
	776	81		0.992	2.423	6.65	2.20	3.31	no	2.2717	2.09E+00
n	81										
max	776										
min	9.0										
stdev	157					1.0					
mean	139					4.4					
CV	1.1										
Normal r^2	0.73										
Lognormal r^2	0.99										
$k_{0.95;0.95,n}$	2.0					2.0					
Normal BUTL	448										
Lognormal BUTL						615					

Note:
Visual inspection of the data resulted in the elimination of values greater than 776 mg/kg.

Table A-2.1
Statistical Analysis for Arsenic in Soil - Gravel
Northeast Cape, St. Lawrence Island, Alaska

	$[As]_i$	i	ties	quantile	z-score	$ln[As]_i$	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
	1.6	1		0.027	-1.929	0.47	2.69	2.78	no	3.3116	7.63E-02
	2.5	2		0.070	-1.477	0.92					
	3.25	3		0.113	-1.211	1.18					
	3.4	4		0.156	-1.011	1.22					
	3.5	5		0.199	-0.845	1.25					
	3.6	6		0.242	-0.700	1.28					
	3.9	7		0.285	-0.568	1.36					
	4.2	8.5		0.349	-0.387	1.44					
	4.2	8.5	!	0.349	-0.387	1.44					
	4.3	10		0.414	-0.217	1.46					
	4.4	11.5		0.478	-0.054	1.48					
	4.4	11.5	!	0.478	-0.054	1.48					
	4.5	13		0.543	0.108	1.50					
	4.6	14		0.586	0.217	1.53					
	4.7	15		0.629	0.329	1.55					
	4.75	16		0.672	0.446	1.56					
	5	17		0.715	0.568	1.61					
	5.1	18		0.758	0.700	1.63					
	5.6	19		0.801	0.845	1.72					
	5.7	20		0.844	1.011	1.74					
	6	21		0.887	1.211	1.79					
	7	22		0.930	1.477	1.95					
	12	23		0.973	1.929	2.48	2.67	2.78	no	3.2881	8.06E-02
n	23										
max	12										
min	1.6										
stdev	2.0					0.38					
mean	4.7					1.5					
CV	0.42										
Normal r2	0.76										
Lognormal r2	0.90										
k0.95;0.95,n	2.3					2.3					
Normal BUTL	9.3										
Lognormal BUTL						11					

Table A-2.2
Statistical Analysis for Cadmium in Soil - Gravel
Northeast Cape, St. Lawrence Island, Alaska

$[Cd]_i$	i	ties	quantile	z-score	$ln[Cd]_i$	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
0.29	1		0.010	-2.319	-1.24	2.69	3.20	no	2.8759	3.41E-01
0.31	2		0.027	-1.934	-1.17					
0.35	3		0.043	-1.718	-1.05					
0.5	4		0.059	-1.562	-0.69					
1	22		0.353	-0.377	0.00					
1	22	!	0.353	-0.377	0.00					
1	22	!	0.353	-0.377	0.00					
1	22	!	0.353	-0.377	0.00					
1	22	!	0.353	-0.377	0.00					
1	22	!	0.353	-0.377	0.00					
1	22	!	0.353	-0.377	0.00					
1	22	!	0.353	-0.377	0.00					
1	22	!	0.353	-0.377	0.00					
1	22	!	0.353	-0.377	0.00					
1	22	!	0.353	-0.377	0.00					
1	22	!	0.353	-0.377	0.00					
1	22	!	0.353	-0.377	0.00					
1	22	!	0.353	-0.377	0.00					
1	22	!	0.353	-0.377	0.00					
1	22	!	0.353	-0.377	0.00					
1	22	!	0.353	-0.377	0.00					
1	22	!	0.353	-0.377	0.00					
1	22	!	0.353	-0.377	0.00					
1	22	!	0.353	-0.377	0.00					
1	22	!	0.353	-0.377	0.00					
1	22	!	0.353	-0.377	0.00					
1	22	!	0.353	-0.377	0.00					
1	22	!	0.353	-0.377	0.00					
1	22	!	0.353	-0.377	0.00					
1	22	!	0.353	-0.377	0.00					
1	22	!	0.353	-0.377	0.00					
1	22	!	0.353	-0.377	0.00					
1	22	!	0.353	-0.377	0.00					
1	22	!	0.353	-0.377	0.00					
1	22	!	0.353	-0.377	0.00					
1	22	!	0.353	-0.377	0.00					
1	22	!	0.353	-0.377	0.00					
1	22	!	0.353	-0.377	0.00					
1	22	!	0.353	-0.377	0.00					
1	22	!	0.353	-0.377	0.00					
1.15	40		0.647	0.377	0.14					
1.3	41		0.663	0.421	0.26					
1.4	42		0.680	0.467	0.34					
1.5	43		0.696	0.513	0.41					
1.525	44		0.712	0.560	0.42					
1.6	45		0.729	0.608	0.47					
1.65	46		0.745	0.659	0.50					
1.7	47		0.761	0.710	0.53					
1.8	48		0.778	0.764	0.59					
1.95	49		0.794	0.820	0.67					
2	51.5		0.835	0.973	0.69					
2	51.5	!	0.835	0.973	0.69					
2	51.5	!	0.835	0.973	0.69					
2	51.5	!	0.835	0.973	0.69					
2.1	54		0.876	1.153	0.74					

Table A-2.2
Statistical Analysis for Cadmium in Soil - Gravel
Northeast Cape, St. Lawrence Island, Alaska

$[Cd]_i$	i	ties	quantile	z-score	$ln[Cd]_i$	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
2.3	55		0.892	1.236	0.83					
2.4	56		0.908	1.330	0.88					
2.6	57		0.924	1.436	0.96					
2.9	58		0.941	1.562	1.06					
3.2	59.5		0.965	1.816	1.16					
3.2	59.5	!	0.965	1.816	1.16					
7.2	61		0.990	2.319	1.97	3.36	3.20	yes	3.7317	2.62E-02

n	61	
max	7.2	
min	0.29	
stdev	0.99	0.53
mean	1.4	0.19
CV	0.70	
Normal r2	0.69	
Lognormal r2	0.97	
k0.95;0.95,n	2.0	2.0
Normal BUTL	3.4	
Lognormal BUTL		3.5

Analysis with outliers removed (1)

$[Cd]_i$	i	ties	quantile	z-score	$ln[Cd]_i$	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
0.29	1		0.010	-2.313	-1.24	2.91	3.20	no	3.1459	1.57E-01
0.31	2		0.027	-1.927	-1.17					
0.35	3		0.044	-1.711	-1.05					
0.5	4		0.060	-1.553	-0.69					
1	22		0.359	-0.361	0.00					
1	22	!	0.359	-0.361	0.00					
1	22	!	0.359	-0.361	0.00					
1	22	!	0.359	-0.361	0.00					
1	22	!	0.359	-0.361	0.00					
1	22	!	0.359	-0.361	0.00					
1	22	!	0.359	-0.361	0.00					
1	22	!	0.359	-0.361	0.00					
1	22	!	0.359	-0.361	0.00					
1	22	!	0.359	-0.361	0.00					
1	22	!	0.359	-0.361	0.00					
1	22	!	0.359	-0.361	0.00					
1	22	!	0.359	-0.361	0.00					
1	22	!	0.359	-0.361	0.00					
1	22	!	0.359	-0.361	0.00					
1	22	!	0.359	-0.361	0.00					
1	22	!	0.359	-0.361	0.00					
1	22	!	0.359	-0.361	0.00					
1	22	!	0.359	-0.361	0.00					
1	22	!	0.359	-0.361	0.00					
1	22	!	0.359	-0.361	0.00					
1	22	!	0.359	-0.361	0.00					
1	22	!	0.359	-0.361	0.00					
1	22	!	0.359	-0.361	0.00					
1	22	!	0.359	-0.361	0.00					
1	22	!	0.359	-0.361	0.00					
1	22	!	0.359	-0.361	0.00					

Table A-2.2
Statistical Analysis for Cadmium in Soil - Gravel
Northeast Cape, St. Lawrence Island, Alaska

	$[Cd]_i$	i	ties	quantile	z-score	$\ln[Cd]_i$	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
	1	22	!	0.359	-0.361	0.00					
	1	22	!	0.359	-0.361	0.00					
	1	22	!	0.359	-0.361	0.00					
	1	22	!	0.359	-0.361	0.00					
	1	22	!	0.359	-0.361	0.00					
	1	22	!	0.359	-0.361	0.00					
	1	22	!	0.359	-0.361	0.00					
	1	22	!	0.359	-0.361	0.00					
	1	22	!	0.359	-0.361	0.00					
	1	22	!	0.359	-0.361	0.00					
	1	22	!	0.359	-0.361	0.00					
	1.15	40		0.658	0.406	0.14					
	1.3	41		0.674	0.452	0.26					
	1.4	42		0.691	0.498	0.34					
	1.5	43		0.707	0.546	0.41					
	1.525	44		0.724	0.595	0.42					
	1.6	45		0.741	0.645	0.47					
	1.65	46		0.757	0.698	0.50					
	1.7	47		0.774	0.752	0.53					
	1.8	48		0.790	0.808	0.59					
	1.95	49		0.807	0.867	0.67					
	2	51.5		0.849	1.030	0.69					
	2	51.5	!	0.849	1.030	0.69					
	2	51.5	!	0.849	1.030	0.69					
	2	51.5	!	0.849	1.030	0.69					
	2.1	54		0.890	1.227	0.74					
	2.3	55		0.907	1.320	0.83					
	2.4	56		0.923	1.427	0.88					
	2.6	57		0.940	1.553	0.96					
	2.9	58		0.956	1.711	1.06					
	3.2	59.5		0.981	2.082	1.16					
	3.2	59.5	!	0.981	2.082	1.16	2.08	3.20	no	2.1602	2.09E+00
n	60										
max	3.2										
min	0.29										
stdev	0.64					0.48					
mean	1.3					0.16					
CV	0.49										
Normal r2	0.92										
Lognormal r2	0.97										
k0.95;0.95,n	2.0					2.0					
Normal BUTL	2.6										
Lognormal BUTL						3.1					

Table A-2.3
Statistical Analysis for Chromium in Soil - Gravel
Northeast Cape, St. Lawrence Island, Alaska

$[Cr]_i$	i	ties	quantile	z-score	$ln[Cr]_i$	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
1	1		0.006	-2.499	0.00	3.91	3.38	yes	4.2554	4.78E-03
3.73	2		0.016	-2.139	1.32					
4.38	3		0.026	-1.940	1.48					
4.5	4		0.036	-1.797	1.50					
4.8	5		0.046	-1.684	1.57					
6	6		0.056	-1.588	1.79					
6.4	7		0.066	-1.506	1.86					
6.5	8		0.076	-1.432	1.87					
6.7	9		0.086	-1.366	1.90					
7.04	10		0.096	-1.305	1.95					
7.3	11		0.106	-1.248	1.99					
7.685	12		0.116	-1.195	2.04					
7.87	13		0.126	-1.146	2.06					
7.88	14		0.136	-1.099	2.06					
8	15		0.146	-1.054	2.08					
8.3	16.5		0.161	-0.991	2.12					
8.3	16.5	!	0.161	-0.991	2.12					
8.34	18		0.176	-0.931	2.12					
8.4	19.5		0.191	-0.875	2.13					
8.4	19.5	!	0.191	-0.875	2.13					
8.9	21		0.206	-0.821	2.19					
9.1	22		0.216	-0.787	2.21					
9.555	23		0.226	-0.753	2.26					
9.62	24		0.236	-0.720	2.26					
9.63	25		0.246	-0.688	2.26					
9.8	26		0.256	-0.657	2.28					
10	27.5		0.271	-0.611	2.30					
10	27.5	!	0.271	-0.611	2.30					
11.6	29		0.286	-0.566	2.45					
11.95	30		0.296	-0.537	2.48					
12	33		0.325	-0.453	2.48					
12	33	!	0.325	-0.453	2.48					
12	33	!	0.325	-0.453	2.48					
12	33	!	0.325	-0.453	2.48					
12	33	!	0.325	-0.453	2.48					
12.4	36		0.355	-0.371	2.52					
12.5	37.5		0.370	-0.331	2.53					
12.5	37.5	!	0.370	-0.331	2.53					
12.8	39		0.385	-0.292	2.55					
13	40.5		0.400	-0.253	2.56					
13	40.5	!	0.400	-0.253	2.56					
13.17	42		0.415	-0.214	2.58					
13.8	43		0.425	-0.189	2.62					
14	45		0.445	-0.138	2.64					

Table A-2.3
Statistical Analysis for Chromium in Soil - Gravel
Northeast Cape, St. Lawrence Island, Alaska

$[Cr]_i$	i	ties	quantile	z-score	$ln[Cr]_i$	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
14	45	!	0.445	-0.138	2.64					
14	45	!	0.445	-0.138	2.64					
14.3	47		0.465	-0.088	2.66					
15	48.5		0.480	-0.050	2.71					
15	48.5	!	0.480	-0.050	2.71					
15.6	50		0.495	-0.013	2.75					
16	52.5		0.520	0.050	2.77					
16	52.5	!	0.520	0.050	2.77					
16	52.5	!	0.520	0.050	2.77					
16	52.5	!	0.520	0.050	2.77					
16.1	55		0.545	0.113	2.78					
16.5	56		0.555	0.138	2.80					
17	58.5		0.580	0.201	2.83					
17	58.5	!	0.580	0.201	2.83					
17	58.5	!	0.580	0.201	2.83					
17	58.5	!	0.580	0.201	2.83					
17.3	61		0.605	0.266	2.85					
17.5	62		0.615	0.292	2.86					
18	64.5		0.640	0.358	2.89					
18	64.5	!	0.640	0.358	2.89					
18	64.5	!	0.640	0.358	2.89					
18	64.5	!	0.640	0.358	2.89					
18.2	67		0.665	0.425	2.90					
19	69		0.685	0.480	2.94					
19	69	!	0.685	0.480	2.94					
19	69	!	0.685	0.480	2.94					
21	71.5		0.709	0.552	3.04					
21	71.5	!	0.709	0.552	3.04					
22	73.5		0.729	0.611	3.09					
22	73.5	!	0.729	0.611	3.09					
22.3	75		0.744	0.657	3.10					
22.7	76		0.754	0.688	3.12					
22.8	77		0.764	0.720	3.13					
23	79.5		0.789	0.804	3.14					
23	79.5	!	0.789	0.804	3.14					
23	79.5	!	0.789	0.804	3.14					
23	79.5	!	0.789	0.804	3.14					
23.4	82		0.814	0.894	3.15					
23.7	83		0.824	0.931	3.17					
24.5	84		0.834	0.971	3.20					
25	85.5		0.849	1.033	3.22					
25	85.5	!	0.849	1.033	3.22					
25.5	87		0.864	1.099	3.24					
26	88		0.874	1.146	3.26					
27	89		0.884	1.195	3.30					
38	90		0.894	1.248	3.64					
40	91		0.904	1.305	3.69					
41	92		0.914	1.366	3.71					
42	93		0.924	1.432	3.74					
42.3	94		0.934	1.506	3.74					
49	95		0.944	1.588	3.89					
52.1	96		0.954	1.684	3.95					
59	97		0.964	1.797	4.08					

Table A-2.3
Statistical Analysis for Chromium in Soil - Gravel
Northeast Cape, St. Lawrence Island, Alaska

	$[Cr]_i$	i	ties	quantile	z-score	$ln[Cr]_i$	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
	65	98		0.974	1.940	4.17					
	90	99		0.984	2.139	4.50					
	147	100		0.994	2.499	4.99	3.27	3.38	no	3.4647	7.89E-02
n	100										
max	147										
min	1.0										
stdev	19					0.70					
mean	20					2.7					
CV	0.96										
Normal r2	0.59										
Lognormal r2	0.95										
k0.95;0.95,n	1.9					1.9					
Normal BUTL	56										
Lognormal BUTL						58					

Analysis with outliers removed (1)

$[Cr]_i$	i	ties	quantile	z-score	$ln[Cr]_i$	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
3.73	1		0.006	-2.495	1.32	2.23	3.35	no	2.2846	2.43E+00
4.38	2		0.016	-2.135	1.48					
4.5	3		0.026	-1.936	1.50					
4.8	4		0.037	-1.793	1.57					
6	5		0.047	-1.679	1.79					
6.4	6		0.057	-1.583	1.86					
6.5	7		0.067	-1.500	1.87					
6.7	8		0.077	-1.427	1.90					
7.04	9		0.087	-1.360	1.95					
7.3	10		0.097	-1.299	1.99					
7.685	11		0.107	-1.242	2.04					
7.87	12		0.117	-1.189	2.06					
7.88	13		0.127	-1.140	2.06					
8	14		0.137	-1.093	2.08					
8.3	15.5		0.152	-1.026	2.12					
8.3	15.5	!	0.152	-1.026	2.12					
8.34	17		0.168	-0.964	2.12					
8.4	18.5		0.183	-0.905	2.13					
8.4	18.5	!	0.183	-0.905	2.13					
8.9	20		0.198	-0.850	2.19					
9.1	21		0.208	-0.814	2.21					
9.555	22		0.218	-0.779	2.26					
9.62	23		0.228	-0.746	2.26					
9.63	24		0.238	-0.713	2.26					
9.8	25		0.248	-0.680	2.28					
10	26.5		0.263	-0.633	2.30					
10	26.5	!	0.263	-0.633	2.30					
11.6	28		0.278	-0.588	2.45					
11.95	29		0.288	-0.558	2.48					
12	32		0.319	-0.472	2.48					
12	32	!	0.319	-0.472	2.48					

Table A-2.3
Statistical Analysis for Chromium in Soil - Gravel
Northeast Cape, St. Lawrence Island, Alaska

$[Cr]_i$	i	ties	quantile	z-score	$ln[Cr]_i$	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
12	32	!	0.319	-0.472	2.48					
12	32	!	0.319	-0.472	2.48					
12	32	!	0.319	-0.472	2.48					
12.4	35		0.349	-0.388	2.52					
12.5	36.5		0.364	-0.348	2.53					
12.5	36.5	!	0.364	-0.348	2.53					
12.8	38		0.379	-0.308	2.55					
13	39.5		0.394	-0.268	2.56					
13	39.5	!	0.394	-0.268	2.56					
13.17	41		0.409	-0.229	2.58					
13.8	42		0.419	-0.203	2.62					
14	44		0.440	-0.152	2.64					
14	44	!	0.440	-0.152	2.64					
14	44	!	0.440	-0.152	2.64					
14.3	46		0.460	-0.101	2.66					
15	47.5		0.475	-0.063	2.71					
15	47.5	!	0.475	-0.063	2.71					
15.6	49		0.490	-0.025	2.75					
16	51.5		0.515	0.038	2.77					
16	51.5	!	0.515	0.038	2.77					
16	51.5	!	0.515	0.038	2.77					
16	51.5	!	0.515	0.038	2.77					
16.1	54		0.540	0.101	2.78					
16.5	55		0.550	0.127	2.80					
17	57.5		0.576	0.191	2.83					
17	57.5	!	0.576	0.191	2.83					
17	57.5	!	0.576	0.191	2.83					
17	57.5	!	0.576	0.191	2.83					
17.3	60		0.601	0.255	2.85					
17.5	61		0.611	0.281	2.86					
18	63.5		0.636	0.348	2.89					
18	63.5	!	0.636	0.348	2.89					
18	63.5	!	0.636	0.348	2.89					
18	63.5	!	0.636	0.348	2.89					
18.2	66		0.661	0.416	2.90					
19	68		0.681	0.472	2.94					
19	68	!	0.681	0.472	2.94					
19	68	!	0.681	0.472	2.94					
21	70.5		0.707	0.543	3.04					
21	70.5	!	0.707	0.543	3.04					
22	72.5		0.727	0.603	3.09					
22	72.5	!	0.727	0.603	3.09					
22.3	74		0.742	0.649	3.10					
22.7	75		0.752	0.680	3.12					
22.8	76		0.762	0.713	3.13					
23	78.5		0.787	0.797	3.14					
23	78.5	!	0.787	0.797	3.14					
23	78.5	!	0.787	0.797	3.14					
23	78.5	!	0.787	0.797	3.14					
23.4	81		0.812	0.887	3.15					
23.7	82		0.822	0.925	3.17					
24.5	83		0.832	0.964	3.20					
25	84.5		0.848	1.026	3.22					

Table A-2.3
Statistical Analysis for Chromium in Soil - Gravel
Northeast Cape, St. Lawrence Island, Alaska

$[Cr]_i$	i	ties	quantile	z-score	$ln[Cr]_i$	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
25	84.5	!	0.848	1.026	3.22					
25.5	86		0.863	1.093	3.24					
26	87		0.873	1.140	3.26					
27	88		0.883	1.189	3.30					
38	89		0.893	1.242	3.64					
40	90		0.903	1.299	3.69					
41	91		0.913	1.360	3.71					
42	92		0.923	1.427	3.74					
42.3	93		0.933	1.500	3.74					
49	94		0.943	1.583	3.89					
52.1	95		0.953	1.679	3.95					
59	96		0.963	1.793	4.08					
65	97		0.974	1.936	4.17					
90	98		0.984	2.135	4.50					
147	99		0.994	2.495	4.99	3.50	3.35	yes	3.7429	3.05E-02

n	99		
max	147		
min	3.7		
stdev	19	0.64	
mean	20	2.7	
CV	0.95		
Normal r2	0.59		
Lognormal r2	0.97		
k0.95;0.95,n	2.0	2.0	
Normal BUTL	57		
Lognormal BUTL		55	

Analysis with outliers removed (2)

$[Cr]_i$	i	ties	quantile	z-score	$ln[Cr]_i$	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
3.73	1		0.006	-2.491	1.32	2.33	3.35	no	2.3995	1.80E+00
4.38	2		0.017	-2.131	1.48					
4.5	3		0.027	-1.931	1.50					
4.8	4		0.037	-1.788	1.57					
6	5		0.047	-1.674	1.79					
6.4	6		0.057	-1.578	1.86					
6.5	7		0.067	-1.495	1.87					
6.7	8		0.078	-1.421	1.90					
7.04	9		0.088	-1.355	1.95					
7.3	10		0.098	-1.293	1.99					
7.685	11		0.108	-1.236	2.04					
7.87	12		0.118	-1.183	2.06					
7.88	13		0.128	-1.134	2.06					
8	14		0.139	-1.086	2.08					
8.3	15.5		0.154	-1.020	2.12					
8.3	15.5	!	0.154	-1.020	2.12					
8.34	17		0.169	-0.957	2.12					
8.4	18.5		0.184	-0.898	2.13					
8.4	18.5	!	0.184	-0.898	2.13					

Table A-2.3
Statistical Analysis for Chromium in Soil - Gravel
Northeast Cape, St. Lawrence Island, Alaska

$[Cr]_i$	i	ties	quantile	z-score	$ln[Cr]_i$	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
8.9	20		0.200	-0.843	2.19					
9.1	21		0.210	-0.807	2.21					
9.555	22		0.220	-0.772	2.26					
9.62	23		0.230	-0.738	2.26					
9.63	24		0.240	-0.705	2.26					
9.8	25		0.251	-0.672	2.28					
10	26.5		0.266	-0.625	2.30					
10	26.5	!	0.266	-0.625	2.30					
11.6	28		0.281	-0.579	2.45					
11.95	29		0.291	-0.549	2.48					
12	32		0.322	-0.462	2.48					
12	32	!	0.322	-0.462	2.48					
12	32	!	0.322	-0.462	2.48					
12	32	!	0.322	-0.462	2.48					
12	32	!	0.322	-0.462	2.48					
12.4	35		0.352	-0.379	2.52					
12.5	36.5		0.368	-0.338	2.53					
12.5	36.5	!	0.368	-0.338	2.53					
12.8	38		0.383	-0.298	2.55					
13	39.5		0.398	-0.258	2.56					
13	39.5	!	0.398	-0.258	2.56					
13.17	41		0.413	-0.219	2.58					
13.8	42		0.424	-0.193	2.62					
14	44		0.444	-0.141	2.64					
14	44	!	0.444	-0.141	2.64					
14	44	!	0.444	-0.141	2.64					
14.3	46		0.464	-0.089	2.66					
15	47.5		0.480	-0.051	2.71					
15	47.5	!	0.480	-0.051	2.71					
15.6	49		0.495	-0.013	2.75					
16	51.5		0.520	0.051	2.77					
16	51.5	!	0.520	0.051	2.77					
16	51.5	!	0.520	0.051	2.77					
16	51.5	!	0.520	0.051	2.77					
16.1	54		0.546	0.115	2.78					
16.5	55		0.556	0.141	2.80					
17	57.5		0.581	0.206	2.83					
17	57.5	!	0.581	0.206	2.83					
17	57.5	!	0.581	0.206	2.83					
17	57.5	!	0.581	0.206	2.83					
17.3	60		0.607	0.271	2.85					
17.5	61		0.617	0.298	2.86					
18	63.5		0.642	0.365	2.89					
18	63.5	!	0.642	0.365	2.89					
18	63.5	!	0.642	0.365	2.89					
18	63.5	!	0.642	0.365	2.89					
18.2	66		0.668	0.434	2.90					
19	68		0.688	0.491	2.94					
19	68	!	0.688	0.491	2.94					
19	68	!	0.688	0.491	2.94					
21	70.5		0.714	0.564	3.04					
21	70.5	!	0.714	0.564	3.04					
22	72.5		0.734	0.625	3.09					

Table A-2.3
Statistical Analysis for Chromium in Soil - Gravel
Northeast Cape, St. Lawrence Island, Alaska

$[Cr]_i$	i	ties	quantile	z-score	$ln[Cr]_i$	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
22	72.5	!	0.734	0.625	3.09					
22.3	74		0.749	0.672	3.10					
22.7	75		0.760	0.705	3.12					
22.8	76		0.770	0.738	3.13					
23	78.5		0.795	0.824	3.14					
23	78.5	!	0.795	0.824	3.14					
23	78.5	!	0.795	0.824	3.14					
23	78.5	!	0.795	0.824	3.14					
23.4	81		0.821	0.918	3.15					
23.7	82		0.831	0.957	3.17					
24.5	83		0.841	0.998	3.20					
25	84.5		0.856	1.064	3.22					
25	84.5	!	0.856	1.064	3.22					
25.5	86		0.872	1.134	3.24					
26	87		0.882	1.183	3.26					
27	88		0.892	1.236	3.30					
38	89		0.902	1.293	3.64					
40	90		0.912	1.355	3.69					
41	91		0.922	1.421	3.71					
42	92		0.933	1.495	3.74					
42.3	93		0.943	1.578	3.74					
49	94		0.953	1.674	3.89					
52.1	95		0.963	1.788	3.95					
59	96		0.973	1.931	4.08					
65	97		0.983	2.131	4.17					
90	98		0.994	2.491	4.50	2.95	3.35	no	3.0914	2.56E-01

n	98	
max	90	
min	3.7	
stdev	14	0.60
mean	18	2.7
CV	0.74	
Normal r2	0.74	
Lognormal r2	0.98	
k0.95;0.95,n	2.0	2.0
Normal BUTL	45	
Lognormal BUTL		50

Table A-2.4
Statistical Analysis for Copper in Soil - Gravel
Northeast Cape, St. Lawrence Island, Alaska

[Cu]i	i	ties	quantile	z-score	ln[Cu]i	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
6.1	1		0.010	-2.319	1.81	2.06	3.20	no	2.1330	2.26E+00
7.4	2		0.027	-1.934	2.00					
7.95	3		0.043	-1.718	2.07					
8.4	4		0.059	-1.562	2.13					
8.6	5		0.076	-1.436	2.15					
8.75	6		0.092	-1.330	2.17					
8.8	7.5		0.116	-1.194	2.17					
8.8	7.5	!	0.116	-1.194	2.17					
9	9		0.141	-1.077	2.20					
10	11		0.173	-0.941	2.30					
10	11	!	0.173	-0.941	2.30					
10	11	!	0.173	-0.941	2.30					
11	14		0.222	-0.764	2.40					
11	14	!	0.222	-0.764	2.40					
11	14	!	0.222	-0.764	2.40					
12	17.5		0.280	-0.584	2.48					
12	17.5	!	0.280	-0.584	2.48					
12	17.5	!	0.280	-0.584	2.48					
12	17.5	!	0.280	-0.584	2.48					
13	20.5		0.329	-0.444	2.56					
13	20.5	!	0.329	-0.444	2.56					
14	23		0.369	-0.333	2.64					
14	23	!	0.369	-0.333	2.64					
14	23	!	0.369	-0.333	2.64					
15	25.5		0.410	-0.227	2.71					
15	25.5	!	0.410	-0.227	2.71					
16	28.5		0.459	-0.102	2.77					
16	28.5	!	0.459	-0.102	2.77					
16	28.5	!	0.459	-0.102	2.77					
16	28.5	!	0.459	-0.102	2.77					
16.5	31		0.500	0.000	2.80					
17	34.5		0.557	0.144	2.83					
17	34.5	!	0.557	0.144	2.83					
17	34.5	!	0.557	0.144	2.83					
17	34.5	!	0.557	0.144	2.83					
17	34.5	!	0.557	0.144	2.83					
17	34.5	!	0.557	0.144	2.83					
18	39.5		0.639	0.355	2.89					
18	39.5	!	0.639	0.355	2.89					
18	39.5	!	0.639	0.355	2.89					
18	39.5	!	0.639	0.355	2.89					
20	42		0.680	0.467	3.00					
21	43		0.696	0.513	3.04					
22	44.5		0.720	0.584	3.09					
22	44.5	!	0.720	0.584	3.09					
23	46		0.745	0.659	3.14					
24	47.5		0.769	0.737	3.18					
24	47.5	!	0.769	0.737	3.18					
25	49		0.794	0.820	3.22					
26	51		0.827	0.941	3.26					
26	51	!	0.827	0.941	3.26					
26	51	!	0.827	0.941	3.26					
27	53.5		0.867	1.114	3.30					
27	53.5	!	0.867	1.114	3.30					

Table A-2.4
Statistical Analysis for Copper in Soil - Gravel
Northeast Cape, St. Lawrence Island, Alaska

[Cu]i	i	ties	quantile	z-score	ln[Cu]i	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
31	55		0.892	1.236	3.43					
34	56		0.908	1.330	3.53					
35	57		0.924	1.436	3.56					
36	58		0.941	1.562	3.58					
38	59		0.957	1.718	3.64					
41.3	60		0.973	1.934	3.72					
65	61		0.990	2.319	4.17	2.85	3.20	no	3.0702	1.97E-01

n	61		
max	65		
min	6.10		
stdev	10	0.48	
mean	19	2.8	
CV	0.55		
Normal r2	0.83		
Lognormal r2	0.99		
k0.95;0.95,n	2.0	2.0	
Normal BUTL	39		
Lognormal BUTL		44	

Table A-2.5
Statistical Analysis for Lead in Soil - Gravel
Northeast Cape, St. Lawrence Island, Alaska

[Pb]i	i	ties	quantile	z-score	ln[Pb]i	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
7.1	1		0.006	-2.509	1.96	1.57	3.38	no	1.5939	1.17E+01
8	2		0.016	-2.151	2.08					
8.4	3		0.025	-1.953	2.13					
8.45	4		0.035	-1.811	2.13					
8.5	5		0.045	-1.698	2.14					
8.8	6		0.054	-1.603	2.17					
9.2	7		0.064	-1.521	2.22					
9.91	8		0.074	-1.448	2.29					
11	9		0.084	-1.382	2.40					
11.6	10		0.093	-1.321	2.45					
12	11		0.103	-1.265	2.48					
12.4	12.5		0.117	-1.188	2.52					
12.4	12.5	!	0.117	-1.188	2.52					
13.1	14		0.132	-1.117	2.57					
13.4	15		0.142	-1.073	2.60					
13.5	16		0.151	-1.031	2.60					
13.9	17		0.161	-0.990	2.63					
14	19.5		0.185	-0.896	2.64					
14	19.5	!	0.185	-0.896	2.64					
14	19.5	!	0.185	-0.896	2.64					
14	19.5	!	0.185	-0.896	2.64					
14.4	22		0.209	-0.808	2.67					
14.7	23		0.219	-0.775	2.69					
14.9	24		0.229	-0.743	2.70					
15.1	25		0.238	-0.711	2.71					
15.15	26		0.248	-0.680	2.72					
15.5	27		0.258	-0.650	2.74					
16	28		0.268	-0.620	2.77					
16.85	29		0.277	-0.591	2.82					
17	30		0.287	-0.562	2.83					
17.3	31		0.297	-0.534	2.85					
17.6	32		0.306	-0.506	2.87					
17.8	33		0.316	-0.479	2.88					
18	34.5		0.331	-0.439	2.89					
18	34.5	!	0.331	-0.439	2.89					
18.4	36		0.345	-0.399	2.91					
19.2	37		0.355	-0.373	2.95					
19.3	38		0.364	-0.347	2.96					
21.4	39		0.374	-0.321	3.06					
21.8	40		0.384	-0.296	3.08					
22	41.5		0.398	-0.258	3.09					
22	41.5	!	0.398	-0.258	3.09					
22.5	43		0.413	-0.220	3.11					
24	44.5		0.427	-0.183	3.18					
24	44.5	!	0.427	-0.183	3.18					
24.4	46		0.442	-0.146	3.19					
25	47		0.452	-0.122	3.22					
26	48		0.461	-0.097	3.26					
27	49		0.471	-0.073	3.30					
27.5	50		0.481	-0.049	3.31					
28	52		0.500	0.000	3.33					
28	52	!	0.500	0.000	3.33					

Table A-2.5
Statistical Analysis for Lead in Soil - Gravel
Northeast Cape, St. Lawrence Island, Alaska

[Pb]i	i	ties	quantile	z-score	ln[Pb]i	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
28	52	!	0.500	0.000	3.33					
29.6	54		0.519	0.049	3.39					
30	55.5		0.534	0.085	3.40					
30	55.5	!	0.534	0.085	3.40					
31	57.5		0.553	0.134	3.43					
31	57.5	!	0.553	0.134	3.43					
31.3	59		0.568	0.171	3.44					
32.1	60		0.577	0.195	3.47					
32.2	61		0.587	0.220	3.47					
35.5	62		0.597	0.245	3.57					
37.7	63		0.607	0.270	3.63					
39	64		0.616	0.296	3.66					
40	65		0.626	0.321	3.69					
41.3	66		0.636	0.347	3.72					
42	67		0.645	0.373	3.74					
42.4	68		0.655	0.399	3.75					
43.65	69		0.665	0.425	3.78					
43.7	70		0.674	0.452	3.78					
44	71		0.684	0.479	3.78					
45	72		0.694	0.506	3.81					
50.5	73		0.703	0.534	3.92					
51	74		0.713	0.562	3.93					
52	75		0.723	0.591	3.95					
53	76		0.732	0.620	3.97					
60.5	77		0.742	0.650	4.10					
61	78		0.752	0.680	4.11					
61.9	79		0.762	0.711	4.13					
63	80		0.771	0.743	4.14					
65	81		0.781	0.775	4.17					
67	82		0.791	0.808	4.20					
68	83		0.800	0.842	4.22					
69	84		0.810	0.878	4.23					
71	85		0.820	0.914	4.26					
72	86		0.829	0.951	4.28					
76	87		0.839	0.990	4.33					
84	88		0.849	1.031	4.43					
87	89		0.858	1.073	4.47					
90	90		0.868	1.117	4.50					
98	91		0.878	1.164	4.58					
99	92		0.887	1.213	4.60					
100	93		0.897	1.265	4.61					
119	94		0.907	1.321	4.78					
125	95		0.916	1.382	4.83					
157	96		0.926	1.448	5.06					
204	97		0.936	1.521	5.32					
222.5	98		0.946	1.603	5.40					
224	99		0.955	1.698	5.41					
329	100		0.965	1.811	5.80					
497	101		0.975	1.953	6.21					
586	102		0.984	2.151	6.37					
822	103		0.994	2.509	6.71	3.31	3.38	no	3.5006	7.13E-02

Table A-2.5
Statistical Analysis for Lead in Soil - Gravel
Northeast Cape, St. Lawrence Island, Alaska

	[Pb]i	i	ties	quantile	z-score	ln[Pb]i	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
n	103										
max	822										
min	7.1										
stdev	114					0.97					
mean	62					3.5					
CV	1.8										
Normal r2	0.43										
Lognormal r2	0.94										
k0.95;0.95,n	1.9					1.9					
Normal BUTL	282										
Lognormal BUTL						214					

Table A-2.6
Statistical Analysis for Nickel in Soil - Gravel
Northeast Cape, St. Lawrence Island, Alaska

[Ni]i	i	ties	quantile	z-score	ln[Ni]i	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
2.5	2.5		0.035	-1.816	0.92	2.53	3.20	no	2.6812	5.79E-01
2.5	2.5	!	0.035	-1.816	0.92					
2.5	2.5	!	0.035	-1.816	0.92					
2.5	2.5	!	0.035	-1.816	0.92					
5	5.5		0.084	-1.381	1.61					
5	5.5	!	0.084	-1.381	1.61					
5.1	7		0.108	-1.236	1.63					
6	8		0.124	-1.153	1.79					
6.3	9		0.141	-1.077	1.84					
6.55	10		0.157	-1.006	1.88					
7.2	11		0.173	-0.941	1.97					
7.4	12		0.190	-0.879	2.00					
7.45	13		0.206	-0.820	2.01					
7.8	15		0.239	-0.710	2.05					
7.8	15	!	0.239	-0.710	2.05					
7.8	15	!	0.239	-0.710	2.05					
8	17		0.271	-0.608	2.08					
8.1	18		0.288	-0.560	2.09					
8.2	19		0.304	-0.513	2.10					
8.6	20.5		0.329	-0.444	2.15					
8.6	20.5	!	0.329	-0.444	2.15					
8.8	22		0.353	-0.377	2.17					
8.9	23.5		0.378	-0.312	2.19					
8.9	23.5	!	0.378	-0.312	2.19					
9	25		0.402	-0.248	2.20					
9.4	26		0.418	-0.206	2.24					
10	29.5		0.476	-0.061	2.30					
10	29.5	!	0.476	-0.061	2.30					
10	29.5	!	0.476	-0.061	2.30					
10	29.5	!	0.476	-0.061	2.30					
10	29.5	!	0.476	-0.061	2.30					
10	29.5	!	0.476	-0.061	2.30					
11	34		0.549	0.123	2.40					
11	34	!	0.549	0.123	2.40					
11	34	!	0.549	0.123	2.40					
11.5	36		0.582	0.206	2.44					
12	40		0.647	0.377	2.48					
12	40	!	0.647	0.377	2.48					
12	40	!	0.647	0.377	2.48					
12	40	!	0.647	0.377	2.48					
12	40	!	0.647	0.377	2.48					
12	40	!	0.647	0.377	2.48					
12	40	!	0.647	0.377	2.48					
13	44.5		0.720	0.584	2.56					
13	44.5	!	0.720	0.584	2.56					
13.5	46		0.745	0.659	2.60					
14	47.5		0.769	0.737	2.64					
14	47.5	!	0.769	0.737	2.64					
15.5	49		0.794	0.820	2.74					
16	51		0.827	0.941	2.77					
16	51	!	0.827	0.941	2.77					
16	51	!	0.827	0.941	2.77					

Table A-2.6
Statistical Analysis for Nickel in Soil - Gravel
Northeast Cape, St. Lawrence Island, Alaska

	[Ni]i	i	ties	quantile	z-score	ln[Ni]i	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
	17	53.5		0.867	1.114	2.83					
	17	53.5	!	0.867	1.114	2.83					
	19	55		0.892	1.236	2.94					
	20	56		0.908	1.330	3.00					
	23	57		0.924	1.436	3.14					
	24	58		0.941	1.562	3.18					
	25	59		0.957	1.718	3.22					
	26	60		0.973	1.934	3.26					
	31	61		0.990	2.319	3.43	2.06	3.20	no	2.1436	2.21E+00
n	61										
max	31										
min	2.5										
stdev	5.9					0.55					
mean	11					2.3					
CV	0.51										
Normal r2	0.92										
Lognormal r2	0.95										
k0.95;0.95,n	2.0					2.0					
Normal BUTL	23										
Lognormal BUTL						30					

A-2.7
Statistical Analysis for Thallium in Soil - Gravel
Northeast Cape, St. Lawrence Island, Alaska

[Tl]i	i	ties	quantile	z-score	ln[Tl]i	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
0.06	1		0.010	-2.319	-2.81	2.26	3.20	no	2.3676	1.29E+00
0.19	2		0.027	-1.934	-1.66					
0.26	3.5		0.051	-1.635	-1.35					
0.26	3.5	!	0.051	-1.635	-1.35					
0.29	5		0.076	-1.436	-1.24					
0.3	6		0.092	-1.330	-1.20					
0.34	7		0.108	-1.236	-1.08					
0.36	8		0.124	-1.153	-1.02					
3	9		0.141	-1.077	1.10					
10	33.5		0.541	0.102	2.30					
10	33.5	!	0.541	0.102	2.30					
10	33.5	!	0.541	0.102	2.30					
10	33.5	!	0.541	0.102	2.30					
10	33.5	!	0.541	0.102	2.30					
10	33.5	!	0.541	0.102	2.30					
10	33.5	!	0.541	0.102	2.30					
10	33.5	!	0.541	0.102	2.30					
10	33.5	!	0.541	0.102	2.30					
10	33.5	!	0.541	0.102	2.30					
10	33.5	!	0.541	0.102	2.30					
10	33.5	!	0.541	0.102	2.30					
10	33.5	!	0.541	0.102	2.30					
10	33.5	!	0.541	0.102	2.30					
10	33.5	!	0.541	0.102	2.30					
10	33.5	!	0.541	0.102	2.30					
10	33.5	!	0.541	0.102	2.30					
10	33.5	!	0.541	0.102	2.30					
10	33.5	!	0.541	0.102	2.30					
10	33.5	!	0.541	0.102	2.30					
10	33.5	!	0.541	0.102	2.30					
10	33.5	!	0.541	0.102	2.30					
10	33.5	!	0.541	0.102	2.30					
10	33.5	!	0.541	0.102	2.30					
10	33.5	!	0.541	0.102	2.30					
10	33.5	!	0.541	0.102	2.30					
10	33.5	!	0.541	0.102	2.30					
10	33.5	!	0.541	0.102	2.30					
10	33.5	!	0.541	0.102	2.30					
10	33.5	!	0.541	0.102	2.30					
10	33.5	!	0.541	0.102	2.30					
10	33.5	!	0.541	0.102	2.30					
10	33.5	!	0.541	0.102	2.30					
10	33.5	!	0.541	0.102	2.30					
10	33.5	!	0.541	0.102	2.30					
10	33.5	!	0.541	0.102	2.30					
10	33.5	!	0.541	0.102	2.30					
10	33.5	!	0.541	0.102	2.30					
10	33.5	!	0.541	0.102	2.30					
10	33.5	!	0.541	0.102	2.30					
10	33.5	!	0.541	0.102	2.30					
10	33.5	!	0.541	0.102	2.30					
10	33.5	!	0.541	0.102	2.30					
10	33.5	!	0.541	0.102	2.30					
10	33.5	!	0.541	0.102	2.30					
10	33.5	!	0.541	0.102	2.30					
10	33.5	!	0.541	0.102	2.30					
10	33.5	!	0.541	0.102	2.30					
10	33.5	!	0.541	0.102	2.30					
10	33.5	!	0.541	0.102	2.30					

A-2.7
Statistical Analysis for Thallium in Soil - Gravel
Northeast Cape, St. Lawrence Island, Alaska

	[Tl]i	i	ties	quantile	z-score	ln[Tl]i	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
	10	33.5	!	0.541	0.102	2.30					
	10	33.5	!	0.541	0.102	2.30					
	10	33.5	!	0.541	0.102	2.30					
	10	33.5	!	0.541	0.102	2.30					
	10	33.5	!	0.541	0.102	2.30					
	10	33.5	!	0.541	0.102	2.30					
	11.5	58.5		0.949	1.635	2.44					
	11.5	58.5	!	0.949	1.635	2.44					
	13	60		0.973	1.934	2.56					
	23	61		0.990	2.319	3.14	3.60	3.20	yes	4.0698	8.65E-03
n	61										
max	23										
min	0.060										
stdev	3.9					1.3					
mean	8.9					1.8					
CV	0.44										
Normal r2	0.85										
Lognormal r2	0.72										
k0.95;0.95,n	2.0					2.0					
Normal BUTL	17										
Lognormal BUTL						87					

Analysis with outliers removed (1)

[Tl]i	i	ties	quantile	z-score	ln[Tl]i	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
0.06	1		0.010	-2.313	-2.81	2.47	3.20	no	2.6133	6.84E-01
0.19	2		0.027	-1.927	-1.66					
0.26	3.5		0.052	-1.627	-1.35					
0.26	3.5	!	0.052	-1.627	-1.35					
0.29	5		0.077	-1.427	-1.24					
0.3	6		0.093	-1.320	-1.20					
0.34	7		0.110	-1.227	-1.08					
0.36	8		0.127	-1.143	-1.02					
3	9		0.143	-1.066	1.10					
10	33.5		0.550	0.125	2.30					
10	33.5	!	0.550	0.125	2.30					
10	33.5	!	0.550	0.125	2.30					
10	33.5	!	0.550	0.125	2.30					
10	33.5	!	0.550	0.125	2.30					
10	33.5	!	0.550	0.125	2.30					
10	33.5	!	0.550	0.125	2.30					
10	33.5	!	0.550	0.125	2.30					
10	33.5	!	0.550	0.125	2.30					
10	33.5	!	0.550	0.125	2.30					
10	33.5	!	0.550	0.125	2.30					
10	33.5	!	0.550	0.125	2.30					
10	33.5	!	0.550	0.125	2.30					

A-2.7
Statistical Analysis for Thallium in Soil - Gravel
Northeast Cape, St. Lawrence Island, Alaska

[Tl]i	i	ties	quantile	z-score	ln[Tl]i	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
10	33.5	!	0.550	0.125	2.30					
10	33.5	!	0.550	0.125	2.30					
10	33.5	!	0.550	0.125	2.30					
10	33.5	!	0.550	0.125	2.30					
10	33.5	!	0.550	0.125	2.30					
10	33.5	!	0.550	0.125	2.30					
10	33.5	!	0.550	0.125	2.30					
10	33.5	!	0.550	0.125	2.30					
10	33.5	!	0.550	0.125	2.30					
10	33.5	!	0.550	0.125	2.30					
10	33.5	!	0.550	0.125	2.30					
10	33.5	!	0.550	0.125	2.30					
10	33.5	!	0.550	0.125	2.30					
10	33.5	!	0.550	0.125	2.30					
10	33.5	!	0.550	0.125	2.30					
10	33.5	!	0.550	0.125	2.30					
10	33.5	!	0.550	0.125	2.30					
10	33.5	!	0.550	0.125	2.30					
10	33.5	!	0.550	0.125	2.30					
10	33.5	!	0.550	0.125	2.30					
10	33.5	!	0.550	0.125	2.30					
10	33.5	!	0.550	0.125	2.30					
10	33.5	!	0.550	0.125	2.30					
10	33.5	!	0.550	0.125	2.30					
10	33.5	!	0.550	0.125	2.30					
10	33.5	!	0.550	0.125	2.30					
10	33.5	!	0.550	0.125	2.30					
10	33.5	!	0.550	0.125	2.30					
10	33.5	!	0.550	0.125	2.30					
10	33.5	!	0.550	0.125	2.30					
10	33.5	!	0.550	0.125	2.30					
10	33.5	!	0.550	0.125	2.30					
10	33.5	!	0.550	0.125	2.30					
10	33.5	!	0.550	0.125	2.30					
10	33.5	!	0.550	0.125	2.30					
10	33.5	!	0.550	0.125	2.30					
11.5	58.5		0.965	1.808	2.44					
11.5	58.5	!	0.965	1.808	2.44					
13	60		0.990	2.313	2.56	1.24	3.20	no	1.2536	1.29E+01

n	60		
max	13		
min	0.060		
stdev	3.5	1.3	
mean	8.7	1.8	
CV	0.40		
Normal r2	0.79		
Lognormal r2	0.72		
k0.95;0.95,n	2.0	2.0	

A-2.7
Statistical Analysis for Thallium in Soil - Gravel
Northeast Cape, St. Lawrence Island, Alaska

	[Tl]i	i	ties	quantile	z-score	ln[Tl]i	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
Normal BUTL	16										
Lognormal BUTL						84					

Analysis of Data After Data Elimination Based on Chemical Analysis Method

	[Tl]i	i	ties	quantile	z-score	ln[Tl]i	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
	0.06	1		0.076	-1.434	-2.81	2.07	2.13	no	3.7352	7.74E-02
	0.19	2		0.197	-0.852	-1.66					
	0.26	3.5		0.379	-0.309	-1.35					
	0.26	3.5	!	0.379	-0.309	-1.35					
	0.29	5		0.561	0.153	-1.24					
	0.3	6		0.682	0.473	-1.20					
	0.34	7		0.803	0.852	-1.08					
	0.36	8		0.924	1.434	-1.02	1.07	2.13	no	1.1800	2.26E+00
n	8										
max	0.36										
min	0.060										
stdev	0.095					0.58					
mean	0.26					-1.5					
CV	0.37										
Normal r2	0.88										
Lognormal r2	0.70										
k0.95;0.95,n	3.2					3.2					
Normal BUTL	0.56										
Lognormal BUTL						1.5					

Note:
Thallium results analyzed by the 6010 method were eliminated. Only those results analyzed by the 7841 method are included.

Table A-2.8
Statistical Analysis for Zinc in Soil - Gravel
Northeast Cape, St. Lawrence Island, Alaska

[Zn]i	i	ties	quantile	z-score	ln[Zn]i	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
12	1		0.006	-2.499	2.48	2.05	3.38	no	2.0985	3.84E+00
17.3	2		0.016	-2.139	2.85					
20	3		0.026	-1.940	3.00					
20.1	4		0.036	-1.797	3.00					
22	5		0.046	-1.684	3.09					
23.5	6		0.056	-1.588	3.16					
30	7.5		0.071	-1.468	3.40					
30	7.5	!	0.071	-1.468	3.40					
33.4	9		0.086	-1.366	3.51					
34	10		0.096	-1.305	3.53					
34.1	11		0.106	-1.248	3.53					
35	12.5		0.121	-1.170	3.56					
35	12.5	!	0.121	-1.170	3.56					
35.5	14		0.136	-1.099	3.57					
36	15		0.146	-1.054	3.58					
36.1	16		0.156	-1.012	3.59					
37.9	17		0.166	-0.971	3.63					
38.2	18		0.176	-0.931	3.64					
39	19		0.186	-0.894	3.66					
39.4	20		0.196	-0.857	3.67					
40.7	21		0.206	-0.821	3.71					
41	22.5		0.221	-0.770	3.71					
41	22.5	!	0.221	-0.770	3.71					
42	24		0.236	-0.720	3.74					
42.4	25		0.246	-0.688	3.75					
44	26		0.256	-0.657	3.78					
44.5	27		0.266	-0.626	3.80					
44.7	28		0.276	-0.596	3.80					
45	29.5		0.291	-0.552	3.81					
45	29.5	!	0.291	-0.552	3.81					
45.9	31		0.305	-0.509	3.83					
46.7	32		0.315	-0.480	3.84					
47	34		0.335	-0.425	3.85					
47	34	!	0.335	-0.425	3.85					
47	34	!	0.335	-0.425	3.85					
48.4	36		0.355	-0.371	3.88					
48.5	37		0.365	-0.344	3.88					
49	40		0.395	-0.266	3.89					
49	40	!	0.395	-0.266	3.89					
49	40	!	0.395	-0.266	3.89					
49	40	!	0.395	-0.266	3.89					
49	40	!	0.395	-0.266	3.89					
49.8	43		0.425	-0.189	3.91					
50	44		0.435	-0.163	3.91					
50.8	45		0.445	-0.138	3.93					
53	46		0.455	-0.113	3.97					
53.5	47		0.465	-0.088	3.98					
54	48		0.475	-0.063	3.99					
54.35	49		0.485	-0.038	4.00					
54.5	50		0.495	-0.013	4.00					
55.2	51		0.505	0.013	4.01					
56.2	52		0.515	0.038	4.03					
57.6	53		0.525	0.063	4.05					
59.9	54		0.535	0.088	4.09					
59.95	55		0.545	0.113	4.09					
60.8	56		0.555	0.138	4.11					

Table A-2.8
Statistical Analysis for Zinc in Soil - Gravel
Northeast Cape, St. Lawrence Island, Alaska

[Zn]i	i	ties	quantile	z-score	ln[Zn]i	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
60.9	57		0.565	0.163	4.11					
61	58.5		0.580	0.201	4.11					
61	58.5	!	0.580	0.201	4.11					
61.9	60		0.595	0.240	4.13					
64	61		0.605	0.266	4.16					
65	62		0.615	0.292	4.17					
69.45	63		0.625	0.318	4.24					
70.5	64		0.635	0.344	4.26					
72	65		0.645	0.371	4.28					
73	66.5		0.660	0.411	4.29					
73	66.5	!	0.660	0.411	4.29					
75	68		0.675	0.453	4.32					
75.2	69		0.685	0.480	4.32					
77	70		0.695	0.509	4.34					
77.5	71		0.704	0.537	4.35					
78	72		0.714	0.566	4.36					
82	73		0.724	0.596	4.41					
82.1	74		0.734	0.626	4.41					
84	75		0.744	0.657	4.43					
87.4	76		0.754	0.688	4.47					
89	77		0.764	0.720	4.49					
90.3	78		0.774	0.753	4.50					
92.4	79		0.784	0.787	4.53					
92.6	80		0.794	0.821	4.53					
94	81		0.804	0.857	4.54					
106	82		0.814	0.894	4.66					
108	83		0.824	0.931	4.68					
110	84.5		0.839	0.991	4.70					
110	84.5	!	0.839	0.991	4.70					
112	86		0.854	1.054	4.72					
118	87		0.864	1.099	4.77					
124	88		0.874	1.146	4.82					
127	89		0.884	1.195	4.84					
137	90		0.894	1.248	4.92					
140	91		0.904	1.305	4.94					
152	92		0.914	1.366	5.02					
169	93		0.924	1.432	5.13					
172	94		0.934	1.506	5.15					
183	95		0.944	1.588	5.21					
282	96		0.954	1.684	5.64					
385	97		0.964	1.797	5.95					
442	98		0.974	1.940	6.09					
460	99		0.984	2.139	6.13					
12100	100		0.994	2.499	9.40	6.37	3.38	yes	8.3099	5.51E-11

n	100		
max	12100		
min	12		
stdev	1204	0.82	
mean	198	4.2	
CV	6.1		
Normal r2	0.089		
Lognormal r2	0.77		
k0.95;0.95,n	1.9	1.9	
Normal BUTL	2516		
Lognormal BUTL		315	

Table A-2.8
Statistical Analysis for Zinc in Soil - Gravel
Northeast Cape, St. Lawrence Island, Alaska

[Zn]i	i	ties	quantile	z-score	ln[Zn]i	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
Analysis with outliers removed (1)										
[Zn]i	**i**	**ties**	**quantile**	**z-score**	**ln[Zn]i**	**Grubb's z**	**Critical z**	**Outlier ?**	***T***	**Grubb's p**
12	1		0.006	-2.495	2.48	2.58	3.35	no	2.6769	8.64E-01
17.3	2		0.016	-2.135	2.85					
20	3		0.026	-1.936	3.00					
20.1	4		0.037	-1.793	3.00					
22	5		0.047	-1.679	3.09					
23.5	6		0.057	-1.583	3.16					
30	7.5		0.072	-1.463	3.40					
30	7.5	!	0.072	-1.463	3.40					
33.4	9		0.087	-1.360	3.51					
34	10		0.097	-1.299	3.53					
34.1	11		0.107	-1.242	3.53					
35	12.5		0.122	-1.164	3.56					
35	12.5	!	0.122	-1.164	3.56					
35.5	14		0.137	-1.093	3.57					
36	15		0.147	-1.048	3.58					
36.1	16		0.157	-1.005	3.59					
37.9	17		0.168	-0.964	3.63					
38.2	18		0.178	-0.925	3.64					
39	19		0.188	-0.887	3.66					
39.4	20		0.198	-0.850	3.67					
40.7	21		0.208	-0.814	3.71					
41	22.5		0.223	-0.762	3.71					
41	22.5	!	0.223	-0.762	3.71					
42	24		0.238	-0.713	3.74					
42.4	25		0.248	-0.680	3.75					
44	26		0.258	-0.649	3.78					
44.5	27		0.268	-0.618	3.80					
44.7	28		0.278	-0.588	3.80					
45	29.5		0.293	-0.543	3.81					
45	29.5	!	0.293	-0.543	3.81					
45.9	31		0.309	-0.500	3.83					
46.7	32		0.319	-0.472	3.84					
47	34		0.339	-0.416	3.85					
47	34	!	0.339	-0.416	3.85					
47	34	!	0.339	-0.416	3.85					
48.4	36		0.359	-0.361	3.88					
48.5	37		0.369	-0.334	3.88					
49	40		0.399	-0.255	3.89					
49	40	!	0.399	-0.255	3.89					
49	40	!	0.399	-0.255	3.89					
49	40	!	0.399	-0.255	3.89					
49	40	!	0.399	-0.255	3.89					
49.8	43		0.429	-0.178	3.91					
50	44		0.440	-0.152	3.91					
50.8	45		0.450	-0.127	3.93					
53	46		0.460	-0.101	3.97					
53.5	47		0.470	-0.076	3.98					
54	48		0.480	-0.051	3.99					
54.35	49		0.490	-0.025	4.00					
54.5	50		0.500	0.000	4.00					
55.2	51		0.510	0.025	4.01					
56.2	52		0.520	0.051	4.03					
57.6	53		0.530	0.076	4.05					
59.9	54		0.540	0.101	4.09					
59.95	55		0.550	0.127	4.09					
60.8	56		0.560	0.152	4.11					

Table A-2.8
Statistical Analysis for Zinc in Soil - Gravel
Northeast Cape, St. Lawrence Island, Alaska

[Zn]i	i	ties	quantile	z-score	ln[Zn]i	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
60.9	57		0.571	0.178	4.11					
61	58.5		0.586	0.216	4.11					
61	58.5	!	0.586	0.216	4.11					
61.9	60		0.601	0.255	4.13					
64	61		0.611	0.281	4.16					
65	62		0.621	0.308	4.17					
69.45	63		0.631	0.334	4.24					
70.5	64		0.641	0.361	4.26					
72	65		0.651	0.388	4.28					
73	66.5		0.666	0.430	4.29					
73	66.5	!	0.666	0.430	4.29					
75	68		0.681	0.472	4.32					
75.2	69		0.691	0.500	4.32					
77	70		0.702	0.529	4.34					
77.5	71		0.712	0.558	4.35					
78	72		0.722	0.588	4.36					
82	73		0.732	0.618	4.41					
82.1	74		0.742	0.649	4.41					
84	75		0.752	0.680	4.43					
87.4	76		0.762	0.713	4.47					
89	77		0.772	0.746	4.49					
90.3	78		0.782	0.779	4.50					
92.4	79		0.792	0.814	4.53					
92.6	80		0.802	0.850	4.53					
94	81		0.812	0.887	4.54					
106	82		0.822	0.925	4.66					
108	83		0.832	0.964	4.68					
110	84.5		0.848	1.026	4.70					
110	84.5	!	0.848	1.026	4.70					
112	86		0.863	1.093	4.72					
118	87		0.873	1.140	4.77					
124	88		0.883	1.189	4.82					
127	89		0.893	1.242	4.84					
137	90		0.903	1.299	4.92					
140	91		0.913	1.360	4.94					
152	92		0.923	1.427	5.02					
169	93		0.933	1.500	5.13					
172	94		0.943	1.583	5.15					
183	95		0.953	1.679	5.21					
282	96		0.963	1.793	5.64					
385	97		0.974	1.936	5.95					
442	98		0.984	2.135	6.09					
460	99		0.994	2.495	6.13	3.18	3.35	no	3.3620	1.10E-01

n	99	
max	460	
min	12	
stdev	75	0.63
mean	78	4.1
CV	0.96	
Normal r2	0.58	
Lognormal r2	0.95	
k0.95;0.95,n	2.0	2.0
Normal BUTL	225	
Lognormal BUTL		214

Table A-3.1
Statistical Analysis for Beryllium in Freshwater Sediment
Northeast Cape, St. Lawrence Island, Alaska

	$[Be]_i$	i	ties	quantile	z-score	$ln[Be]_i$	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
	0.2	1		0.068	-1.494	-1.61	1.74	2.21	no	2.2728	5.15E-01
	0.3	2		0.176	-0.932	-1.20					
	0.7	3		0.284	-0.572	-0.36					
	1	5.5		0.554	0.136	0.00					
	1	5.5	!	0.554	0.136	0.00					
	1	5.5	!	0.554	0.136	0.00					
	1	5.5	!	0.554	0.136	0.00					
	1.3	8		0.824	0.932	0.26					
	3.3	9		0.932	1.494	1.19	1.70	2.21	no	2.1788	5.92E-01
n	9										
max	3.3										
min	0.20										
stdev	0.90					0.82					
mean	1.1					-0.2					
CV	0.83										
Normal r^2	0.76										
Lognormal r^2	0.94										
$k_{0.95;0.95,n}$	3.0					3.0					
Normal BUTL	3.8										
Lognormal BUTL						9.8					

Table A-3.2
Statistical Analysis for Chromium in Freshwater Sediment
Northeast Cape, St. Lawrence Island, Alaska

$[Cr]_i$	i	ties	quantile	z-score	$ln[Cr]_i$	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
2	1		0.007	-2.445	0.69	2.74	3.31	no	2.8768	4.38E-01
2.6	2		0.019	-2.078	0.96					
2.8	3		0.030	-1.874	1.03					
2.9	4		0.042	-1.728	1.06					
3.9	5		0.054	-1.611	1.36					
4.4	6		0.065	-1.512	1.48					
4.9	7		0.077	-1.427	1.59					
5	8		0.088	-1.351	1.61					
6.1	9		0.100	-1.282	1.81					
7	10		0.112	-1.218	1.95					
7.3	11		0.123	-1.159	1.99					
8	12		0.135	-1.104	2.08					
8.5	13		0.146	-1.052	2.14					
9	14.5		0.164	-0.979	2.20					
9	14.5	!	0.164	-0.979	2.20					
9.9	16		0.181	-0.911	2.29					
10	18		0.204	-0.826	2.30					
10	18	!	0.204	-0.826	2.30					
10	18	!	0.204	-0.826	2.30					
11	20		0.228	-0.747	2.40					
11.3	21		0.239	-0.709	2.42					
11.5	22		0.251	-0.672	2.44					
12	24.5		0.280	-0.584	2.48					
12	24.5	!	0.280	-0.584	2.48					
12	24.5	!	0.280	-0.584	2.48					
12	24.5	!	0.280	-0.584	2.48					
12.7	27		0.309	-0.500	2.54					
13	28.5		0.326	-0.451	2.56					
13	28.5	!	0.326	-0.451	2.56					
15	30.5		0.349	-0.387	2.71					
15	30.5	!	0.349	-0.387	2.71					
17	33.5		0.384	-0.295	2.83					
17	33.5	!	0.384	-0.295	2.83					
17	33.5	!	0.384	-0.295	2.83					
17	33.5	!	0.384	-0.295	2.83					
17.1	36		0.413	-0.220	2.84					
17.5	37		0.425	-0.190	2.86					
17.8	38		0.436	-0.161	2.88					
18	39		0.448	-0.131	2.89					
18.6	40		0.459	-0.102	2.92					
18.6	41		0.471	-0.073	2.92					
19	43.5		0.500	0.000	2.94					
19	43.5	!	0.500	0.000	2.94					
19	43.5	!	0.500	0.000	2.94					
19	43.5	!	0.500	0.000	2.94					
19.9	46		0.529	0.073	2.99					
20	47.5		0.546	0.117	3.00					
20	47.5	!	0.546	0.117	3.00					
20.8	49		0.564	0.161	3.03					
20.9	50		0.575	0.190	3.04					
21.4	51		0.587	0.220	3.06					
21.5	52		0.599	0.250	3.07					
21.7	53		0.610	0.280	3.08					
22	54.5		0.628	0.325	3.09					

Table A-3.2
Statistical Analysis for Chromium in Freshwater Sediment
Northeast Cape, St. Lawrence Island, Alaska

$[Cr]_i$	i	ties	quantile	z-score	$ln[Cr]_i$	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
22	54.5	!	0.628	0.325	3.09					
22.3	56.5		0.651	0.387	3.10					
22.3	56.5	!	0.651	0.387	3.10					
22.9	58		0.668	0.435	3.13					
23.7	59		0.680	0.467	3.17					
24	62		0.714	0.567	3.18					
24	62	!	0.714	0.567	3.18					
24	62	!	0.714	0.567	3.18					
24	62	!	0.714	0.567	3.18					
24	62	!	0.714	0.567	3.18					
24.1	65		0.749	0.672	3.18					
24.4	66		0.761	0.709	3.19					
24.5	67		0.772	0.747	3.20					
24.6	68		0.784	0.786	3.20					
24.9	69.5		0.801	0.847	3.21					
24.9	69.5	!	0.801	0.847	3.21					
25.7	71		0.819	0.911	3.25					
26.1	72		0.830	0.956	3.26					
26.6	73		0.842	1.003	3.28					
26.8	74		0.854	1.052	3.29					
27	75		0.865	1.104	3.30					
27.1	76		0.877	1.159	3.30					
27.4	77		0.888	1.218	3.31					
28.2	78		0.900	1.282	3.34					
29	79		0.912	1.351	3.37					
30	80		0.923	1.427	3.40					
30.1	81		0.935	1.512	3.40					
31	82		0.946	1.611	3.43					
39	83		0.958	1.728	3.66					
40	84		0.970	1.874	3.69					
57.1	85		0.981	2.078	4.04					
649	86		0.993	2.445	6.48	4.83	3.31	yes	5.6762	1.65E-05

n	86	
max	649	
min	2.0	
stdev	69	0.76
mean	26	2.8
CV	2.7	
Normal r^2	0.15	
Lognormal r^2	0.85	
$k_{0.95;0.95,n}$	2.0	2.0
Normal BUTL	161	
Lognormal BUTL		73

Analysis with outliers removed (1)

$[Cr]_i$	i	ties	quantile	z-score	$ln[Cr]_i$	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
2	1		0.007	-2.441	0.69	1.76	3.31	no	1.7903	6.55E+00
2.6	2		0.019	-2.074	0.96					

Table A-3.2
Statistical Analysis for Chromium in Freshwater Sediment
Northeast Cape, St. Lawrence Island, Alaska

$[Cr]_i$	i	ties	quantile	z-score	$ln[Cr]_i$	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
2.8	3		0.031	-1.869	1.03					
2.9	4		0.043	-1.722	1.06					
3.9	5		0.054	-1.605	1.36					
4.4	6		0.066	-1.506	1.48					
4.9	7		0.078	-1.421	1.59					
5	8		0.089	-1.344	1.61					
6.1	9		0.101	-1.275	1.81					
7	10		0.113	-1.211	1.95					
7.3	11		0.125	-1.152	1.99					
8	12		0.136	-1.097	2.08					
8.5	13		0.148	-1.045	2.14					
9	14.5		0.166	-0.971	2.20					
9	14.5	!	0.166	-0.971	2.20					
9.9	16		0.183	-0.903	2.29					
10	18		0.207	-0.818	2.30					
10	18	!	0.207	-0.818	2.30					
10	18	!	0.207	-0.818	2.30					
11	20		0.230	-0.738	2.40					
11.3	21		0.242	-0.700	2.42					
11.5	22		0.254	-0.663	2.44					
12	24.5		0.283	-0.574	2.48					
12	24.5	!	0.283	-0.574	2.48					
12	24.5	!	0.283	-0.574	2.48					
12	24.5	!	0.283	-0.574	2.48					
12.7	27		0.312	-0.489	2.54					
13	28.5		0.330	-0.440	2.56					
13	28.5	!	0.330	-0.440	2.56					
15	30.5		0.353	-0.376	2.71					
15	30.5	!	0.353	-0.376	2.71					
17	33.5		0.389	-0.283	2.83					
17	33.5	!	0.389	-0.283	2.83					
17	33.5	!	0.389	-0.283	2.83					
17	33.5	!	0.389	-0.283	2.83					
17.1	36		0.418	-0.207	2.84					
17.5	37		0.430	-0.177	2.86					
17.8	38		0.441	-0.148	2.88					
18	39		0.453	-0.118	2.89					
18.6	40		0.465	-0.088	2.92					
18.6	41		0.477	-0.059	2.92					
19	43.5		0.506	0.015	2.94					
19	43.5	!	0.506	0.015	2.94					
19	43.5	!	0.506	0.015	2.94					
19	43.5	!	0.506	0.015	2.94					
19.9	46		0.535	0.088	2.99					
20	47.5		0.553	0.133	3.00					
20	47.5	!	0.553	0.133	3.00					
20.8	49		0.570	0.177	3.03					
20.9	50		0.582	0.207	3.04					
21.4	51		0.594	0.237	3.06					
21.5	52		0.606	0.268	3.07					
21.7	53		0.617	0.298	3.08					
22	54.5		0.635	0.345	3.09					
22	54.5	!	0.635	0.345	3.09					
22.3	56.5		0.658	0.408	3.10					

Table A-3.2
Statistical Analysis for Chromium in Freshwater Sediment
Northeast Cape, St. Lawrence Island, Alaska

	$[Cr]_i$	i	ties	quantile	z-score	$ln[Cr]_i$	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
	22.3	56.5	!	0.658	0.408	3.10					
	22.9	58		0.676	0.456	3.13					
	23.7	59		0.688	0.489	3.17					
	24	62		0.723	0.591	3.18					
	24	62	!	0.723	0.591	3.18					
	24	62	!	0.723	0.591	3.18					
	24	62	!	0.723	0.591	3.18					
	24	62	!	0.723	0.591	3.18					
	24.1	65		0.758	0.700	3.18					
	24.4	66		0.770	0.738	3.19					
	24.5	67		0.782	0.777	3.20					
	24.6	68		0.793	0.818	3.20					
	24.9	69.5		0.811	0.881	3.21					
	24.9	69.5	!	0.811	0.881	3.21					
	25.7	71		0.828	0.948	3.25					
	26.1	72		0.840	0.995	3.26					
	26.6	73		0.852	1.045	3.28					
	26.8	74		0.864	1.097	3.29					
	27	75		0.875	1.152	3.30					
	27.1	76		0.887	1.211	3.30					
	27.4	77		0.899	1.275	3.31					
	28.2	78		0.911	1.344	3.34					
	29	79		0.922	1.421	3.37					
	30	80		0.934	1.506	3.40					
	30.1	81		0.946	1.605	3.40					
	31	82		0.957	1.722	3.43					
	39	83		0.969	1.869	3.66					
	40	84		0.981	2.074	3.69					
	57.1	85		0.993	2.441	4.04	4.14	3.31	yes	4.6485	1.06E-03
n	85										
max	57.1										
min	2.0										
stdev	9.3					0.65					
mean	18					2.7					
CV	0.51										
Normal r^2	0.94										
Lognormal r^2	0.89										
$k_{0.95;0.95,n}$	2.0					2.0					
Normal BUTL	37										
Lognormal BUTL						57					

Analysis with outliers removed (2)

	$[Cr]_i$	i	ties	quantile	z-score	$ln[Cr]_i$	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
	2	1		0.007	-2.436	0.69	1.91	3.31	no	1.9491	4.60E+00
	2.6	2		0.019	-2.069	0.96					
	2.8	3		0.031	-1.864	1.03					
	2.9	4		0.043	-1.717	1.06					
	3.9	5		0.055	-1.599	1.36					

Table A-3.2
Statistical Analysis for Chromium in Freshwater Sediment
Northeast Cape, St. Lawrence Island, Alaska

$[Cr]_i$	i	ties	quantile	z-score	$ln[Cr]_i$	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
4.4	6		0.067	-1.500	1.48					
4.9	7		0.079	-1.414	1.59					
5	8		0.091	-1.338	1.61					
6.1	9		0.102	-1.268	1.81					
7	10		0.114	-1.204	1.95					
7.3	11		0.126	-1.145	1.99					
8	12		0.138	-1.089	2.08					
8.5	13		0.150	-1.037	2.14					
9	14.5		0.168	-0.963	2.20					
9	14.5	!	0.168	-0.963	2.20					
9.9	16		0.185	-0.895	2.29					
10	18		0.209	-0.809	2.30					
10	18	!	0.209	-0.809	2.30					
10	18	!	0.209	-0.809	2.30					
11	20		0.233	-0.729	2.40					
11.3	21		0.245	-0.691	2.42					
11.5	22		0.257	-0.654	2.44					
12	24.5		0.286	-0.564	2.48					
12	24.5	!	0.286	-0.564	2.48					
12	24.5	!	0.286	-0.564	2.48					
12	24.5	!	0.286	-0.564	2.48					
12.7	27		0.316	-0.479	2.54					
13	28.5		0.334	-0.429	2.56					
13	28.5	!	0.334	-0.429	2.56					
15	30.5		0.358	-0.365	2.71					
15	30.5	!	0.358	-0.365	2.71					
17	33.5		0.393	-0.271	2.83					
17	33.5	!	0.393	-0.271	2.83					
17	33.5	!	0.393	-0.271	2.83					
17	33.5	!	0.393	-0.271	2.83					
17.1	36		0.423	-0.195	2.84					
17.5	37		0.435	-0.164	2.86					
17.8	38		0.447	-0.134	2.88					
18	39		0.458	-0.104	2.89					
18.6	40		0.470	-0.074	2.92					
18.6	41		0.482	-0.045	2.92					
19	43.5		0.512	0.030	2.94					
19	43.5	!	0.512	0.030	2.94					
19	43.5	!	0.512	0.030	2.94					
19	43.5	!	0.512	0.030	2.94					
19.9	46		0.542	0.104	2.99					
20	47.5		0.559	0.149	3.00					
20	47.5	!	0.559	0.149	3.00					
20.8	49		0.577	0.195	3.03					
20.9	50		0.589	0.225	3.04					
21.4	51		0.601	0.256	3.06					
21.5	52		0.613	0.287	3.07					
21.7	53		0.625	0.318	3.08					
22	54.5		0.642	0.365	3.09					
22	54.5	!	0.642	0.365	3.09					
22.3	56.5		0.666	0.429	3.10					
22.3	56.5	!	0.666	0.429	3.10					
22.9	58		0.684	0.479	3.13					
23.7	59		0.696	0.512	3.17					

Table A-3.2
Statistical Analysis for Chromium in Freshwater Sediment
Northeast Cape, St. Lawrence Island, Alaska

	$[Cr]_i$	i	ties	quantile	z-score	$ln[Cr]_i$	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
	24	62		0.731	0.617	3.18					
	24	62	!	0.731	0.617	3.18					
	24	62	!	0.731	0.617	3.18					
	24	62	!	0.731	0.617	3.18					
	24	62	!	0.731	0.617	3.18					
	24.1	65		0.767	0.729	3.18					
	24.4	66		0.779	0.769	3.19					
	24.5	67		0.791	0.809	3.20					
	24.6	68		0.803	0.851	3.20					
	24.9	69.5		0.820	0.917	3.21					
	24.9	69.5	!	0.820	0.917	3.21					
	25.7	71		0.838	0.987	3.25					
	26.1	72		0.850	1.037	3.26					
	26.6	73		0.862	1.089	3.28					
	26.8	74		0.874	1.145	3.29					
	27	75		0.886	1.204	3.30					
	27.1	76		0.898	1.268	3.30					
	27.4	77		0.909	1.338	3.31					
	28.2	78		0.921	1.414	3.34					
	29	79		0.933	1.500	3.37					
	30	80		0.945	1.599	3.40					
	30.1	81		0.957	1.717	3.40					
	31	82		0.969	1.864	3.43					
	39	83		0.981	2.069	3.66					
	40	84		0.993	2.436	3.69	2.63	3.31	no	2.7522	6.12E-01
n	84										
max	40										
min	2.0										
stdev	8.4					0.64					
mean	18					2.7					
CV	0.47										
Normal r^2	0.98										
Lognormal r^2	0.88										
$k_{0.95;0.95,n}$	2.0					2.0					
Normal BUTL	34										
Lognormal BUTL						54					

Table A-3.3
Statistical Analysis for Copper in Freshwater Sediment
Northeast Cape, St. Lawrence Island, Alaska

	$[Cu]_i$	i	ties	quantile	z-score	$ln[Cu]_i$	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
	1.8	1		0.068	-1.494	0.59	1.35	2.21	no	1.5587	1.47E+00
	3.2	2		0.176	-0.932	1.16					
	10.8	3		0.284	-0.572	2.38					
	10.9	4		0.392	-0.274	2.39					
	11	5		0.500	0.000	2.40					
	16	6		0.608	0.274	2.77					
	18	7		0.716	0.572	2.89					
	20	8		0.824	0.932	3.00					
	29.8	9		0.932	1.494	3.39	1.89	2.21	no	2.6461	2.98E-01
n	9										
max	29.8										
min	1.8										
stdev	8.6					0.90					
mean	14					2.3					
CV	0.64										
Normal r^2	0.95										
Lognormal r^2	0.87										
$k_{0.95;0.95,n}$	3.0					3.0					
Normal BUTL	40										
Lognormal BUTL						158					

Table A-3.4
Statistical Analysis for Lead in Freshwater Sediment
Northeast Cape, St. Lawrence Island, Alaska

[Pb]i	i	ties	quantile	z-score	ln[Pb]i	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
3.2	1		0.007	-2.445	1.16	1.51	3.31	no	1.5349	1.11E+01
4	3		0.030	-1.874	1.39					
4	3	!	0.030	-1.874	1.39					
4	3	!	0.030	-1.874	1.39					
4.5	6		0.065	-1.512	1.50					
4.5	6	!	0.065	-1.512	1.50					
4.5	6	!	0.065	-1.512	1.50					
5	11.5		0.129	-1.131	1.61					
5	11.5	!	0.129	-1.131	1.61					
5	11.5	!	0.129	-1.131	1.61					
5	11.5	!	0.129	-1.131	1.61					
5	11.5	!	0.129	-1.131	1.61					
5	11.5	!	0.129	-1.131	1.61					
5	11.5	!	0.129	-1.131	1.61					
5	11.5	!	0.129	-1.131	1.61					
6	16.5		0.187	-0.889	1.79					
6	16.5	!	0.187	-0.889	1.79					
7.5	18		0.204	-0.826	2.01					
8	20.5		0.233	-0.728	2.08					
8	20.5	!	0.233	-0.728	2.08					
8	20.5	!	0.233	-0.728	2.08					
8	20.5	!	0.233	-0.728	2.08					
9	24.5		0.280	-0.584	2.20					
9	24.5	!	0.280	-0.584	2.20					
9	24.5	!	0.280	-0.584	2.20					
9	24.5	!	0.280	-0.584	2.20					
10	29.5		0.338	-0.419	2.30					
10	29.5	!	0.338	-0.419	2.30					
10	29.5	!	0.338	-0.419	2.30					
10	29.5	!	0.338	-0.419	2.30					
10	29.5	!	0.338	-0.419	2.30					
10	29.5	!	0.338	-0.419	2.30					
11	33.5		0.384	-0.295	2.40					
11	33.5	!	0.384	-0.295	2.40					
12	35.5		0.407	-0.235	2.48					
12	35.5	!	0.407	-0.235	2.48					
13	38.5		0.442	-0.146	2.56					
13	38.5	!	0.442	-0.146	2.56					
13	38.5	!	0.442	-0.146	2.56					
13	38.5	!	0.442	-0.146	2.56					
14	42.5		0.488	-0.029	2.64					
14	42.5	!	0.488	-0.029	2.64					
14	42.5	!	0.488	-0.029	2.64					
14	42.5	!	0.488	-0.029	2.64					
15	45.5		0.523	0.058	2.71					
15	45.5	!	0.523	0.058	2.71					
15.5	47		0.541	0.102	2.74					
17	48.5		0.558	0.146	2.83					
17	48.5	!	0.558	0.146	2.83					
17.5	50		0.575	0.190	2.86					
18	51		0.587	0.220	2.89					
19.5	52		0.599	0.250	2.97					
20	53.5		0.616	0.295	3.00					
20	53.5	!	0.616	0.295	3.00					

Table A-3.4
Statistical Analysis for Lead in Freshwater Sediment
Northeast Cape, St. Lawrence Island, Alaska

[Pb]i	i	ties	quantile	z-score	ln[Pb]i	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
21	55.5		0.639	0.356	3.04					
21	55.5	!	0.639	0.356	3.04					
22	59		0.680	0.467	3.09					
22	59	!	0.680	0.467	3.09					
22	59	!	0.680	0.467	3.09					
22	59	!	0.680	0.467	3.09					
22	59	!	0.680	0.467	3.09					
23	62.5		0.720	0.584	3.14					
23	62.5	!	0.720	0.584	3.14					
24	64.5		0.743	0.654	3.18					
24	64.5	!	0.743	0.654	3.18					
27	66		0.761	0.709	3.30					
28	67		0.772	0.747	3.33					
28.5	68		0.784	0.786	3.35					
30	69.5		0.801	0.847	3.40					
30	69.5	!	0.801	0.847	3.40					
36	71.5		0.825	0.933	3.58					
36	71.5	!	0.825	0.933	3.58					
46	73.5		0.848	1.027	3.83					
46	73.5	!	0.848	1.027	3.83					
48	75		0.865	1.104	3.87					
55.5	76		0.877	1.159	4.02					
57	77		0.888	1.218	4.04					
59	78		0.900	1.282	4.08					
61	79		0.912	1.351	4.11					
64	80		0.923	1.427	4.16					
70	81		0.935	1.512	4.25					
75	82		0.946	1.611	4.32					
82	83		0.958	1.728	4.41					
113	84		0.970	1.874	4.73					
219	85		0.981	2.078	5.39					
4590	86		0.993	2.445	8.43	5.25	3.31	yes	6.4057	7.08E-07

n	86		
max	4590		
min	3.2		
stdev	493	1.1	
mean	77	2.8	
CV	6.4		
Normal r^2	0.10		
Lognormal r^2	0.87		
$k_{0.95;0.95,n}$	2.0	2.0	
Normal BUTL	1049		
Lognormal BUTL		135	

Analysis with outliers removed (1)

[Pb]i	i	ties	quantile	z-score	ln[Pb]i	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
3.2	1		0.007	-2.441	1.16	1.76	3.31	no	1.7949	6.49E+00
4.0	3		0.031	-1.869	1.39					
4.0	3	!	0.031	-1.869	1.39					

Table A-3.4
Statistical Analysis for Lead in Freshwater Sediment
Northeast Cape, St. Lawrence Island, Alaska

[Pb]i	i	ties	quantile	z-score	ln[Pb]i	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
4.0	3	!	0.031	-1.869	1.39					
4.5	6		0.066	-1.506	1.50					
4.5	6	!	0.066	-1.506	1.50					
4.5	6	!	0.066	-1.506	1.50					
5	11.5		0.130	-1.124	1.61					
5.0	11.5	!	0.130	-1.124	1.61					
5	11.5	!	0.130	-1.124	1.61					
5.0	11.5	!	0.130	-1.124	1.61					
5	11.5	!	0.130	-1.124	1.61					
5.0	11.5	!	0.130	-1.124	1.61					
5	11.5	!	0.130	-1.124	1.61					
5	11.5	!	0.130	-1.124	1.61					
6.0	16.5		0.189	-0.881	1.79					
6	16.5	!	0.189	-0.881	1.79					
8	18		0.207	-0.818	2.01					
8	20.5		0.236	-0.719	2.08					
8	20.5	!	0.236	-0.719	2.08					
8.0	20.5	!	0.236	-0.719	2.08					
8.0	20.5	!	0.236	-0.719	2.08					
9	24.5		0.283	-0.574	2.20					
9	24.5	!	0.283	-0.574	2.20					
9	24.5	!	0.283	-0.574	2.20					
9	24.5	!	0.283	-0.574	2.20					
10.0	29.5		0.342	-0.408	2.30					
10	29.5	!	0.342	-0.408	2.30					
10	29.5	!	0.342	-0.408	2.30					
10	29.5	!	0.342	-0.408	2.30					
10	29.5	!	0.342	-0.408	2.30					
10	29.5	!	0.342	-0.408	2.30					
11	33.5		0.389	-0.283	2.40					
11	33.5	!	0.389	-0.283	2.40					
12	35.5		0.412	-0.222	2.48					
12.0	35.5	!	0.412	-0.222	2.48					
13.0	38.5		0.447	-0.133	2.56					
13.0	38.5	!	0.447	-0.133	2.56					
13	38.5	!	0.447	-0.133	2.56					
13.0	38.5	!	0.447	-0.133	2.56					
14.0	42.5		0.494	-0.015	2.64					
14	42.5	!	0.494	-0.015	2.64					
14	42.5	!	0.494	-0.015	2.64					
14	42.5	!	0.494	-0.015	2.64					
15	45.5		0.529	0.074	2.71					
15.0	45.5	!	0.529	0.074	2.71					
16	47		0.547	0.118	2.74					
17	48.5		0.565	0.162	2.83					
17.0	48.5	!	0.565	0.162	2.83					
17.5	50		0.582	0.207	2.86					
18.0	51		0.594	0.237	2.89					
19.5	52		0.606	0.268	2.97					
20.0	53.5		0.623	0.314	3.00					
20	53.5	!	0.623	0.314	3.00					
21	55.5		0.647	0.376	3.04					
21.0	55.5	!	0.647	0.376	3.04					
22.0	59		0.688	0.489	3.09					

Table A-3.4
Statistical Analysis for Lead in Freshwater Sediment
Northeast Cape, St. Lawrence Island, Alaska

[Pb]i	i	ties	quantile	z-score	ln[Pb]i	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
22.0	59	!	0.688	0.489	3.09					
22.0	59	!	0.688	0.489	3.09					
22	59	!	0.688	0.489	3.09					
22	59	!	0.688	0.489	3.09					
23	62.5		0.729	0.609	3.14					
23	62.5	!	0.729	0.609	3.14					
24	64.5		0.752	0.681	3.18					
24.0	64.5	!	0.752	0.681	3.18					
27.0	66		0.770	0.738	3.30					
28.0	67		0.782	0.777	3.33					
28.5	68		0.793	0.818	3.35					
30.0	69.5		0.811	0.881	3.40					
30.0	69.5	!	0.811	0.881	3.40					
36.0	71.5		0.834	0.971	3.58					
36.0	71.5	!	0.834	0.971	3.58					
46.0	73.5		0.858	1.070	3.83					
46.0	73.5	!	0.858	1.070	3.83					
48	75		0.875	1.152	3.87					
55.5	76		0.887	1.211	4.02					
57.0	77		0.899	1.275	4.04					
59.0	78		0.911	1.344	4.08					
61	79		0.922	1.421	4.11					
64	80		0.934	1.506	4.16					
70.0	81		0.946	1.605	4.25					
75	82		0.957	1.722	4.32					
82	83		0.969	1.869	4.41					
113	84		0.981	2.074	4.73					
219	85		0.993	2.441	5.39	3.01	3.31	no	3.1875	1.72E-01

n	85									
max	219									
min	3.2									
stdev	30				0.89					
mean	24				2.7					
CV	1.3									
Normal r^2	0.58									
Lognormal r^2	0.98									
$k_{0.95;0.95,n}$	2.0				2.0					
Normal BUTL	82									
Lognormal BUTL					87					

Analysis of Data After Data Elimination Based on Visual Inspection

[Pb]i	i	ties	quantile	z-score	ln[Pb]i	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
3.2	1		0.007	-2.436	1.16	1.82	3.31	no	1.8546	5.65E+00
4	3		0.031	-1.864	1.39					
4	3	!	0.031	-1.864	1.39					
4	3	!	0.031	-1.864	1.39					
4.5	6		0.067	-1.500	1.50					
4.5	6	!	0.067	-1.500	1.50					
4.5	6	!	0.067	-1.500	1.50					

Table A-3.4
Statistical Analysis for Lead in Freshwater Sediment
Northeast Cape, St. Lawrence Island, Alaska

[Pb]i	i	ties	quantile	z-score	ln[Pb]i	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
5	11.5		0.132	-1.117	1.61					
5	11.5	!	0.132	-1.117	1.61					
5	11.5	!	0.132	-1.117	1.61					
5	11.5	!	0.132	-1.117	1.61					
5	11.5	!	0.132	-1.117	1.61					
5	11.5	!	0.132	-1.117	1.61					
5	11.5	!	0.132	-1.117	1.61					
5	11.5	!	0.132	-1.117	1.61					
6	16.5		0.191	-0.873	1.79					
6	16.5	!	0.191	-0.873	1.79					
7.5	18		0.209	-0.809	2.01					
8	20.5		0.239	-0.710	2.08					
8	20.5	!	0.239	-0.710	2.08					
8	20.5	!	0.239	-0.710	2.08					
8	20.5	!	0.239	-0.710	2.08					
9	24.5		0.286	-0.564	2.20					
9	24.5	!	0.286	-0.564	2.20					
9	24.5	!	0.286	-0.564	2.20					
9	24.5	!	0.286	-0.564	2.20					
10	29.5		0.346	-0.397	2.30					
10	29.5	!	0.346	-0.397	2.30					
10	29.5	!	0.346	-0.397	2.30					
10	29.5	!	0.346	-0.397	2.30					
10	29.5	!	0.346	-0.397	2.30					
10	29.5	!	0.346	-0.397	2.30					
11	33.5		0.393	-0.271	2.40					
11	33.5	!	0.393	-0.271	2.40					
12	35.5		0.417	-0.210	2.48					
12	35.5	!	0.417	-0.210	2.48					
13	38.5		0.453	-0.119	2.56					
13	38.5	!	0.453	-0.119	2.56					
13	38.5	!	0.453	-0.119	2.56					
13	38.5	!	0.453	-0.119	2.56					
14	42.5		0.500	0.000	2.64					
14	42.5	!	0.500	0.000	2.64					
14	42.5	!	0.500	0.000	2.64					
14	42.5	!	0.500	0.000	2.64					
15	45.5		0.536	0.089	2.71					
15	45.5	!	0.536	0.089	2.71					
15.5	47		0.553	0.134	2.74					
17	48.5		0.571	0.179	2.83					
17	48.5	!	0.571	0.179	2.83					
17.5	50		0.589	0.225	2.86					
18	51		0.601	0.256	2.89					
19.5	52		0.613	0.287	2.97					
20	53.5		0.631	0.333	3.00					
20	53.5	!	0.631	0.333	3.00					
21	55.5		0.654	0.397	3.04					
21	55.5	!	0.654	0.397	3.04					
22	59		0.696	0.512	3.09					
22	59	!	0.696	0.512	3.09					
22	59	!	0.696	0.512	3.09					
22	59	!	0.696	0.512	3.09					
22	59	!	0.696	0.512	3.09					

Table A-3.4
Statistical Analysis for Lead in Freshwater Sediment
Northeast Cape, St. Lawrence Island, Alaska

	[Pb]i	i	ties	quantile	z-score	ln[Pb]i	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
	23	62.5		0.737	0.635	3.14					
	23	62.5	!	0.737	0.635	3.14					
	24	64.5		0.761	0.710	3.18					
	24	64.5	!	0.761	0.710	3.18					
	27	66		0.779	0.769	3.30					
	28	67		0.791	0.809	3.33					
	28.5	68		0.803	0.851	3.35					
	30	69.5		0.820	0.917	3.40					
	30	69.5	!	0.820	0.917	3.40					
	36	71.5		0.844	1.012	3.58					
	36	71.5	!	0.844	1.012	3.58					
	46	73.5		0.868	1.117	3.83					
	46	73.5	!	0.868	1.117	3.83					
	48	75		0.886	1.204	3.87					
	55.5	76		0.898	1.268	4.02					
	57	77		0.909	1.338	4.04					
	59	78		0.921	1.414	4.08					
	61	79		0.933	1.500	4.11					
	64	80		0.945	1.599	4.16					
	70	81		0.957	1.717	4.25					
	75	82		0.969	1.864	4.32					
	82	83		0.981	2.069	4.41					
	113	84		0.993	2.436	4.73	2.42	3.31	no	2.5110	1.18E+00
n	84										
max	113										
min	3.2										
stdev	21					0.8					
mean	21					2.7					
CV	1.0										
Normal r^2	0.75										
Lognormal r^2	0.98										
$k_{0.95;0.95,n}$	2.0					2.0					
Normal BUTL	62										
Lognormal BUTL						78					

Note:
Visual inspection of the data resulted in an elimination of values greater than 113 mg/kg.

Table A-3.5
Statistical Analysis for Nickel in Freshwater Sediment
Northeast Cape, St. Lawrence Island, Alaska

	[Ni]i	i	ties	quantile	z-score	ln[Ni]i	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
	2.5	2		0.176	-0.932	0.92	1.17	2.21	no	1.2893	2.14E+00
	2.5	2	!	0.176	-0.932	0.92					
	2.5	2	!	0.176	-0.932	0.92					
	5	4		0.392	-0.274	1.61					
	12.5	5		0.500	0.000	2.53					
	13	6.5		0.662	0.418	2.56					
	13	6.5	!	0.662	0.418	2.56					
	14	8		0.824	0.932	2.64					
	30	9		0.932	1.494	3.40	1.50	2.21	no	1.7922	1.05E+00
n	9										
max	30										
min	2.5										
stdev	8.9					0.93					
mean	11					2.0					
CV	0.84										
Normal r^2	0.88										
Lognormal r^2	0.93										
$k_{0.95;0.95,n}$	3.0					3.0					
Normal BUTL	37										
Lognormal BUTL						126					

Table A-3.6
Statistical Analysis for Zinc in Freshwater Sediment
Northeast Cape, St. Lawrence Island, Alaska

[Zn]i	i	ties	quantile	z-score	ln[Zn]i	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
12.0	1		0.007	-2.445	2.48	1.58	3.31	no	1.6069	9.62E+00
13	2		0.019	-2.078	2.56					
14	3		0.030	-1.874	2.64					
14	4		0.042	-1.728	2.67					
15.0	5		0.054	-1.611	2.71					
16.0	6		0.065	-1.512	2.77					
16.2	7		0.077	-1.427	2.79					
17	8.5		0.094	-1.315	2.83					
17	8.5	!	0.094	-1.315	2.83					
17.9	10		0.112	-1.218	2.88					
18.0	11		0.123	-1.159	2.89					
20	12		0.135	-1.104	2.98					
21	13		0.146	-1.052	3.04					
22	14		0.158	-1.003	3.10					
23	15		0.170	-0.956	3.14					
27	16		0.181	-0.911	3.28					
28	17		0.193	-0.868	3.33					
29.5	18		0.204	-0.826	3.38					
29.8	19		0.216	-0.786	3.39					
30.0	20		0.228	-0.747	3.40					
31	21		0.239	-0.709	3.45					
32	22		0.251	-0.672	3.47					
33	23.5		0.268	-0.619	3.50					
33	23.5	!	0.268	-0.619	3.50					
33.1	25		0.286	-0.567	3.50					
34	26.5		0.303	-0.516	3.53					
34	26.5	!	0.303	-0.516	3.53					
34.6	28		0.320	-0.467	3.54					
35.0	29		0.332	-0.435	3.56					
36	30		0.343	-0.403	3.58					
37	31		0.355	-0.372	3.61					
40	32		0.367	-0.341	3.69					
43	33		0.378	-0.310	3.76					
43.5	34		0.390	-0.280	3.77					
44.0	35		0.401	-0.250	3.78					
45.0	36		0.413	-0.220	3.81					
45.1	37		0.425	-0.190	3.81					
46	38.5		0.442	-0.146	3.83					
46	38.5	!	0.442	-0.146	3.83					
48	40		0.459	-0.102	3.87					
48	41		0.471	-0.073	3.87					
49	42		0.483	-0.044	3.88					
50	43.5		0.500	0.000	3.91					
50	43.5	!	0.500	0.000	3.91					
51	45		0.517	0.044	3.93					
52	46		0.529	0.073	3.95					
52.2	47		0.541	0.102	3.96					
53	48		0.552	0.131	3.97					
54	49		0.564	0.161	3.99					
59.0	50		0.575	0.190	4.08					
60	51		0.587	0.220	4.10					
63.0	52		0.599	0.250	4.14					
64	53		0.610	0.280	4.17					
65	54		0.622	0.310	4.18					

Table A-3.6
Statistical Analysis for Zinc in Freshwater Sediment
Northeast Cape, St. Lawrence Island, Alaska

[Zn]i	i	ties	quantile	z-score	ln[Zn]i	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
66	55		0.633	0.341	4.19					
68	56.5		0.651	0.387	4.22					
68	56.5	!	0.651	0.387	4.22					
69	58.5		0.674	0.451	4.23					
69	58.5	!	0.674	0.451	4.23					
69.0	60		0.691	0.500	4.23					
71.7	61		0.703	0.533	4.27					
71.8	62		0.714	0.567	4.27					
78	63		0.726	0.601	4.36					
80	64		0.738	0.636	4.39					
81	65		0.749	0.672	4.40					
85	66		0.761	0.709	4.44					
86	67		0.772	0.747	4.45					
91.0	68		0.784	0.786	4.51					
95	69		0.796	0.826	4.55					
96.0	70		0.807	0.868	4.56					
96.3	71		0.819	0.911	4.57					
104	72		0.830	0.956	4.64					
113	73		0.842	1.003	4.73					
114	74		0.854	1.052	4.74					
122	75		0.865	1.104	4.80					
131.5	76		0.877	1.159	4.88					
148	77		0.888	1.218	5.00					
183	78		0.900	1.282	5.21					
186	79		0.912	1.351	5.23					
200	80		0.923	1.427	5.30					
223	81		0.935	1.512	5.41					
266	82		0.946	1.611	5.58					
368	83		0.958	1.728	5.91					
511	84		0.970	1.874	6.24					
1040	85		0.981	2.078	6.95					
4810	86		0.993	2.445	8.48	4.62	3.31	yes	5.3476	6.49E-05

n	86	
max	4810	
min	12	
stdev	526	0.97
mean	137	4.0
CV	3.8	
Normal r^2	0.17	
Lognormal r^2	0.89	
$k_{0.95;0.95,n}$	2.0	2.0
Normal BUTL	1174	
Lognormal BUTL		373

Analysis with outliers removed (1)

[Zn]i	i	ties	quantile	z-score	ln[Zn]i	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
12	1		0.007	-2.441	2.48	1.76	3.31	no	1.7928	6.51E+00
13.0	2		0.019	-2.074	2.56					
14.0	3		0.031	-1.869	2.64					

Table A-3.6
Statistical Analysis for Zinc in Freshwater Sediment
Northeast Cape, St. Lawrence Island, Alaska

[Zn]i	i	ties	quantile	z-score	ln[Zn]i	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
14.4	4		0.043	-1.722	2.67					
15.0	5		0.054	-1.605	2.71					
16.0	6		0.066	-1.506	2.77					
16.2	7		0.078	-1.421	2.79					
17	8.5		0.095	-1.309	2.83					
17.0	8.5	!	0.095	-1.309	2.83					
18	10		0.113	-1.211	2.88					
18.0	11		0.125	-1.152	2.89					
20	12		0.136	-1.097	2.98					
21.0	13		0.148	-1.045	3.04					
22	14		0.160	-0.995	3.10					
23	15		0.172	-0.948	3.14					
26.6	16		0.183	-0.903	3.28					
28	17		0.195	-0.860	3.33					
30	18		0.207	-0.818	3.38					
30	19		0.218	-0.777	3.39					
30	20		0.230	-0.738	3.40					
31.4	21		0.242	-0.700	3.45					
32.0	22		0.254	-0.663	3.47					
33	23.5		0.271	-0.609	3.50					
33	23.5	!	0.271	-0.609	3.50					
33	25		0.289	-0.557	3.50					
34	26.5		0.306	-0.506	3.53					
34.0	26.5	!	0.306	-0.506	3.53					
35	28		0.324	-0.456	3.54					
35	29		0.336	-0.424	3.56					
36	30		0.348	-0.392	3.58					
37	31		0.359	-0.360	3.61					
40	32		0.371	-0.329	3.69					
43	33		0.383	-0.298	3.76					
44	34		0.394	-0.268	3.77					
44	35		0.406	-0.237	3.78					
45.0	36		0.418	-0.207	3.81					
45.1	37		0.430	-0.177	3.81					
46.0	38.5		0.447	-0.133	3.83					
46	38.5	!	0.447	-0.133	3.83					
47.9	40		0.465	-0.088	3.87					
48.0	41		0.477	-0.059	3.87					
49	42		0.488	-0.029	3.88					
50	43.5		0.506	0.015	3.91					
50	43.5	!	0.506	0.015	3.91					
51	45		0.523	0.059	3.93					
52.0	46		0.535	0.088	3.95					
52	47		0.547	0.118	3.96					
53	48		0.559	0.148	3.97					
54.0	49		0.570	0.177	3.99					
59.0	50		0.582	0.207	4.08					
60.4	51		0.594	0.237	4.10					
63.0	52		0.606	0.268	4.14					
64.4	53		0.617	0.298	4.17					
65	54		0.629	0.329	4.18					
66	55		0.641	0.360	4.19					
68.0	56.5		0.658	0.408	4.22					
68.0	56.5	!	0.658	0.408	4.22					

Table A-3.6
Statistical Analysis for Zinc in Freshwater Sediment
Northeast Cape, St. Lawrence Island, Alaska

[Zn]i	i	ties	quantile	z-score	ln[Zn]i	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
68.7	58.5		0.682	0.473	4.23					
68.7	58.5	!	0.682	0.473	4.23					
69	60		0.699	0.523	4.23					
72	61		0.711	0.557	4.27					
72	62		0.723	0.591	4.27					
78	63		0.735	0.627	4.36					
80	64		0.746	0.663	4.39					
81.4	65		0.758	0.700	4.40					
85.0	66		0.770	0.738	4.44					
85.5	67		0.782	0.777	4.45					
91.0	68		0.793	0.818	4.51					
94.9	69		0.805	0.860	4.55					
96.0	70		0.817	0.903	4.56					
96.3	71		0.828	0.948	4.57					
104.0	72		0.840	0.995	4.64					
113.0	73		0.852	1.045	4.73					
114.0	74		0.864	1.097	4.74					
122	75		0.875	1.152	4.80					
131.5	76		0.887	1.211	4.88					
148.0	77		0.899	1.275	5.00					
183.0	78		0.911	1.344	5.21					
186	79		0.922	1.421	5.23					
200	80		0.934	1.506	5.30					
223.0	81		0.946	1.605	5.41					
266	82		0.957	1.722	5.58					
368	83		0.969	1.869	5.91					
511	84		0.981	2.074	6.24					
1040	85		0.993	2.441	6.95	3.55	3.31	yes	3.8608	1.89E-02

n	85		
max	1040		
min	12		
stdev	130	0.84	
mean	82	4.0	
CV	1.58		
Normal r^2	0.42		
Lognormal r^2	0.96		
$k_{0.95;0.95,n}$	2.0	2.0	
Normal BUTL	338		
Lognormal BUTL		275	

Analysis with outliers removed (2)

[Zn]i	i	ties	quantile	z-score	ln[Zn]i	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
12	1		0.007	-2.436	2.48	1.85	3.31	no	1.8935	5.19E+00
13.0	2		0.019	-2.069	2.56					
14.0	3		0.031	-1.864	2.64					
14.4	4		0.043	-1.717	2.67					
15.0	5		0.055	-1.599	2.71					
16.0	6		0.067	-1.500	2.77					
16.2	7		0.079	-1.414	2.79					

Table A-3.6
Statistical Analysis for Zinc in Freshwater Sediment
Northeast Cape, St. Lawrence Island, Alaska

[Zn]i	i	ties	quantile	z-score	ln[Zn]i	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
17	8.5		0.096	-1.302	2.83					
17.0	8.5	!	0.096	-1.302	2.83					
18	10		0.114	-1.204	2.88					
18.0	11		0.126	-1.145	2.89					
20	12		0.138	-1.089	2.98					
21.0	13		0.150	-1.037	3.04					
22	14		0.162	-0.987	3.10					
23	15		0.174	-0.940	3.14					
26.6	16		0.185	-0.895	3.28					
28	17		0.197	-0.851	3.33					
30	18		0.209	-0.809	3.38					
30	19		0.221	-0.769	3.39					
30	20		0.233	-0.729	3.40					
31.4	21		0.245	-0.691	3.45					
32.0	22		0.257	-0.654	3.47					
33	23.5		0.274	-0.599	3.50					
33	23.5	!	0.274	-0.599	3.50					
33	25		0.292	-0.547	3.50					
34	26.5		0.310	-0.496	3.53					
34.0	26.5	!	0.310	-0.496	3.53					
35	28		0.328	-0.446	3.54					
35	29		0.340	-0.413	3.56					
36	30		0.352	-0.381	3.58					
37	31		0.364	-0.349	3.61					
40	32		0.375	-0.318	3.69					
43	33		0.387	-0.287	3.76					
44	34		0.399	-0.256	3.77					
44	35		0.411	-0.225	3.78					
45.0	36		0.423	-0.195	3.81					
45.1	37		0.435	-0.164	3.81					
46.0	38.5		0.453	-0.119	3.83					
46	38.5	!	0.453	-0.119	3.83					
47.9	40		0.470	-0.074	3.87					
48.0	41		0.482	-0.045	3.87					
49	42		0.494	-0.015	3.88					
50	43.5		0.512	0.030	3.91					
50	43.5	!	0.512	0.030	3.91					
51	45		0.530	0.074	3.93					
52.0	46		0.542	0.104	3.95					
52	47		0.553	0.134	3.96					
53	48		0.565	0.164	3.97					
54.0	49		0.577	0.195	3.99					
59.0	50		0.589	0.225	4.08					
60.4	51		0.601	0.256	4.10					
63.0	52		0.613	0.287	4.14					
64.4	53		0.625	0.318	4.17					
65	54		0.636	0.349	4.18					
66	55		0.648	0.381	4.19					
68.0	56.5		0.666	0.429	4.22					
68.0	56.5	!	0.666	0.429	4.22					
68.7	58.5		0.690	0.496	4.23					
68.7	58.5	!	0.690	0.496	4.23					
69	60		0.708	0.547	4.23					
72	61		0.720	0.582	4.27					

Table A-3.6
Statistical Analysis for Zinc in Freshwater Sediment
Northeast Cape, St. Lawrence Island, Alaska

[Zn]i	i	ties	quantile	z-score	ln[Zn]i	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
72	62		0.731	0.617	4.27					
78	63		0.743	0.654	4.36					
80	64		0.755	0.691	4.39					
81.4	65		0.767	0.729	4.40					
85.0	66		0.779	0.769	4.44					
85.5	67		0.791	0.809	4.45					
91.0	68		0.803	0.851	4.51					
94.9	69		0.815	0.895	4.55					
96.0	70		0.826	0.940	4.56					
96.3	71		0.838	0.987	4.57					
104.0	72		0.850	1.037	4.64					
113.0	73		0.862	1.089	4.73					
114.0	74		0.874	1.145	4.74					
122	75		0.886	1.204	4.80					
131.5	76		0.898	1.268	4.88					
148.0	77		0.909	1.338	5.00					
183.0	78		0.921	1.414	5.21					
186	79		0.933	1.500	5.23					
200	80		0.945	1.599	5.30					
223.0	81		0.957	1.717	5.41					
266	82		0.969	1.864	5.58					
368	83		0.981	2.069	5.91					
511	84		0.993	2.436	6.24	2.97	3.31	no	3.1436	1.95E-01

n	84		
max	511		
min	12		
stdev	76	0.78	
mean	71	3.9	
CV	1.1		
Normal r^2	0.62		
Lognormal r^2	0.98		
$k_{0.95;0.95,n}$	2.0	2.0	
Normal BUTL	221		
Lognormal BUTL		235	

Analysis of Data After Data Elimination Based on Visual Inspection

[Zn]i	i	ties	quantile	z-score	ln[Zn]i	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
12.0	1		0.008	-2.405	2.48	2.09	3.26	no	2.1541	2.65E+00
13	2		0.021	-2.033	2.56					
14	3		0.034	-1.825	2.64					
14	4		0.047	-1.675	2.67					
15.0	5		0.060	-1.556	2.71					
16.0	6		0.073	-1.455	2.77					
16.2	7		0.086	-1.367	2.79					
17	8.5		0.105	-1.253	2.83					
17	8.5	!	0.105	-1.253	2.83					
17.9	10		0.125	-1.152	2.88					
18.0	11		0.138	-1.091	2.89					
20	12		0.150	-1.034	2.98					

Table A-3.6
Statistical Analysis for Zinc in Freshwater Sediment
Northeast Cape, St. Lawrence Island, Alaska

[Zn]i	i	ties	quantile	z-score	ln[Zn]i	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
21	13		0.163	-0.980	3.04					
22	14		0.176	-0.929	3.10					
23	15		0.189	-0.880	3.14					
27	16		0.202	-0.834	3.28					
28	17		0.215	-0.788	3.33					
29.5	18		0.228	-0.745	3.38					
29.8	19		0.241	-0.703	3.39					
30.0	20		0.254	-0.662	3.40					
31	21		0.267	-0.622	3.45					
32	22		0.280	-0.583	3.47					
33	23.5		0.299	-0.526	3.50					
33	23.5	!	0.299	-0.526	3.50					
33.1	25		0.319	-0.471	3.50					
34	26.5		0.338	-0.417	3.53					
34	26.5	!	0.338	-0.417	3.53					
34.6	28		0.358	-0.365	3.54					
35.0	29		0.371	-0.330	3.56					
36	30		0.383	-0.296	3.58					
37	31		0.396	-0.263	3.61					
40	32		0.409	-0.229	3.69					
43	33		0.422	-0.196	3.76					
43.5	34		0.435	-0.163	3.77					
44.0	35		0.448	-0.130	3.78					
45.0	36		0.461	-0.097	3.81					
45.1	37		0.474	-0.065	3.81					
46	38.5		0.494	-0.016	3.83					
46	38.5	!	0.494	-0.016	3.83					
48	40		0.513	0.032	3.87					
48	41		0.526	0.065	3.87					
49	42		0.539	0.097	3.88					
50	43.5		0.558	0.147	3.91					
50	43.5	!	0.558	0.147	3.91					
51	45		0.578	0.196	3.93					
52	46		0.591	0.229	3.95					
52.2	47		0.604	0.263	3.96					
53	48		0.617	0.296	3.97					
54	49		0.629	0.330	3.99					
59.0	50		0.642	0.365	4.08					
60	51		0.655	0.400	4.10					
63.0	52		0.668	0.435	4.14					
64	53		0.681	0.471	4.17					
65	54		0.694	0.508	4.18					
66	55		0.707	0.545	4.19					
68	56.5		0.727	0.602	4.22					
68	56.5	!	0.727	0.602	4.22					
69	58.5		0.752	0.682	4.23					
69	58.5	!	0.752	0.682	4.23					
69.0	60		0.772	0.745	4.23					
71.7	61		0.785	0.788	4.27					
71.8	62		0.798	0.834	4.27					
78	63		0.811	0.880	4.36					
80	64		0.824	0.929	4.39					
81	65		0.837	0.980	4.40					
85	66		0.850	1.034	4.44					

Table A-3.6
Statistical Analysis for Zinc in Freshwater Sediment
Northeast Cape, St. Lawrence Island, Alaska

[Zn]i	i	ties	quantile	z-score	ln[Zn]i	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
86	67		0.862	1.091	4.45					
91.0	68		0.875	1.152	4.51					
95	69		0.888	1.218	4.55					
96.0	70		0.901	1.289	4.56					
96.3	71		0.914	1.367	4.57					
104	72		0.927	1.455	4.64					
113	73		0.940	1.556	4.73					
114	74		0.953	1.675	4.74					
122	75		0.966	1.825	4.80					
131.5	76		0.979	2.033	4.88					
148	77		0.992	2.405	5.00	1.97	3.26	no	2.0218	3.60E+00

n	77	
max	148	
min	12	
stdev	31	0.62
mean	52	3.8
CV	0.58	
Normal r^2	0.93	
Lognormal r^2	0.98	
$k_{0.95;0.95,n}$	2.0	2.0
Normal BUTL	112	
Lognormal BUTL		148

Note:
Visual inspection of the data resulted in an elimination of values greater than 148 mg/kg.

Table A-4.1
Statistical Analysis for Aluminum in Ephemeral Surface Water
Northeast Cape, St. Lawrence Island, Alaska

	$[Al]_i$	i	ties	quantile	z-score	$ln[Al]_i$	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
	0.010	1		0.047	-1.673	-4.61	2.01	2.46	no	2.5108	3.76E-01
	0.025	2		0.123	-1.162	-3.69					
	0.040	3		0.198	-0.848	-3.22					
	0.050	4		0.274	-0.602	-3.00					
	0.065	5		0.349	-0.388	-2.73					
	0.10	6		0.425	-0.190	-2.30					
	0.11	7		0.500	0.000	-2.21					
	0.13	8		0.575	0.190	-2.04					
	0.19	9		0.651	0.388	-1.66					
	0.23	10		0.726	0.602	-1.47					
	0.24	11		0.802	0.848	-1.43					
	0.32	12		0.877	1.162	-1.14					
	0.71	13		0.953	1.673	-0.34	1.70	2.46	no	1.9665	9.75E-01
n	13										
max	0.71										
min	0.010										
stdev	0.19					1.2					
mean	0.17					-2.3					
CV	1.1										
Normal r^2	0.75										
Lognormal r^2	0.98										
$k_{0.95;0.95,n}$	2.7					2.7					
Normal BUTL	0.67										
Lognormal BUTL						2.2					

Table A-4.2
Statistical Analysis for Barium in Ephemeral Surface Water
Northeast Cape, St. Lawrence Island, Alaska

	$[Ba]_i$	i	ties	quantile	z-score	$ln[Ba]_i$	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
	0.0015	1		0.047	-1.673	-6.50	2.19	2.46	no	2.8977	1.89E-01
	0.003	2		0.123	-1.162	-5.81					
	0.005	4.5		0.311	-0.492	-5.30					
	0.005	4.5	!	0.311	-0.492	-5.30					
	0.005	4.5	!	0.311	-0.492	-5.30					
	0.005	4.5	!	0.311	-0.492	-5.30					
	0.006	7.5		0.538	0.095	-5.12					
	0.006	7.5	!	0.538	0.095	-5.12					
	0.008	9		0.651	0.388	-4.83					
	0.009	10		0.726	0.602	-4.71					
	0.01	11		0.802	0.848	-4.61					
	0.012	12		0.877	1.162	-4.42					
	0.02	13		0.953	1.673	-3.91	1.84	2.46	no	2.1944	6.58E-01
n	13										
max	0.02										
min	0.0015										
stdev	0.0047					0.64					
mean	0.0073					-5.1					
CV	0.65										
Normal r^2	0.85										
Lognormal r^2	0.96										
$k_{0.95;0.95,n}$	2.7					2.7					
Normal BUTL	0.020										
Lognormal BUTL						0.034					

Table A-4.3
Statistical Analysis for Copper in Ephemeral Surface Water
Northeast Cape, St. Lawrence Island, Alaska

	$[Cu]_i$	i	ties	quantile	z-score	$ln[Cu]_i$	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
	0.001	1		0.024	-1.981	-6.91	1.17	2.84	no	1.2036	6.25E+00
	0.001	5.5	!	0.195	-0.859	-6.91					
	0.001	5.5	!	0.195	-0.859	-6.91					
	0.001	5.5	!	0.195	-0.859	-6.91					
	0.001	5.5	!	0.195	-0.859	-6.91					
	0.001	5.5	!	0.195	-0.859	-6.91					
	0.001	5.5	!	0.195	-0.859	-6.91					
	0.001	5.5	!	0.195	-0.859	-6.91					
	0.001	5.5	!	0.195	-0.859	-6.91					
	0.002	10		0.367	-0.341	-6.21					
	0.003	11		0.405	-0.241	-5.81					
	0.004	12		0.443	-0.144	-5.52					
	0.01	18		0.671	0.444	-4.61					
	0.01	18	!	0.671	0.444	-4.61					
	0.01	18	!	0.671	0.444	-4.61					
	0.01	18	!	0.671	0.444	-4.61					
	0.01	18	!	0.671	0.444	-4.61					
	0.01	18	!	0.671	0.444	-4.61					
	0.01	18	!	0.671	0.444	-4.61					
	0.01	18	!	0.671	0.444	-4.61					
	0.01	18	!	0.671	0.444	-4.61					
	0.01	18	!	0.671	0.444	-4.61					
	0.01	18	!	0.671	0.444	-4.61					
	0.02	24		0.900	1.282	-3.91					
	0.023	25		0.938	1.539	-3.77					
	0.075	26		0.976	1.981	-2.59	2.20	2.84	no	2.4614	5.57E-01
n	26										
max	0.075										
min	0.0010										
stdev	0.015					1.3					
mean	0.0095					-5.4					
CV	1.5										
Normal r^2	0.56										
Lognormal r^2	0.92										
$k_{0.95;0.95,n}$	2.3					2.3					
Normal BUTL	0.043										
Lognormal BUTL						0.083					

Table A-4.4
Statistical Analysis for Lead in Ephemeral Surface Water
Northeast Cape, St. Lawrence Island, Alaska

$[Pb]_i$	i	ties	quantile	z-score	$ln[Pb]_i$	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
0.0005	1		0.024	-1.981	-7.60	1.00	2.84	no	1.0172	8.30E+00
0.0005	5	!	0.176	-0.930	-7.60					
0.0005	5	!	0.176	-0.930	-7.60					
0.0005	5	!	0.176	-0.930	-7.60					
0.0005	5	!	0.176	-0.930	-7.60					
0.0005	5	!	0.176	-0.930	-7.60					
0.0005	5	!	0.176	-0.930	-7.60					
0.0005	5	!	0.176	-0.930	-7.60					
0.00075	9		0.329	-0.444	-7.20					
0.001	11.5		0.424	-0.192	-6.91					
0.001	11.5	!	0.424	-0.192	-6.91					
0.001	11.5	!	0.424	-0.192	-6.91					
0.001	11.5	!	0.424	-0.192	-6.91					
0.002	16		0.595	0.241	-6.21					
0.002	16	!	0.595	0.241	-6.21					
0.002	16	!	0.595	0.241	-6.21					
0.002	16	!	0.595	0.241	-6.21					
0.002	16	!	0.595	0.241	-6.21					
0.004	19.5		0.729	0.608	-5.52					
0.004	19.5	!	0.729	0.608	-5.52					
0.005	22		0.824	0.930	-5.30					
0.005	22	!	0.824	0.930	-5.30					
0.005	22	!	0.824	0.930	-5.30					
0.006	24		0.900	1.282	-5.12					
0.011	25		0.938	1.539	-4.51					
0.065	26		0.976	1.981	-2.73	2.99	2.84	yes	3.7751	2.41E-02

n	26	
max	0.065	
min	0.00050	
stdev	0.013	1.2
mean	0.0048	-6.4
CV	2.6	
Normal r^2	0.33	
Lognormal r^2	0.90	
$k_{0.95;0.95,n}$	2.3	2.3
Normal BUTL	0.033	
Lognormal BUTL		0.027

Analysis with outliers removed (1)

$[Pb]_i$	i	ties	quantile	z-score	$ln[Pb]_i$	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
0.0005	1		0.025	-1.964	-7.60	1.08	2.82	no	1.1127	6.93E+00
0.0005	5	!	0.183	-0.903	-7.60					
0.0005	5	!	0.183	-0.903	-7.60					
0.0005	5	!	0.183	-0.903	-7.60					
0.0005	5	!	0.183	-0.903	-7.60					
0.0005	5	!	0.183	-0.903	-7.60					
0.0005	5	!	0.183	-0.903	-7.60					

Table A-4.4
Statistical Analysis for Lead in Ephemeral Surface Water
Northeast Cape, St. Lawrence Island, Alaska

$[Pb]_i$	i	ties	quantile	z-score	$ln[Pb]_i$	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
0.0005	5	!	0.183	-0.903	-7.60					
0.00075	9		0.342	-0.408	-7.20					
0.001	11.5		0.441	-0.149	-6.91					
0.001	11.5	!	0.441	-0.149	-6.91					
0.001	11.5	!	0.441	-0.149	-6.91					
0.001	11.5	!	0.441	-0.149	-6.91					
0.002	16		0.619	0.302	-6.21					
0.002	16	!	0.619	0.302	-6.21					
0.002	16	!	0.619	0.302	-6.21					
0.002	16	!	0.619	0.302	-6.21					
0.002	16	!	0.619	0.302	-6.21					
0.004	19.5		0.757	0.698	-5.52					
0.004	19.5	!	0.757	0.698	-5.52					
0.005	22		0.856	1.064	-5.30					
0.005	22	!	0.856	1.064	-5.30					
0.005	22	!	0.856	1.064	-5.30					
0.006	24		0.936	1.519	-5.12					
0.011	25		0.975	1.964	-4.51	2.05	2.82	no	2.2636	8.34E-01

n	25	
max	0.011	
min	0.00050	
stdev	0.0025	0.99
mean	0.0024	-6.5
CV	1.1	
Normal r^2	0.77	
Lognormal r^2	0.93	
$k_{0.95;0.95,n}$	2.3	2.3
Normal BUTL	0.0081	
Lognormal BUTL		0.014

Table A-4.5
Statistical Analysis for Manganese in Ephemeral Surface Water
Northeast Cape, St. Lawrence Island, Alaska

	$[Mn]_i$	i	ties	quantile	z-score	$ln[Mn]_i$	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
	0.001	1		0.047	-1.673	-6.91	1.60	2.46	no	1.8200	1.25E+00
	0.005	2		0.123	-1.162	-5.30					
	0.006	3		0.198	-0.848	-5.12					
	0.007	4		0.274	-0.602	-4.96					
	0.008	5		0.349	-0.388	-4.83					
	0.009	6		0.425	-0.190	-4.71					
	0.012	7.5		0.538	0.095	-4.42					
	0.012	7.5	!	0.538	0.095	-4.42					
	0.023	9		0.651	0.388	-3.77					
	0.029	10		0.726	0.602	-3.54					
	0.096	11		0.802	0.848	-2.34					
	0.494	12		0.877	1.162	-0.71					
	0.687	13		0.953	1.673	-0.38	1.94	2.46	no	2.3794	4.75E-01
n	13										
max	0.69										
min	0.0010										
stdev	0.22					1.84					
mean	0.11					-4.0					
CV	2.1										
Normal r^2	0.52										
Lognormal r^2	0.90										
$k_{0.95;0.95,n}$	2.7					2.7					
Normal BUTL	0.69										
Lognormal BUTL						2.6					

Analysis of Data After Data Elimination Based on Visual Inspection

	$[Mn]_i$	i	ties	quantile	z-score	$ln[Mn]_i$	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
	0.001	1		0.061	-1.547	-6.91	2.27	2.29	no	3.7536	5.60E-02
	0.005	2		0.159	-1.000	-5.30					
	0.006	3		0.256	-0.655	-5.12					
	0.007	4		0.354	-0.375	-4.96					
	0.008	5		0.451	-0.123	-4.83					
	0.009	6		0.549	0.123	-4.71					
	0.012	7.5		0.695	0.510	-4.42					
	0.012	7.5	!	0.695	0.510	-4.42					
	0.023	9		0.841	1.000	-3.77					
	0.029	10		0.939	1.547	-3.54	1.36	2.29	no	1.5313	1.64E+00
n	10										
max	0.029										
min	0.0010										
stdev	0.0086					0.93					
mean	0.011					-4.8					
CV	0.76										
Normal r^2	0.87										

Table A-4.5
Statistical Analysis for Manganese in Ephemeral Surface Water
Northeast Cape, St. Lawrence Island, Alaska

	$[Mn]_i$	i	ties	quantile	z-score	$ln[Mn]_i$	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
Lognormal r^2	0.89										
$k_{0.95;0.95,n}$	2.9					2.9					
Normal BUTL	0.036										
Lognormal BUTL						0.12					

Note:
Visual inspection of the data resulted in an elimination of values greater than 0.029 mg/L.

Table A-4.6
Statistical Analysis for Zinc in Ephemeral Surface Water
Northeast Cape, St. Lawrence Island, Alaska

$[Zn]_i$	i	ties	quantile	z-score	$ln[Zn]_i$	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
0.003	1		0.024	-1.981	-5.81	1.25	2.84	no	1.2957	5.39E+00
0.003	4.5	!	0.157	-1.006	-5.81					
0.003	4.5	!	0.157	-1.006	-5.81					
0.003	4.5	!	0.157	-1.006	-5.81					
0.003	4.5	!	0.157	-1.006	-5.81					
0.003	4.5	!	0.157	-1.006	-5.81					
0.003	4.5	!	0.157	-1.006	-5.81					
0.009	8		0.290	-0.552	-4.71					
0.011	9		0.329	-0.444	-4.51					
0.019	10		0.367	-0.341	-3.96					
0.02	11		0.405	-0.241	-3.91					
0.025	15		0.538	0.096	-3.69					
0.025	14.5	!	0.538	0.096	-3.69					
0.025	14.5	!	0.538	0.096	-3.69					
0.025	14.5	!	0.538	0.096	-3.69					
0.025	14.5	!	0.538	0.096	-3.69					
0.025	14.5	!	0.538	0.096	-3.69					
0.051	18		0.671	0.444	-2.98					
0.06	20		0.748	0.667	-2.81					
0.06	20	!	0.748	0.667	-2.81					
0.06	20	!	0.748	0.667	-2.81					
0.1	22.5		0.843	1.006	-2.30					
0.1	22.5	!	0.843	1.006	-2.30					
0.21	24		0.900	1.282	-1.56					
0.49	25		0.938	1.539	-0.71					
0.81	26		0.976	1.981	-0.21	2.21	2.84	no	2.4779	5.37E-01

n	26	
max	0.81	
min	0.0030	
stdev	0.18	1.6
mean	0.084	-3.8
CV	2.1	
Normal r^2	0.48	
Lognormal r^2	0.95	
$k_{0.95;0.95,n}$	2.3	2.3
Normal BUTL	0.49	
Lognormal BUTL		0.90

Table A-4.7
Statistical Analysis for Dissolved Zinc in Ephemeral Surface Water
Northeast Cape, St. Lawrence Island, Alaska

	$[Zn]_i$	i	ties	quantile	z-score	$ln[Zn]_i$	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
	0.025	4.5		0.311	-0.492	-3.69	0.60	2.46	no	0.6120	7.19E+00
	0.025	4.5	!	0.311	-0.492	-3.69					
	0.025	4.5	!	0.311	-0.492	-3.69					
	0.025	4.5	!	0.311	-0.492	-3.69					
	0.025	4.5	!	0.311	-0.492	-3.69					
	0.025	4.5	!	0.311	-0.492	-3.69					
	0.025	4.5	!	0.311	-0.492	-3.69					
	0.025	4.5	!	0.311	-0.492	-3.69					
	0.06	9.5		0.689	0.492	-2.81					
	0.06	9.5	!	0.689	0.492	-2.81					
	0.07	11.5		0.840	0.993	-2.66					
	0.07	11.5	!	0.840	0.993	-2.66					
	0.49	13		0.953	1.673	-0.71	2.84	2.46	yes	5.4185	2.74E-03
n	13										
max	0.49										
min	0.025										
stdev	0.13					0.86					
mean	0.073					-3.2					
CV	1.73										
Normal r^2	0.55										
Lognormal r^2	0.88										
$k_{0.95;0.95,n}$	2.7					2.7					
Normal BUTL	0.41										
Lognormal BUTL						0.42					

Analysis with outliers removed (1)

	$[Zn]_i$	i	ties	quantile	z-score	$ln[Zn]_i$	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
	0.025	4.5		0.337	-0.421	-3.69	0.67	2.41	no	0.6817	6.13E+00
	0.025	4.5	!	0.337	-0.421	-3.69					
	0.025	4.5	!	0.337	-0.421	-3.69					
	0.025	4.5	!	0.337	-0.421	-3.69					
	0.025	4.5	!	0.337	-0.421	-3.69					
	0.025	4.5	!	0.337	-0.421	-3.69					
	0.025	4.5	!	0.337	-0.421	-3.69					
	0.025	4.5	!	0.337	-0.421	-3.69					
	0.06	9.5		0.745	0.659	-2.81					
	0.06	9.5	!	0.745	0.659	-2.81					
	0.07	11.5		0.908	1.330	-2.66					
	0.07	11.5	!	0.908	1.330	-2.66	1.59	2.41	no	1.8283	1.17E+00
n	12										
max	0.070										
min	0.025										
stdev	0.020					0.47					
mean	0.038					-3.4					
CV	0.52										

Table A-4.7
Statistical Analysis for Dissolved Zinc in Ephemeral Surface Water
Northeast Cape, St. Lawrence Island, Alaska

	$[Zn]_i$	i	ties	quantile	z-score	$ln[Zn]_i$	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
Normal r^2	0.98										
Lognormal r^2	0.97										
$k_{0.95;0.95,n}$	2.7					2.7					
Normal BUTL	0.093										
Lognormal BUTL						0.12					

Table A-5.1
Statistical Analysis for Total Arsenic in Shallow Subsurface Water
Northeast Cape, St. Lawrence Island, Alaska

[As]i	i	ties	quantile	z-score	ln[As]i	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
0.0025	2		0.076	-1.429	-5.99	1.32	2.73	no	1.3805	3.85E+00
0.0025	2	!	0.076	-1.429	-5.99					
0.0025	2	!	0.076	-1.429	-5.99					
0.003	4		0.171	-0.952	-5.81					
0.004	5.5		0.241	-0.703	-5.52					
0.004	5.5	!	0.241	-0.703	-5.52					
0.006	7.5		0.335	-0.425	-5.12					
0.006	7.5	!	0.335	-0.425	-5.12					
0.007	9		0.406	-0.238	-4.96					
0.01	10		0.453	-0.118	-4.61					
0.011	11		0.500	0.000	-4.51					
0.012	12		0.547	0.118	-4.42					
0.022	13		0.594	0.238	-3.82					
0.0235	14		0.641	0.362	-3.75					
0.025	15		0.688	0.491	-3.69					
0.036	16		0.735	0.629	-3.32					
0.039	17		0.782	0.780	-3.24					
0.041	18		0.829	0.952	-3.19					
0.072	19		0.876	1.158	-2.63					
0.073	20		0.924	1.429	-2.62					
0.11	21		0.971	1.890	-2.21	1.78	2.73	no	1.9490	1.39E+00

n	21	
max	0.11	
min	0.0025	
stdev	0.029	1.2
mean	0.024	-4.4
CV	1.19	
Normal r^2	0.78	
Lognormal r^2	0.97	
$k_{0.95;0.95,n}$	2.4	2.4
Normal BUTL	0.093	
Lognormal BUTL		0.23

Table A-5.1
Statistical Analysis for Total Arsenic in Shallow Subsurface Water
Northeast Cape, St. Lawrence Island, Alaska

Analysis of Data After Data Elimination Based on Visual Inspection

[As]i	i	ties	quantile	z-score	ln[As]i	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
0.0025	2		0.133	-1.114	-5.99	1.17	2.41	no	1.2591	2.84E+00
0.0025	2	!	0.133	-1.114	-5.99					
0.0025	2	!	0.133	-1.114	-5.99					
0.003	4		0.296	-0.536	-5.81					
0.004	5.5		0.418	-0.206	-5.52					
0.004	5.5	!	0.418	-0.206	-5.52					
0.006	7.5		0.582	0.206	-5.12					
0.006	7.5	!	0.582	0.206	-5.12					
0.007	9		0.704	0.536	-4.96					
0.01	10		0.786	0.792	-4.61					
0.011	11		0.867	1.114	-4.51					
0.012	12		0.949	1.635	-4.42	1.48	2.41	no	1.6612	1.53E+00

n	12	
max	0.012	
min	0.0025	
stdev	0.0035	0.59
mean	0.0059	-5.3
CV	0.59	
Normal r^2	0.93	
Lognormal r^2	0.97	
$k_{0.95;0.95,n}$	2.7	2.7
Normal BUTL	0.015	
Lognormal BUTL		0.025

Note:
Visual inspection of the data resulted in an elimination of values greater than 0.012 mg/L.

Table A-5.2
Statistical Analysis for Beryllium in Shallow Subsurface Water
Northeast Cape, St. Lawrence Island, Alaska

	[Be]i	i	ties	quantile	z-score	ln[Be]i	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
	0.0005	2.5		0.073	-1.456	-7.60	1.24	2.89	no	1.2776	6.16E+00
	0.0005	2.5	!	0.073	-1.456	-7.60					
	0.0005	2.5	!	0.073	-1.456	-7.60					
	0.0005	2.5	!	0.073	-1.456	-7.60					
	0.002	5		0.158	-1.002	-6.21					
	0.004	6.5		0.209	-0.808	-5.52					
	0.004	6.5	!	0.209	-0.808	-5.52					
	0.01	16		0.534	0.086	-4.61					
	0.01	16	!	0.534	0.086	-4.61					
	0.01	16	!	0.534	0.086	-4.61					
	0.01	16	!	0.534	0.086	-4.61					
	0.01	16	!	0.534	0.086	-4.61					
	0.01	16	!	0.534	0.086	-4.61					
	0.01	16	!	0.534	0.086	-4.61					
	0.01	16	!	0.534	0.086	-4.61					
	0.01	16	!	0.534	0.086	-4.61					
	0.01	16	!	0.534	0.086	-4.61					
	0.01	16	!	0.534	0.086	-4.61					
	0.01	16	!	0.534	0.086	-4.61					
	0.01	16	!	0.534	0.086	-4.61					
	0.01	16	!	0.534	0.086	-4.61					
	0.01	16	!	0.534	0.086	-4.61					
	0.01	16	!	0.534	0.086	-4.61					
	0.01	16	!	0.534	0.086	-4.61					
	0.014	25		0.842	1.002	-4.27					
	0.02	27		0.910	1.342	-3.91					
	0.02	27	!	0.910	1.342	-3.91					
	0.02	27	!	0.910	1.342	-3.91					
	0.04	29		0.979	2.026	-3.22	3.81	2.89	yes	5.5968	1.79E-04
n	29										
max	0.04										
min	0.00050										
stdev	0.0078					1.2					
mean	0.010					-5.0					
CV	0.77										
Normal r^2	0.86										
Lognormal r^2	0.84										
$k_{0.95;0.95,n}$	2.2					2.2					
Normal BUTL	0.028										
Lognormal BUTL						0.093					

Table A-5.2
Statistical Analysis for Beryllium in Shallow Subsurface Water
Northeast Cape, St. Lawrence Island, Alaska

Analysis with outliers removed (1)

	[Be]i	i	ties	quantile	z-score	ln[Be]i	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
	0.0005	2.5		0.075	-1.438	-7.60	1.60	2.88	no	1.6784	2.95E+00
	0.0005	2.5	!	0.075	-1.438	-7.60					
	0.0005	2.5	!	0.075	-1.438	-7.60					
	0.0005	2.5	!	0.075	-1.438	-7.60					
	0.002	5		0.164	-0.979	-6.21					
	0.004	6.5		0.217	-0.783	-5.52					
	0.004	6.5	!	0.217	-0.783	-5.52					
	0.01	16		0.553	0.133	-4.61					
	0.01	16	!	0.553	0.133	-4.61					
	0.01	16	!	0.553	0.133	-4.61					
	0.01	16	!	0.553	0.133	-4.61					
	0.01	16	!	0.553	0.133	-4.61					
	0.01	16	!	0.553	0.133	-4.61					
	0.01	16	!	0.553	0.133	-4.61					
	0.01	16	!	0.553	0.133	-4.61					
	0.01	16	!	0.553	0.133	-4.61					
	0.01	16	!	0.553	0.133	-4.61					
	0.01	16	!	0.553	0.133	-4.61					
	0.01	16	!	0.553	0.133	-4.61					
	0.01	16	!	0.553	0.133	-4.61					
	0.01	16	!	0.553	0.133	-4.61					
	0.01	16	!	0.553	0.133	-4.61					
	0.01	16	!	0.553	0.133	-4.61					
	0.01	16	!	0.553	0.133	-4.61					
	0.014	25		0.872	1.134	-4.27					
	0.02	27		0.942	1.576	-3.91					
	0.02	27	!	0.942	1.576	-3.91					
	0.02	27	!	0.942	1.576	-3.91	2.00	2.88	no	2.1777	1.08E+00
n	28										
max	0.02										
min	0.00050										
stdev	0.0054					1.1					
mean	0.0091					-5.1					
CV	0.59										
Normal r^2	0.99										
Lognormal r^2	0.82										
$k_{0.95;0.95,n}$	2.2					2.2					
Normal BUTL	0.021										
Lognormal BUTL						0.083					

Table A-5.3
Statistical Analysis for Cadmium in Shallow Subsurface Water
Northeast Cape, St. Lawrence Island, Alaska

	[Cd]i	i	ties	quantile	z-score	ln[Cd]i	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
	0.001	3		0.090	-1.342	-6.91	1.87	2.89	no	2.0021	1.61E+00
	0.001	3	!	0.090	-1.342	-6.91					
	0.001	3	!	0.090	-1.342	-6.91					
	0.001	3	!	0.090	-1.342	-6.91					
	0.001	3	!	0.090	-1.342	-6.91					
	0.002	6		0.192	-0.869	-6.21					
	0.004	7		0.226	-0.750	-5.52					
	0.006	8		0.261	-0.641	-5.12					
	0.01	18.5		0.620	0.305	-4.61					
	0.01	18.5	!	0.620	0.305	-4.61					
	0.01	18.5	!	0.620	0.305	-4.61					
	0.01	18.5	!	0.620	0.305	-4.61					
	0.01	18.5	!	0.620	0.305	-4.61					
	0.01	18.5	!	0.620	0.305	-4.61					
	0.01	18.5	!	0.620	0.305	-4.61					
	0.01	18.5	!	0.620	0.305	-4.61					
	0.01	18.5	!	0.620	0.305	-4.61					
	0.01	18.5	!	0.620	0.305	-4.61					
	0.01	18.5	!	0.620	0.305	-4.61					
	0.01	18.5	!	0.620	0.305	-4.61					
	0.01	18.5	!	0.620	0.305	-4.61					
	0.01	18.5	!	0.620	0.305	-4.61					
	0.01	18.5	!	0.620	0.305	-4.61					
	0.01	18.5	!	0.620	0.305	-4.61					
	0.01	18.5	!	0.620	0.305	-4.61					
	0.01	18.5	!	0.620	0.305	-4.61					
	0.01	18.5	!	0.620	0.305	-4.61					
	0.01	18.5	!	0.620	0.305	-4.61					
	0.06	29		0.979	2.026	-2.81	2.24	2.89	no	2.4802	5.70E-01
n	29										
max	0.060										
min	0.0010										
stdev	0.010					1.0					
mean	0.010					-5.0					
CV	1.1										
Normal r^2	0.61										
Lognormal r^2	0.96										
$k_{0.95;0.95,n}$	2.2					2.2					
Normal BUTL	0.033										
Lognormal BUTL						0.060					

Table A-5.4
Statistical Analysis for Chromium in Shallow Subsurface Water
Northeast Cape, St. Lawrence Island, Alaska

[Cr]i	i	ties	quantile	z-score	ln[Cr]i	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
0.0025	1		0.021	-2.026	-5.99	2.07	2.89	no	2.2530	9.45E-01
0.01	4.5		0.141	-1.076	-4.61					
0.01	4.5	!	0.141	-1.076	-4.61					
0.01	4.5	!	0.141	-1.076	-4.61					
0.01	4.5	!	0.141	-1.076	-4.61					
0.01	4.5	!	0.141	-1.076	-4.61					
0.01	4.5	!	0.141	-1.076	-4.61					
0.014	8.5		0.278	-0.589	-4.27					
0.014	8.5	!	0.278	-0.589	-4.27					
0.03	10.5		0.346	-0.396	-3.51					
0.03	10.5	!	0.346	-0.396	-3.51					
0.04	12		0.397	-0.260	-3.22					
0.05	13		0.432	-0.172	-3.00					
0.055	14		0.466	-0.086	-2.90					
0.07	15		0.500	0.000	-2.66					
0.075	16		0.534	0.086	-2.59					
0.08	17		0.568	0.172	-2.53					
0.09	18		0.603	0.260	-2.41					
0.099	19		0.637	0.350	-2.31					
0.14	20.5		0.688	0.490	-1.97					
0.14	20.5	!	0.688	0.490	-1.97					
0.23	22		0.739	0.641	-1.47					
0.24	23		0.774	0.750	-1.43					
0.25	24		0.808	0.869	-1.39					
0.255	25		0.842	1.002	-1.37					
0.28	26		0.876	1.156	-1.27					
0.37	27		0.910	1.342	-0.99					
0.52	28		0.944	1.593	-0.65					
1.22	29		0.979	2.026	0.20	2.03	2.89	no	2.1998	1.06E+00

n	29	
max	1.2	
min	0.0025	
stdev	0.24	1.5
mean	0.15	-2.9
CV	1.6	
Normal r^2	0.59	
Lognormal r^2	0.98	
$k_{0.95;0.95,n}$	2.2	2.2
Normal BUTL	0.69	
Lognormal BUTL		1.67

Table A-5.5
Statistical Analysis for Cobalt in Shallow Subsurface Water
Northeast Cape, St. Lawrence Island, Alaska

	[Co]i	i	ties	quantile	z-score	ln[Co]i	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
	0.0015	1		0.076	-1.434	-6.50	1.41	2.13	no	1.6999	1.12E+00
	0.004	2.5		0.258	-0.651	-5.52					
	0.004	2.5	!	0.258	-0.651	-5.52					
	0.005	4		0.439	-0.153	-5.30					
	0.012	5		0.561	0.153	-4.42					
	0.037	6		0.682	0.473	-3.30					
	0.052	7		0.803	0.852	-2.96					
	0.064	8		0.924	1.434	-2.75	1.28	2.13	no	1.4789	1.52E+00
n	8										
max	0.064										
min	0.0015										
stdev	0.025					1.4					
mean	0.022					-4.5					
CV	1.1										
Normal r^2	0.83										
Lognormal r^2	0.94										
$k_{0.95;0.95,n}$	3.2					3.2					
Normal BUTL	0.10										
Lognormal BUTL						0.92					

Analysis of Data After Data Elimination Based on Visual Inspection

	[Co]i	i	ties	quantile	z-score	ln[Co]i	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
	0.0015	1		0.147	-1.049	-6.50	1.42	1.48	no	4.2500	2.05E-01
	0.004	2.5		0.500	0.000	-5.52					
	0.004	2.5	!	0.500	0.000	-5.52					
	0.005	4		0.853	1.049	-5.30	0.92	1.48	no	1.1000	1.54E+00
n	4										
max	0.0050										
min	0.0015										
stdev	0.0015					0.54					
mean	0.0036					-5.7					
CV	0.41										
Normal r^2	0.92										
Lognormal r^2	0.83										
$k_{0.95;0.95,n}$	5.1					5.1					
Normal BUTL	0.011										
Lognormal BUTL						0.053					

Note:
Visual inspection of the data resulted in an elimination of values greater than 0.005 mg/L.

Table A-5.6
Statistical Analysis for Copper in Shallow Subsurface Water
Northeast Cape, St. Lawrence Island, Alaska

[Cu]i	i	ties	quantile	z-score	ln[Cu]i	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
0.0020	1		0.021	-2.026	-6.21	2.42	2.89	no	2.7376	3.14E-01
0.01	3.5		0.107	-1.244	-4.61					
0.01	3.5	!	0.107	-1.244	-4.61					
0.01	3.5	!	0.107	-1.244	-4.61					
0.01	3.5	!	0.107	-1.244	-4.61					
0.011	6		0.192	-0.869	-4.51					
0.017	7		0.226	-0.750	-4.07					
0.018	8		0.261	-0.641	-4.02					
0.025	9		0.295	-0.539	-3.69					
0.03	10		0.329	-0.443	-3.51					
0.04	11.5		0.380	-0.305	-3.22					
0.04	11.5	!	0.380	-0.305	-3.22					
0.045	13		0.432	-0.172	-3.10					
0.046	14		0.466	-0.086	-3.08					
0.06	15		0.500	0.000	-2.81					
0.065	16		0.534	0.086	-2.73					
0.067	17		0.568	0.172	-2.70					
0.068	18		0.603	0.260	-2.69					
0.1	19		0.637	0.350	-2.30					
0.14	20		0.671	0.443	-1.97					
0.16	21		0.705	0.539	-1.83					
0.18	22		0.739	0.641	-1.71					
0.2	23		0.774	0.750	-1.61					
0.21	24		0.808	0.869	-1.56					
0.26	25.5		0.859	1.076	-1.35					
0.26	25.5	!	0.859	1.076	-1.35					
0.27	27		0.910	1.342	-1.31					
0.3	28		0.944	1.593	-1.20					
0.5	29		0.979	2.026	-0.69	1.65	2.89	no	1.7346	2.73E+00

n	29	
max	0.5	
min	0.0020	
stdev	0.12	1.4
mean	0.11	-2.9
CV	1.1	
Normal r^2	0.81	
Lognormal r^2	0.97	
$k_{0.95;0.95,n}$	2.2	2.2
Normal BUTL	0.38	
Lognormal BUTL		1.1

Table A-5.6
Statistical Analysis for Copper in Shallow Subsurface Water
Northeast Cape, St. Lawrence Island, Alaska

Analysis of Data After Data Elimination Based on Visual Inspection

	[Cu]i	i	ties	quantile	z-score	ln[Cu]i	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
	0.0020	1		0.034	-1.822	-6.21	1.33	2.65	no	1.4027	3.24E+00
	0.01	3.5		0.171	-0.949	-4.61					
	0.01	3.5	!	0.171	-0.949	-4.61					
	0.01	3.5	!	0.171	-0.949	-4.61					
	0.01	3.5	!	0.171	-0.949	-4.61					
	0.011	6		0.308	-0.501	-4.51					
	0.017	7		0.363	-0.350	-4.07					
	0.018	8		0.418	-0.208	-4.02					
	0.025	9		0.473	-0.069	-3.69					
	0.03	10		0.527	0.069	-3.51					
	0.04	11.5		0.610	0.278	-3.22					
	0.04	11.5	!	0.610	0.278	-3.22					
	0.045	13		0.692	0.501	-3.10					
	0.046	14		0.747	0.664	-3.08					
	0.06	15		0.801	0.847	-2.81					
	0.065	16		0.856	1.063	-2.73					
	0.067	17		0.911	1.347	-2.70					
	0.068	18		0.966	1.822	-2.69	1.60	2.65	no	1.7447	1.80E+00
n	18										
max	0.068										
min	0.0020										
stdev	0.023					0.95					
mean	0.032					-3.8					
CV	0.71										
Normal r^2	0.93										
Lognormal r^2	0.91										
$k_{0.95;0.95,n}$	2.5					2.5					
Normal BUTL	0.087										
Lognormal BUTL						0.24					

Note:
Visual inspection of the data resulted in an elimination of values greater than 0.068 mg/L.

Table A-5.7
Statistical Analysis for Total Lead in Shallow Subsurface Water
Northeast Cape, St. Lawrence Island, Alaska

[Pb]i	i	ties	quantile	z-score	ln[Pb]i	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
0.0020	1		0.020	-2.054	-6.21	1.96	2.92	no	2.1069	1.36E+00
0.0029	2		0.052	-1.626	-5.84					
0.005	3		0.084	-1.379	-5.30					
0.006	4.5		0.132	-1.117	-5.12					
0.006	4.5	!	0.132	-1.117	-5.12					
0.007	6		0.180	-0.915	-4.96					
0.008	7		0.212	-0.800	-4.83					
0.017	8		0.244	-0.693	-4.07					
0.019	9		0.276	-0.595	-3.96					
0.026	10		0.308	-0.502	-3.65					
0.0325	11		0.340	-0.412	-3.43					
0.038	12		0.372	-0.327	-3.27					
0.04	13		0.404	-0.243	-3.22					
0.045	14		0.436	-0.161	-3.10					
0.046	15		0.468	-0.080	-3.08					
0.056	16		0.500	0.000	-2.88					
0.1	17		0.532	0.080	-2.30					
0.14	18		0.564	0.161	-1.97					
0.16	19		0.596	0.243	-1.83					
0.185	20		0.628	0.327	-1.69					
0.2	21		0.660	0.412	-1.61					
0.21	22		0.692	0.502	-1.56					
0.23	23		0.724	0.595	-1.47					
0.26	24		0.756	0.693	-1.35					
0.3	25		0.788	0.800	-1.20					
0.33	26		0.820	0.915	-1.11					
0.4	27		0.852	1.045	-0.92					
0.42	28		0.884	1.195	-0.87					
0.45	29		0.916	1.379	-0.80					
0.67	30		0.948	1.626	-0.40					
0.68	31		0.980	2.054	-0.39	1.41	2.92	no	1.4606	4.80E+00

n	31	
max	0.68	
min	0.0020	
stdev	0.19	1.7
mean	0.16	-2.8
CV	1.2	
Normal r^2	0.81	
Lognormal r^2	0.95	
$k_{0.95;0.95,n}$	2.2	2.2
Normal BUTL	0.59	
Lognormal BUTL		2.7

Table A-5.7
Statistical Analysis for Total Lead in Shallow Subsurface Water
Northeast Cape, St. Lawrence Island, Alaska

Analysis of Data After Data Elimination Based on Visual Inspection

	[Pb]i	i	ties	quantile	z-score	ln[Pb]i	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
	0.0020	1		0.086	-1.364	-6.21	1.52	2.02	no	2.0129	7.02E-01
	0.0029	2		0.224	-0.758	-5.84					
	0.005	3		0.362	-0.353	-5.30					
	0.006	4.5		0.569	0.174	-5.12					
	0.006	4.5	!	0.569	0.174	-5.12					
	0.007	6		0.776	0.758	-4.96					
	0.008	7		0.914	1.364	-4.83	1.27	2.02	no	1.5037	1.35E+00
n	7										
max	0.0080										
min	0.0020										
stdev	0.0022					0.50					
mean	0.0053					-5.3					
CV	0.41										
Normal r^2	0.96										
Lognormal r^2	0.89										
$k_{0.95;0.95,n}$	3.4					3.4					
Normal BUTL	0.013										
Lognormal BUTL						0.027					

Note:
Visual inspection of the data resulted in an elimination of values greater than 0.008 mg/L.

Table A-5.8
Statistical Analysis for Manganese in Shallow Subsurface Water
Northeast Cape, St. Lawrence Island, Alaska

	[Mn]i	i	ties	quantile	z-score	ln[Mn]i	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
	0.0560	1		0.061	-1.547	-2.88	1.21	2.29	no	1.3239	2.22E+00
	0.06	2		0.159	-1.000	-2.81					
	0.09	3		0.256	-0.655	-2.41					
	0.105	4		0.354	-0.375	-2.25					
	0.2029	5		0.451	-0.123	-1.60					
	0.326	6		0.549	0.123	-1.12					
	0.593	7		0.646	0.375	-0.52					
	0.6166	8		0.744	0.655	-0.48					
	1.58	9		0.841	1.000	0.46					
	2.24	10		0.939	1.547	0.81	1.57	2.29	no	1.8770	9.74E-01
n	10										
max	2.24										
min	0.056										
stdev	0.74					1.3					
mean	0.59					-1.3					
CV	1.3										
Normal r^2	0.75										
Lognormal r^2	0.95										
$k_{0.95;0.95,n}$	2.9					2.9					
Normal BUTL	2.8										
Lognormal BUTL						13					

Analysis of Data After Data Elimination Based on Visual Inspection

	[Mn]i	i	ties	quantile	z-score	ln[Mn]i	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
	0.0560	1		0.147	-1.049	-2.88	0.39	1.48	no	0.3791	2.96E+00
	0.06	2		0.382	-0.299	-2.81					
	0.09	3		0.618	0.299	-2.41					
	0.105	4		0.853	1.049	-2.25	0.49	1.48	no	0.4850	2.70E+00
n	4										
max	0.105										
min	0.056										
stdev	0.024					0.31					
mean	0.078					-2.6					
CV	0.30										
Normal r^2	0.911										
Lognormal r^2	0.910										
$k_{0.95;0.95,n}$	5.1					5.1					
Normal BUTL	0.20										
Lognormal BUTL						0.36					

Note:
Visual inspection of the data resulted in an elimination of values greater than 0.105 mg/L.

Table A-5.9
Statistical Analysis for Total Mercury in Shallow Subsurface Water
Northeast Cape, St. Lawrence Island, Alaska

	[Hg]i	i	ties	quantile	z-score	ln[Hg]i	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
	0.00005	1.5		0.053	-1.617	-9.90	1.67	2.73	no	1.8020	1.84E+00
	0.00005	1.5	!	0.053	-1.617	-9.90					
	0.0001	3		0.124	-1.158	-9.21					
	0.0002	5.5		0.241	-0.703	-8.52					
	0.0002	5.5	!	0.241	-0.703	-8.52					
	0.0002	5.5	!	0.241	-0.703	-8.52					
	0.0002	5.5	!	0.241	-0.703	-8.52					
	0.00025	13.5		0.618	0.299	-8.29					
	0.00025	13.5	!	0.618	0.299	-8.29					
	0.00025	13.5	!	0.618	0.299	-8.29					
	0.00025	13.5	!	0.618	0.299	-8.29					
	0.00025	13.5	!	0.618	0.299	-8.29					
	0.00025	13.5	!	0.618	0.299	-8.29					
	0.00025	13.5	!	0.618	0.299	-8.29					
	0.00025	13.5	!	0.618	0.299	-8.29					
	0.00025	13.5	!	0.618	0.299	-8.29					
	0.00025	13.5	!	0.618	0.299	-8.29					
	0.00025	13.5	!	0.618	0.299	-8.29					
	0.00025	13.5	!	0.618	0.299	-8.29					
	0.0004	20		0.924	1.429	-7.82					
	0.0006	21		0.971	1.890	-7.42	3.21	2.73	yes	4.7258	3.09E-03
n	21										
max	0.0006										
min	0.000050										
stdev	0.00011					0.57					
mean	0.00024					-8.5					
CV	0.47										
Normal r^2	0.87										
Lognormal r^2	0.84										
$k_{0.95;0.95,n}$	2.4					2.4					
Normal BUTL	0.00051										
Lognormal BUTL						0.00082					

Table A-5.9
Statistical Analysis for Total Mercury in Shallow Subsurface Water
Northeast Cape, St. Lawrence Island, Alaska

Analysis with outliers removed (1)

	[Hg]i	i	ties	quantile	z-score	ln[Hg]i	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
	0.00005	1.5		0.056	-1.593	-9.90	2.17	2.71	no	2.5149	4.33E-01
	0.00005	1.5	!	0.056	-1.593	-9.90					
	0.0001	3		0.130	-1.128	-9.21					
	0.0002	5.5		0.253	-0.665	-8.52					
	0.0002	5.5	!	0.253	-0.665	-8.52					
	0.0002	5.5	!	0.253	-0.665	-8.52					
	0.0002	5.5	!	0.253	-0.665	-8.52					
	0.00025	13.5		0.648	0.380	-8.29					
	0.00025	13.5	!	0.648	0.380	-8.29					
	0.00025	13.5	!	0.648	0.380	-8.29					
	0.00025	13.5	!	0.648	0.380	-8.29					
	0.00025	13.5	!	0.648	0.380	-8.29					
	0.00025	13.5	!	0.648	0.380	-8.29					
	0.00025	13.5	!	0.648	0.380	-8.29					
	0.00025	13.5	!	0.648	0.380	-8.29					
	0.00025	13.5	!	0.648	0.380	-8.29					
	0.00025	13.5	!	0.648	0.380	-8.29					
	0.00025	13.5	!	0.648	0.380	-8.29					
	0.00025	13.5	!	0.648	0.380	-8.29					
	0.0004	20		0.969	1.868	-7.82	2.29	2.71	no	2.7213	2.80E-01
n	20										
max	0.0004										
min	0.000050										
stdev	0.000078					0.53					
mean	0.00022					-8.5					
CV	0.36										
Normal r^2	0.93										
Lognormal r^2	0.78										
$k_{0.95;0.95,n}$	2.4					2.4					
Normal BUTL	0.00041										
Lognormal BUTL						0.00071					

Table A-5.10
Statistical Analysis for Nickel in Shallow Subsurface Water
Northeast Cape, St. Lawrence Island, Alaska

	[Ni]i	i	ties	quantile	z-score	ln[Ni]i	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
	0.005	2		0.056	-1.593	-5.30	1.69	2.89	no	1.7848	2.48E+00
	0.005	2	!	0.056	-1.593	-5.30					
	0.005	2	!	0.056	-1.593	-5.30					
	0.025	8		0.261	-0.641	-3.69					
	0.025	8	!	0.261	-0.641	-3.69					
	0.025	8	!	0.261	-0.641	-3.69					
	0.025	8	!	0.261	-0.641	-3.69					
	0.025	8	!	0.261	-0.641	-3.69					
	0.025	8	!	0.261	-0.641	-3.69					
	0.025	8	!	0.261	-0.641	-3.69					
	0.025	8	!	0.261	-0.641	-3.69					
	0.025	8	!	0.261	-0.641	-3.69					
	0.0425	13		0.432	-0.172	-3.16					
	0.0475	14		0.466	-0.086	-3.05					
	0.08	15		0.500	0.000	-2.53					
	0.09	16		0.534	0.086	-2.41					
	0.1	17		0.568	0.172	-2.30					
	0.11	18.5		0.620	0.305	-2.21					
	0.11	18.5	!	0.620	0.305	-2.21					
	0.12	20		0.671	0.443	-2.12					
	0.16	21		0.705	0.539	-1.83					
	0.17	22		0.739	0.641	-1.77					
	0.18	23		0.774	0.750	-1.71					
	0.2	24		0.808	0.869	-1.61					
	0.23	25		0.842	1.002	-1.47					
	0.24	26		0.876	1.156	-1.43					
	0.42	27		0.910	1.342	-0.87					
	1.68	28		0.944	1.593	0.52					
	3.54	29		0.979	2.026	1.26	2.56	2.89	no	2.9379	1.94E-01
n	29										
max	3.54										
min	0.0050										
stdev	0.70					1.5					
mean	0.27					-2.7					
CV	2.6										
Normal r^2	0.38										
Lognormal r^2	0.97										
$k_{0.95;0.95,n}$	2.2					2.2					
Normal BUTL	1.8										
Lognormal BUTL						2.1					

Table A-5.10
Statistical Analysis for Nickel in Shallow Subsurface Water
Northeast Cape, St. Lawrence Island, Alaska

Analysis of Data After Data Elimination Based on Visual Inspection

	[Ni]i	i	ties	quantile	z-score	ln[Ni]i	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
	0.005	2		0.114	-1.205	-5.30	1.50	2.51	no	1.6626	1.71E+00
	0.005	2	!	0.114	-1.205	-5.30					
	0.005	2	!	0.114	-1.205	-5.30					
	0.025	8		0.535	0.088	-3.69					
	0.025	8	!	0.535	0.088	-3.69					
	0.025	8	!	0.535	0.088	-3.69					
	0.025	8	!	0.535	0.088	-3.69					
	0.025	8	!	0.535	0.088	-3.69					
	0.025	8	!	0.535	0.088	-3.69					
	0.025	8	!	0.535	0.088	-3.69					
	0.025	8	!	0.535	0.088	-3.69					
	0.025	8	!	0.535	0.088	-3.69					
	0.0425	13		0.886	1.205	-3.16					
	0.0475	14		0.956	1.708	-3.05	1.94	2.51	no	2.3263	5.37E-01
n	14										
max	0.0475										
min	0.0050										
stdev	0.012					0.76					
mean	0.024					-4.0					
CV	0.52										
Normal r^2	0.998										
Lognormal r^2	0.87										
$k_{0.95;0.95,n}$	2.6					2.6					
Normal BUTL	0.056										
Lognormal BUTL						0.14					

Note:
Visual inspection of the data resulted in an elimination of values greater than 0.0475 mg/L.

Table A-5.11
Statistical Analysis for Vanadium in Shallow Subsurface Water
Northeast Cape, St. Lawrence Island, Alaska

	$[V]_i$	i	ties	quantile	z-score	$ln[V]_i$	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
	0.0015	1		0.076	-1.434	-6.50	1.18	2.13	no	1.3234	1.87E+00
	0.02	2		0.197	-0.852	-3.91					
	0.029	3		0.318	-0.473	-3.54					
	0.035	4		0.439	-0.153	-3.35					
	0.079	5		0.561	0.153	-2.54					
	0.097	6		0.682	0.473	-2.33					
	0.149	7		0.803	0.852	-1.90					
	0.153	8		0.924	1.434	-1.88	1.41	2.13	no	1.6962	1.13E+00
n	8										
max	0.153										
min	0.0015										
stdev	0.059					1.5					
mean	0.070					-3.2					
CV	0.83										
Normal r^2	0.92										
Lognormal r^2	0.83										
$k_{0.95;0.95,n}$	3.2					3.2					
Normal BUTL	0.26										
Lognormal BUTL						4.9					

Analysis of Data After Data Elimination Based on Visual Inspection

	$[V]_i$	i	ties	quantile	z-score	$ln[V]_i$	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
	0.0015	1		0.147	-1.049	-6.50	1.36	1.48	no	3.0398	3.73E-01
	0.02	2		0.382	-0.299	-3.91					
	0.029	3		0.618	0.299	-3.54					
	0.035	4		0.853	1.049	-3.35	0.93	1.48	no	1.1221	1.51E+00
n	4										
max	0.035										
min	0.0015										
stdev	0.015					1.5					
mean	0.021					-4.3					
CV	0.68										
Normal r^2	0.94										
Lognormal r^2	0.76										
$k_{0.95;0.95,n}$	5.1					5.1					
Normal BUTL	0.097										
Lognormal BUTL						25					

Note:
Visual inspection of the data resulted in an elimination of values greater than 0.035 mg/L.

Table A-5.12
Statistical Analysis for Zinc in Shallow Subsurface Water
Northeast Cape, St. Lawrence Island, Alaska

[Zn]i	i	ties	quantile	z-score	ln[Zn]i	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
0.0030	1		0.021	-2.026	-5.81	2.31	2.89	no	2.5830	4.50E-01
0.02	2		0.056	-1.593	-3.91					
0.023	3		0.090	-1.342	-3.77					
0.025	5.5		0.175	-0.934	-3.69					
0.025	5.5	!	0.175	-0.934	-3.69					
0.025	5.5	!	0.175	-0.934	-3.69					
0.025	5.5	!	0.175	-0.934	-3.69					
0.09	8		0.261	-0.641	-2.41					
0.12	9		0.295	-0.539	-2.12					
0.14	10		0.329	-0.443	-1.97					
0.146	11		0.363	-0.350	-1.92					
0.175	12		0.397	-0.260	-1.74					
0.18	13		0.432	-0.172	-1.71					
0.235	14		0.466	-0.086	-1.45					
0.419	15		0.500	0.000	-0.87					
0.43	16		0.534	0.086	-0.84					
0.49	17		0.568	0.172	-0.71					
0.512	18		0.603	0.260	-0.67					
0.54	19		0.637	0.350	-0.62					
0.59	20		0.671	0.443	-0.53					
0.65	21		0.705	0.539	-0.43					
0.66	22		0.739	0.641	-0.42					
0.8	23		0.774	0.750	-0.22					
1	24.5		0.825	0.934	0.00					
1	24.5	!	0.825	0.934	0.00					
1.5	26		0.876	1.156	0.41					
2.47	27		0.910	1.342	0.90					
5.1	28		0.944	1.593	1.63					
17.7	29		0.979	2.026	2.87	2.26	2.89	no	2.5081	5.35E-01

n	29	
max	17.7	
min	0.0030	
stdev	3.3	1.9
mean	1.2	-1.4
CV	2.8	
Normal r^2	0.34	
Lognormal r^2	0.97	
$k_{0.95;0.95,n}$	2.2	2.2
Normal BUTL	8.6	
Lognormal BUTL		17

Table A-5.12
Statistical Analysis for Zinc in Shallow Subsurface Water
Northeast Cape, St. Lawrence Island, Alaska

Analysis of Data After Data Elimination Based on Visual Inspection

	[Zn]i	i	ties	quantile	z-score	ln[Zn]i	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
	0.0030	1		0.044	-1.708	-5.81	1.11	2.51	no	1.1640	3.74E+00
	0.02	2		0.114	-1.205	-3.91					
	0.023	3		0.184	-0.899	-3.77					
	0.025	5.5		0.360	-0.359	-3.69					
	0.025	5.5	!	0.360	-0.359	-3.69					
	0.025	5.5	!	0.360	-0.359	-3.69					
	0.025	5.5	!	0.360	-0.359	-3.69					
	0.09	8		0.535	0.088	-2.41					
	0.12	9		0.605	0.267	-2.12					
	0.14	10		0.675	0.455	-1.97					
	0.146	11		0.746	0.661	-1.92					
	0.175	12		0.816	0.899	-1.74					
	0.18	13		0.886	1.205	-1.71					
	0.235	14		0.956	1.708	-1.45	1.91	2.51	no	2.2864	5.77E-01
n	14										
max	0.235										
min	0.0030										
stdev	0.077					1.2					
mean	0.088					-3.0					
CV	0.87										
Normal r^2	0.885										
Lognormal r^2	0.883										
$k_{0.95;0.95,n}$	2.6					2.6					
Normal BUTL	0.29										
Lognormal BUTL						1.3					

Note:
Visual inspection of the data resulted in an elimination of values greater than 0.235 mg/L.

Table A-5.13
Statistical Analysis for Dissolved Arsenic in Shallow Subsurface Water
Northeast Cape, St. Lawrence Island, Alaska

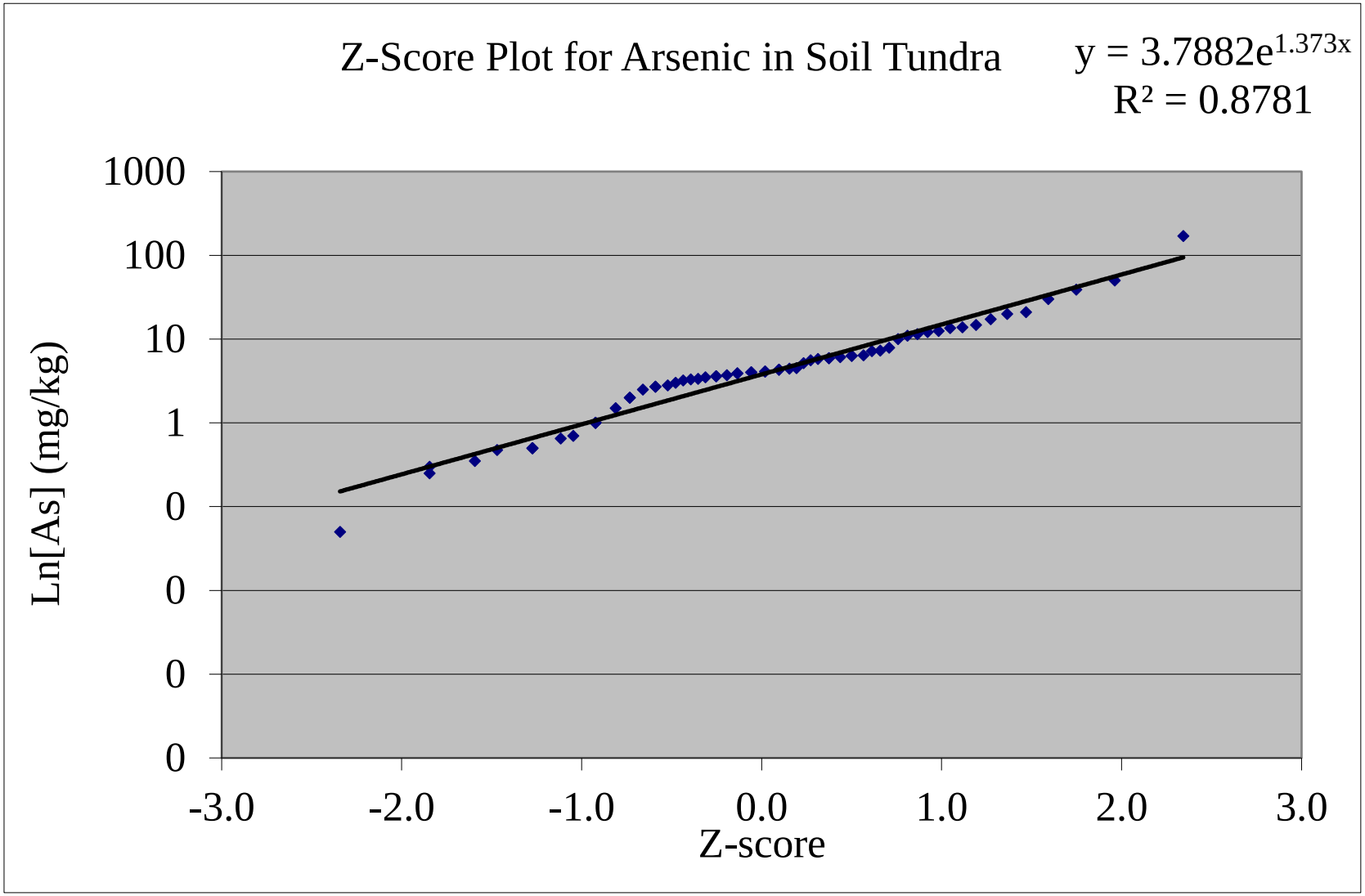
	[As]i	i	ties	quantile	z-score	ln[As]i	Grubb's z	Critical z	Outlier ?	*T*	Grubb's p
	0.0025	5.5		0.387	-0.288	-5.99	0.51	2.46	no	0.5157	8.01E+00
	0.0025	5.5	!	0.387	-0.288	-5.99					
	0.0025	5.5	!	0.387	-0.288	-5.99					
	0.0025	5.5	!	0.387	-0.288	-5.99					
	0.0025	5.5	!	0.387	-0.288	-5.99					
	0.0025	5.5	!	0.387	-0.288	-5.99					
	0.0025	5.5	!	0.387	-0.288	-5.99					
	0.0025	5.5	!	0.387	-0.288	-5.99					
	0.0025	5.5	!	0.387	-0.288	-5.99					
	0.0025	5.5	!	0.387	-0.288	-5.99					
	0.006	11		0.802	0.848	-5.12					
	0.01	12		0.877	1.162	-4.61					
	0.011	13		0.953	1.673	-4.51	2.12	2.46	no	2.7398	2.50E-01
n	13										
max	0.011										
min	0.0025										
stdev	0.0030					0.56					
mean	0.0040					-5.7					
CV	0.76										
Normal r^2	0.97										
Lognormal r^2	0.98										
$k_{0.95;0.95,n}$	2.7					2.7					
Normal BUTL	0.012										
Lognormal BUTL						0.015					

Appendix B

MWH

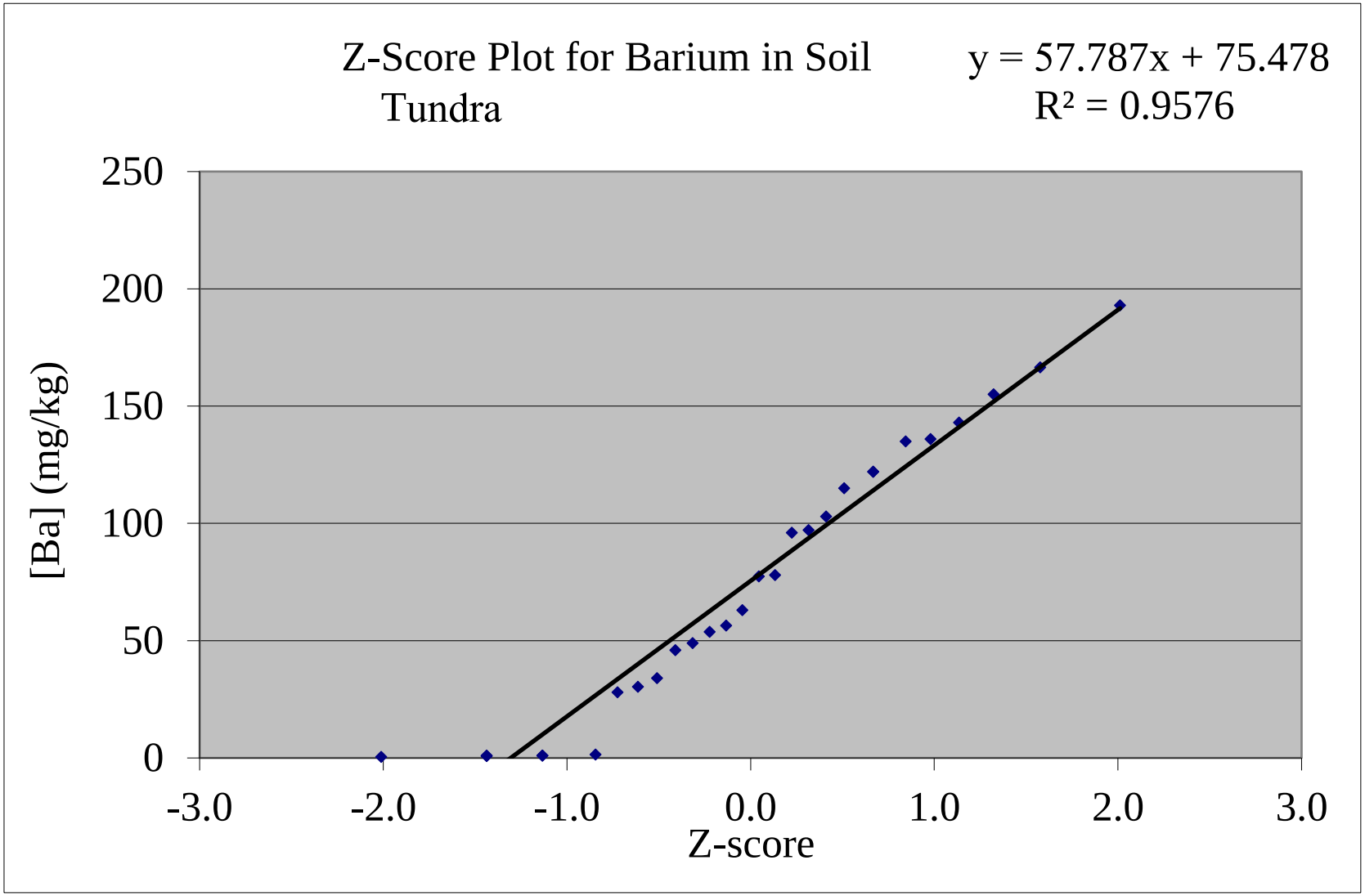
Attachment B - Statistical Probability Plots

Figure B-1.1
Probability Plot for Arsenic in Soil Tundra
Northeast Cape, St. Lawrence Island, Alaska



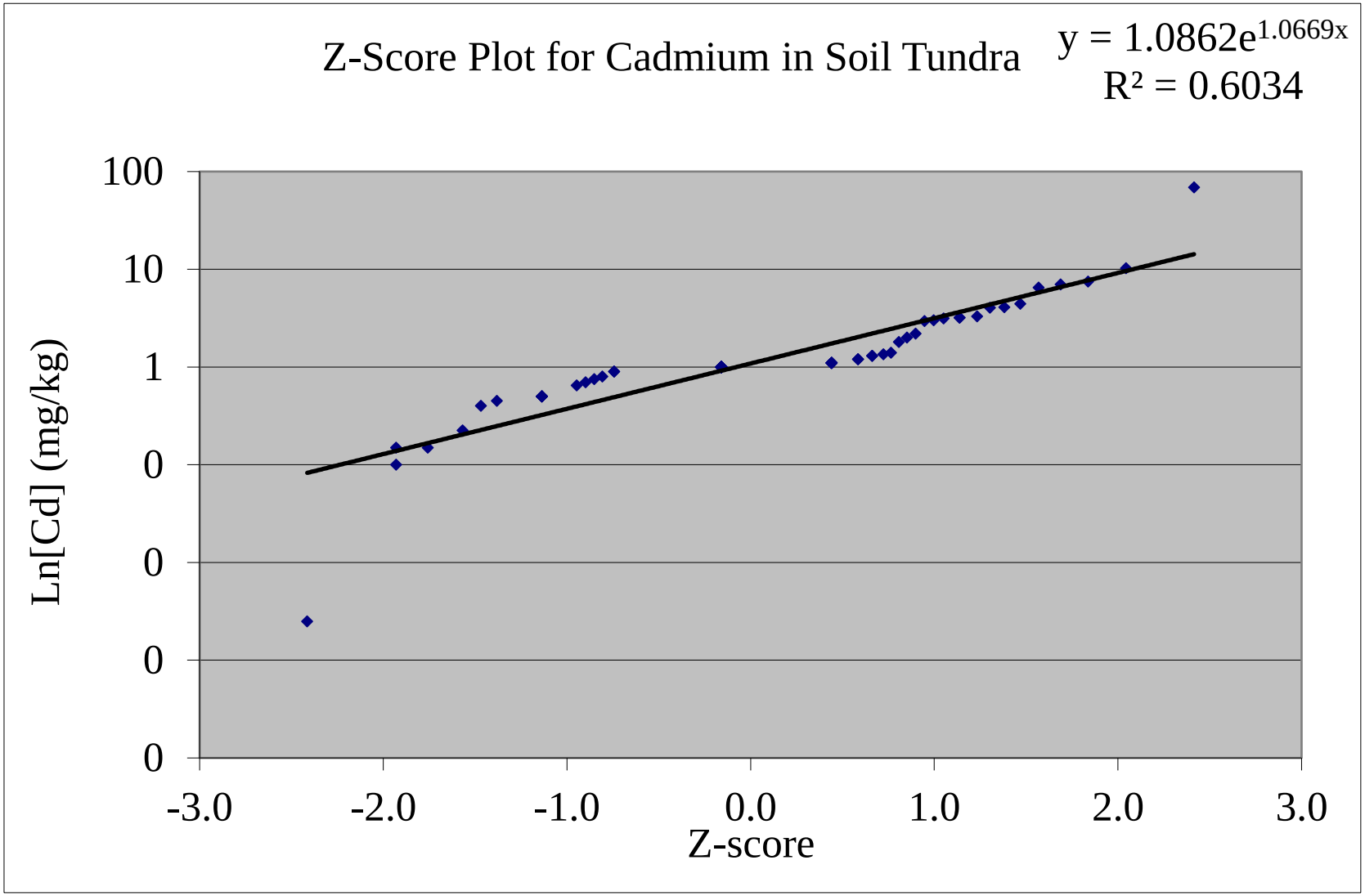
Conclusion: Visual inspection of the data resulted in an elimination of values greater than 7.9 mg/kg.

Figure B-1.2
Probability Plot for Barium in Soil Tundra
Northeast Cape, St. Lawrence Island, Alaska



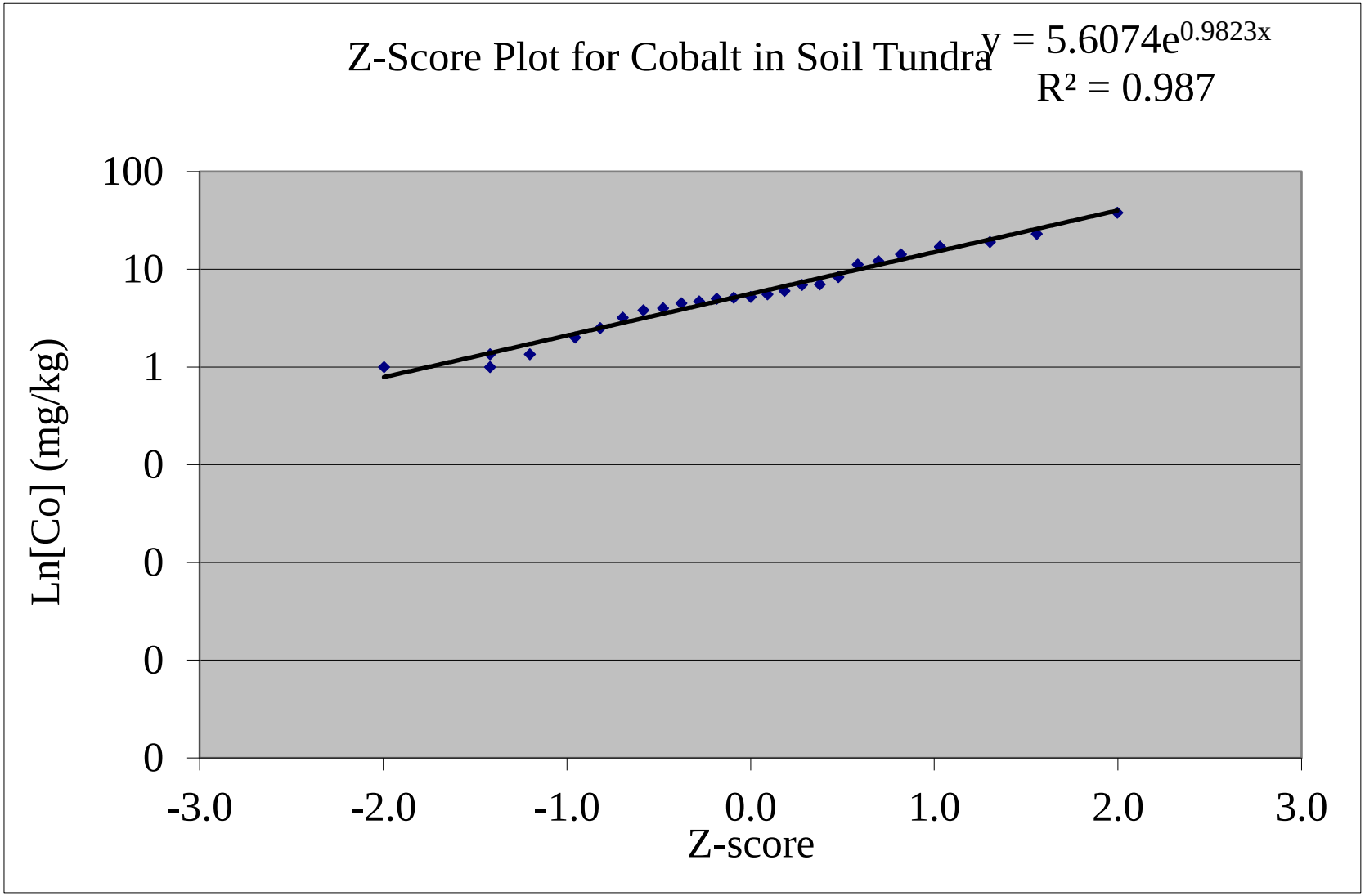
Conclusion: Visual inspection of the data resulted in windorizing the data for elimination of the 4 lowest and 4 highest values.

Figure B-1.3
Probability Plot for Cadmium in Soil Tundra
Northeast Cape, St. Lawrence Island, Alaska



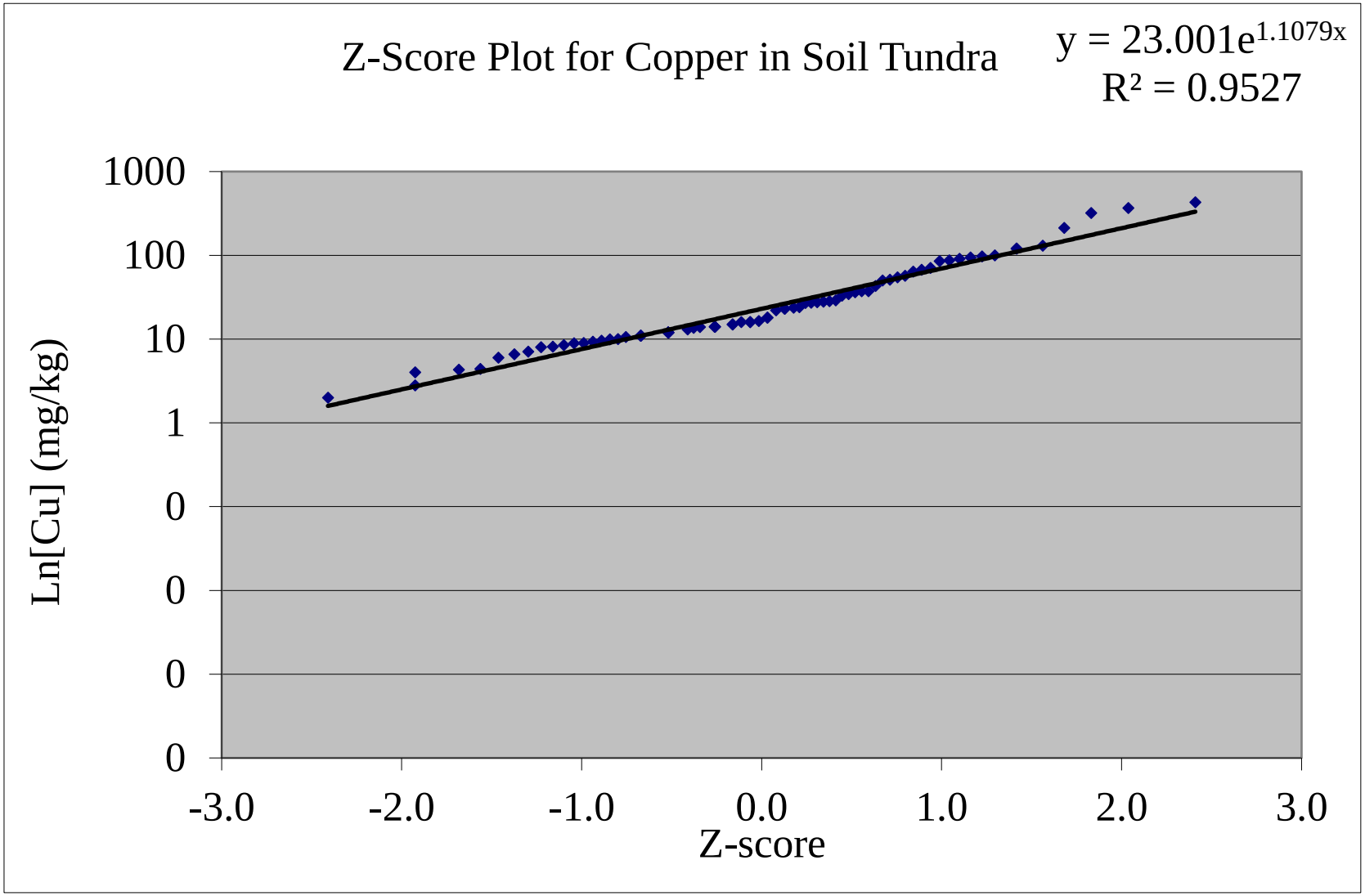
Conclusion: Visual inspection of the data resulted in an elimination of values equal to or greater than 1.8 and equal to or less than 0.225 mg/kg.

Figure B-1.4
Probability Plot for Cobalt in Soil Tundra
Northeast Cape, St. Lawrence Island, Alaska



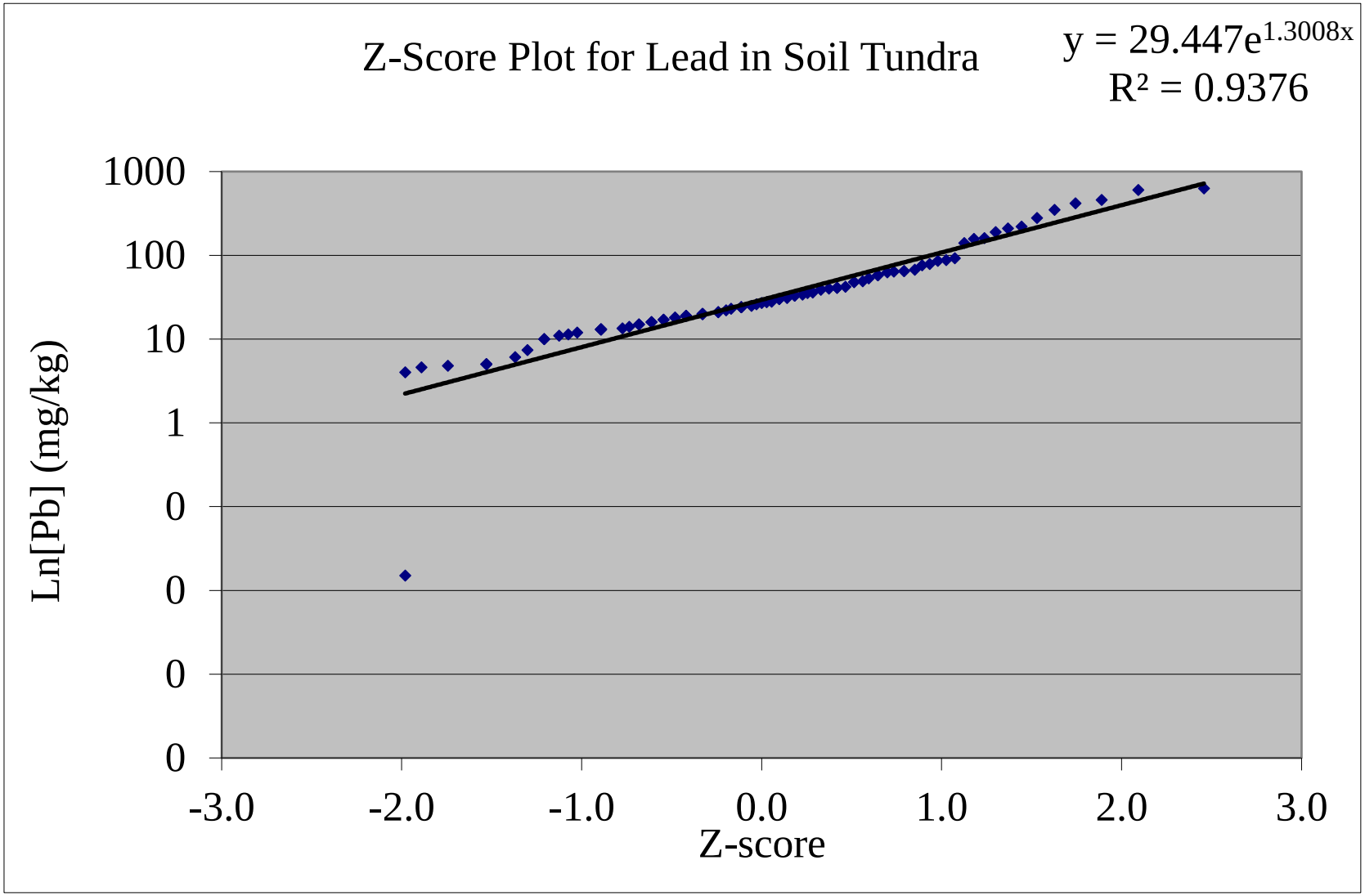
Conclusion: Visual inspection of the data does not indicate more than one data population is present.

Figure B-1.5
Probability Plot for Copper in Soil Tundra
Northeast Cape, St. Lawrence Island, Alaska



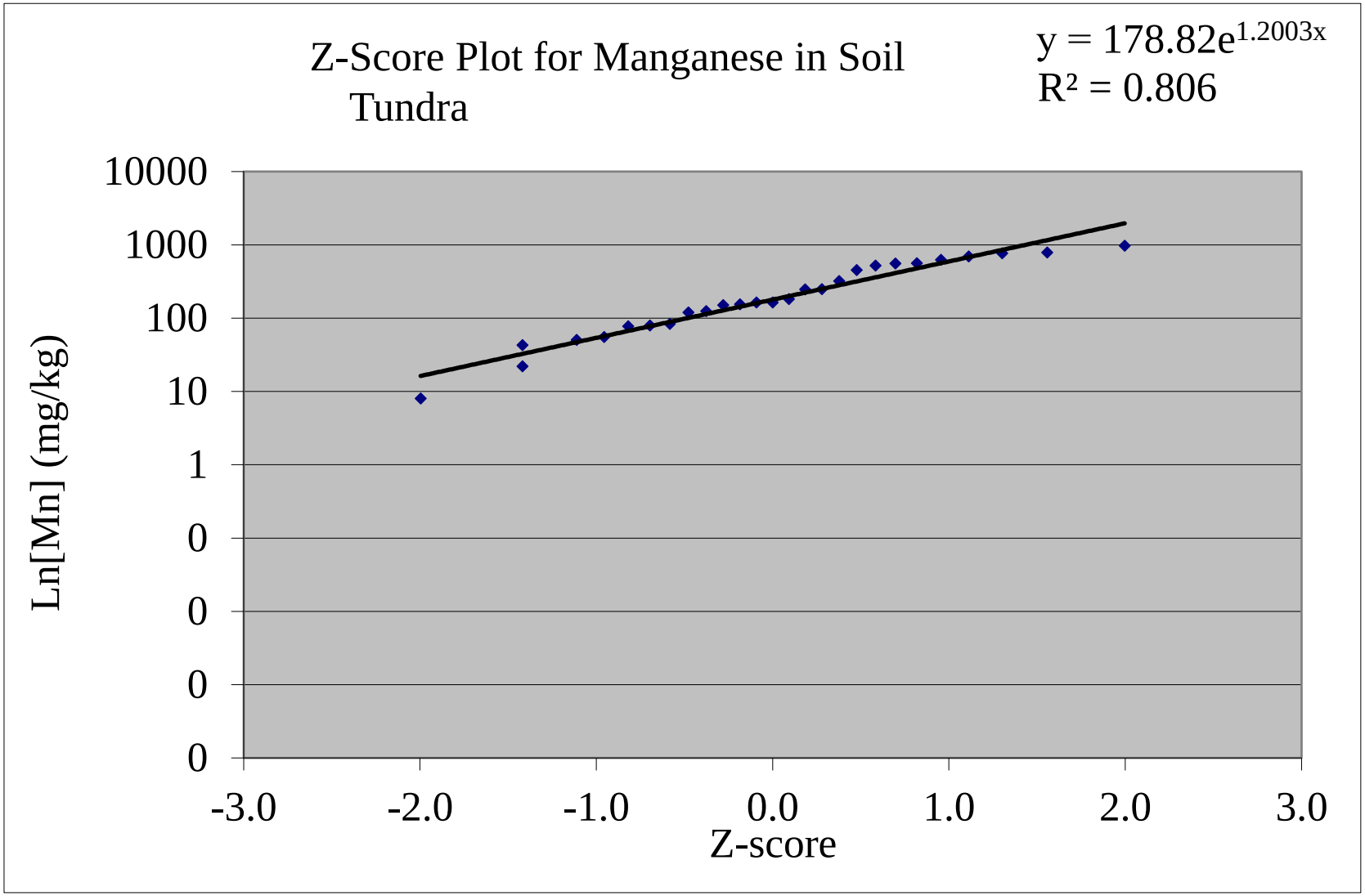
Conclusion: Visual inspection of the data resulted in an elimination of values greater than 100 mg/kg.

Figure B-1.6
Probability Plot for Lead in Soil Tundra
Northeast Cape, St. Lawrence Island, Alaska



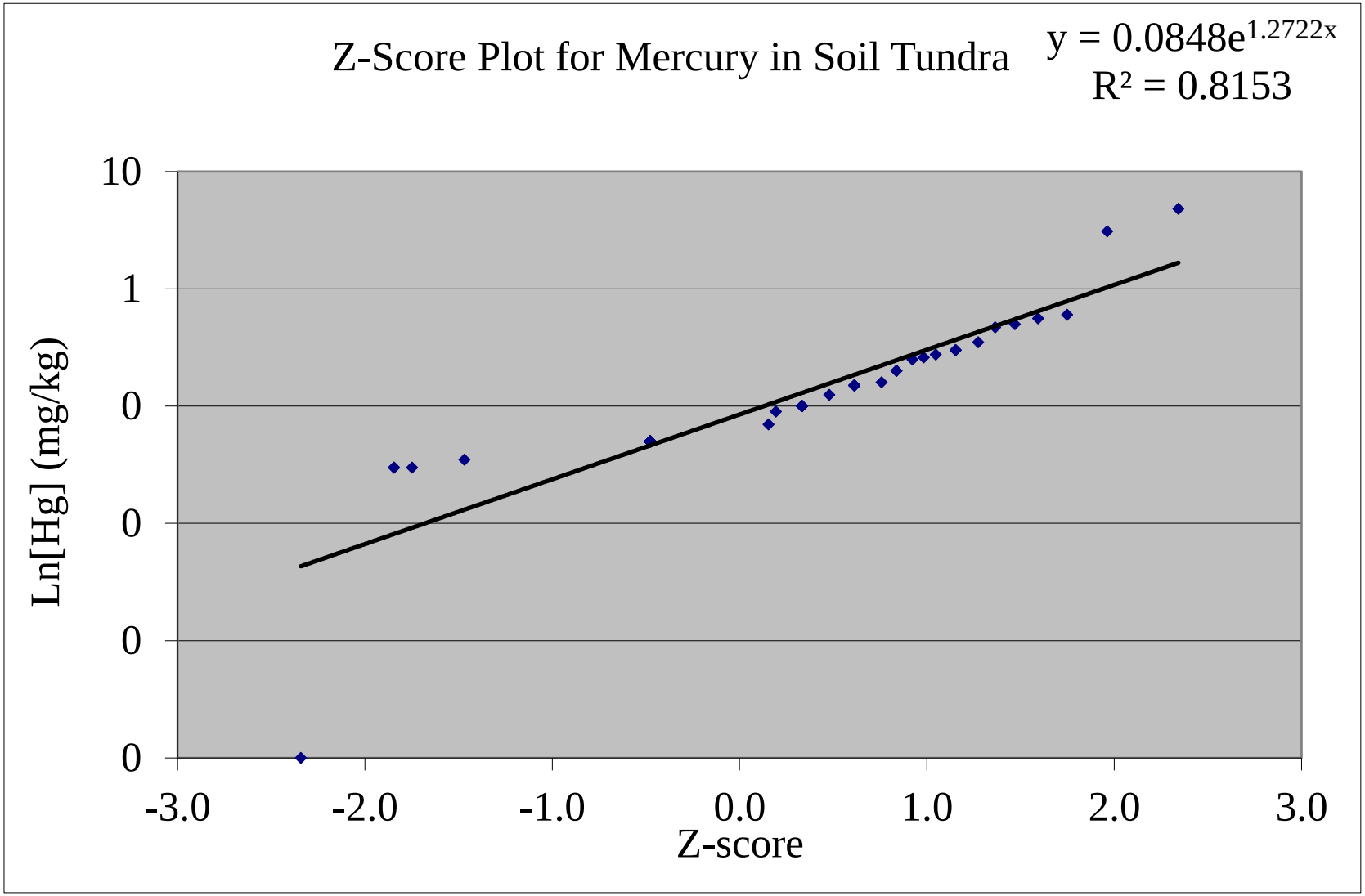
Conclusion: Visual inspection of the data resulted in an elimination of values greater than 92 mg/kg.

Figure B-1.7
Probability Plot for Manganese in Soil Tundra
Northeast Cape, St. Lawrence Island, Alaska



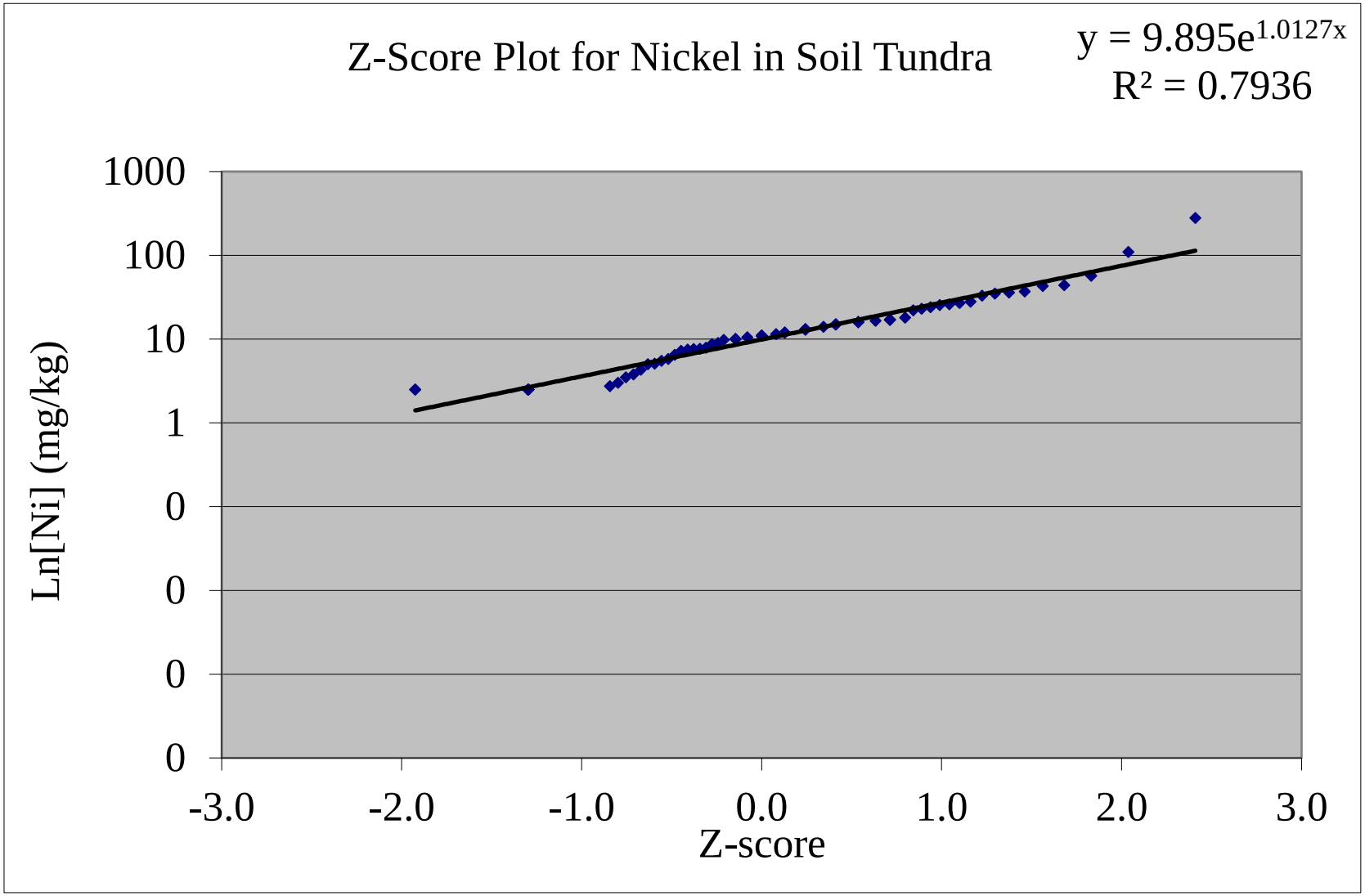
Conclusion: Visual inspection of the data resulted in windorizing the data for elimination of the 2 lowest and 2 highest values.

Figure B-1.8
Probability Plot for Mercury in Soil Tundra
Northeast Cape, St. Lawrence Island, Alaska



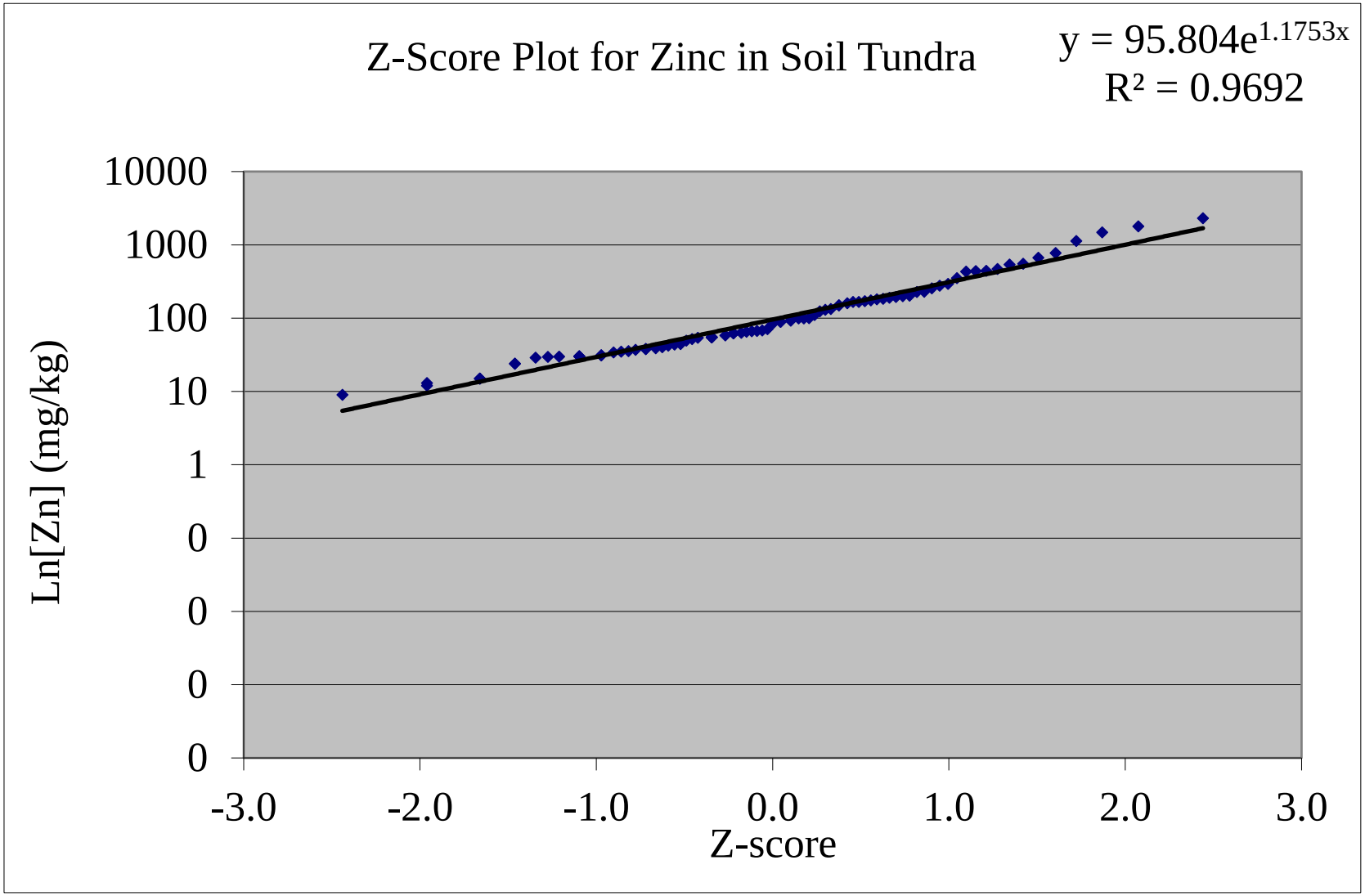
Conclusion: Visual inspection of the data does not indicate more than one data population is present.

Figure B-1.9
Probability Plot for Nickel in Soil Tundra
Northeast Cape, St. Lawrence Island, Alaska



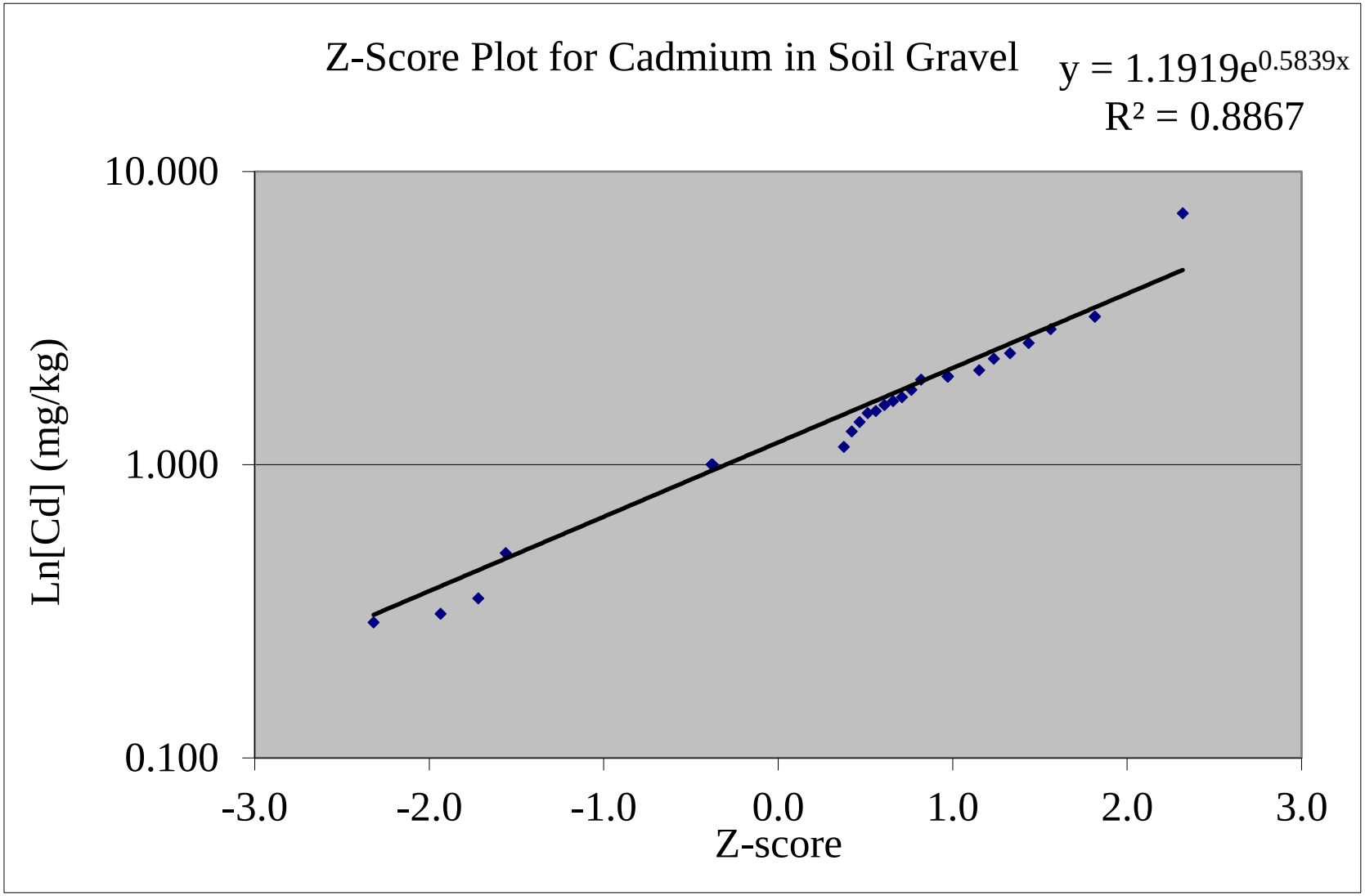
Conclusion: Visual inspection of the data does not indicate more than one data population is present.

Figure B-1.10
Probability Plot for Zinc in Soil Tundra
Northeast Cape, St. Lawrence Island, Alaska



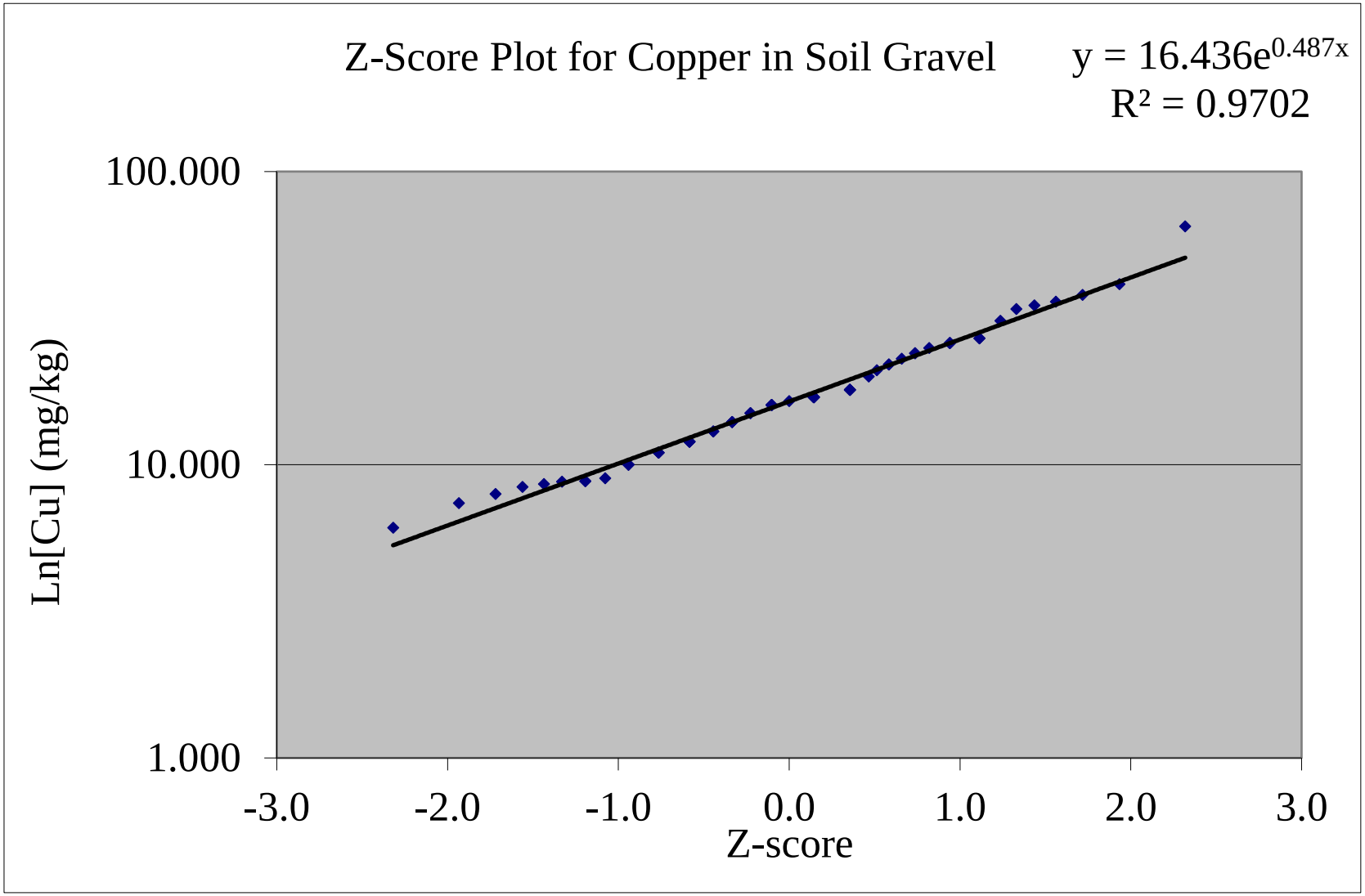
Conclusion: Visual inspection of the data resulted in an elimination of values greater than 776 mg/kg.

Figure B-2.1
Probability Plot for Cadmium in Soil Gravel
Northeast Cape, St. Lawrence Island, Alaska



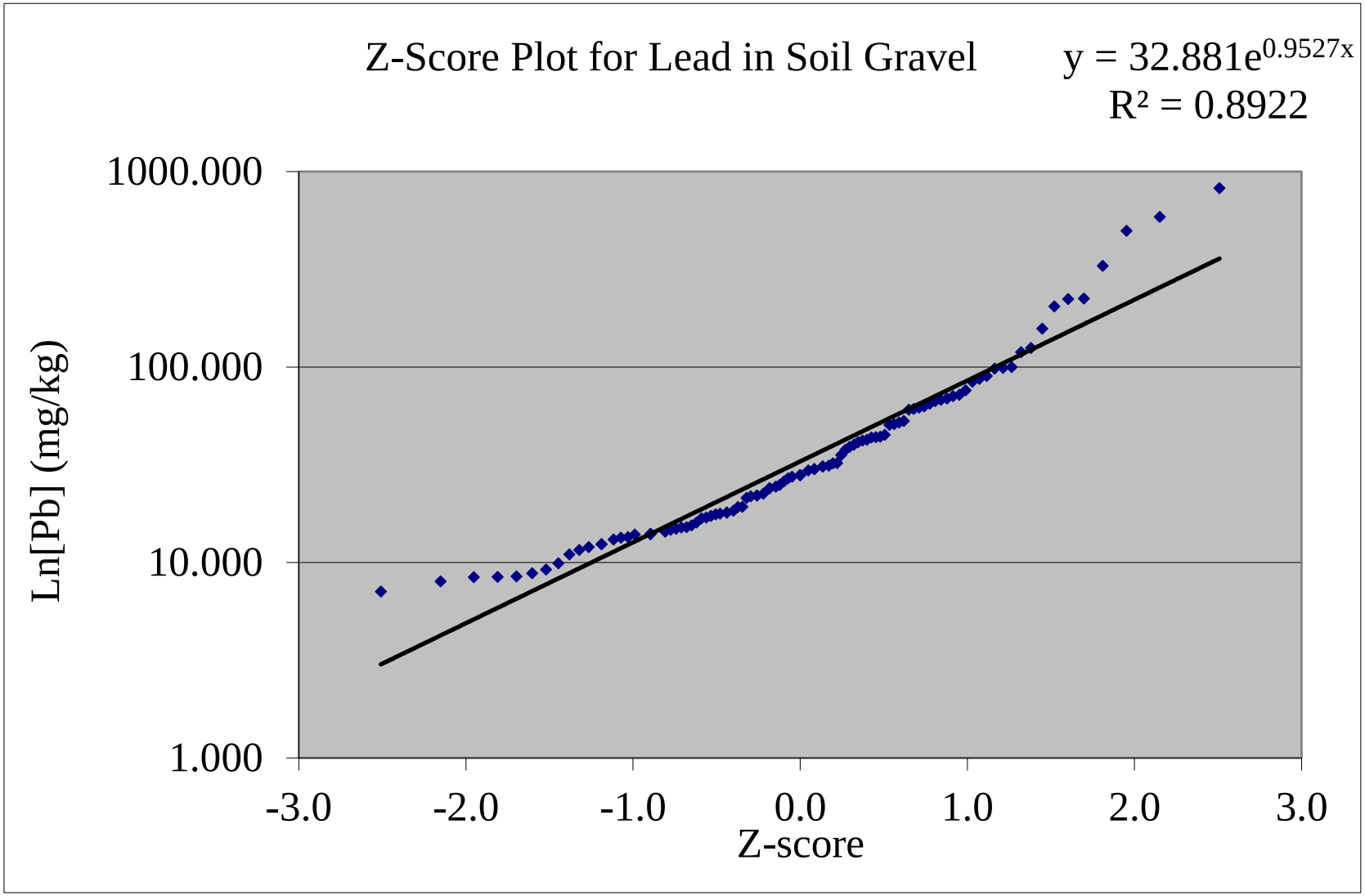
Conclusion: Visual inspection of the data does not indicate more than one data population is present.

Figure B-2.2
Probability Plot for Copper in Soil Gravel
Northeast Cape, St. Lawrence Island, Alaska



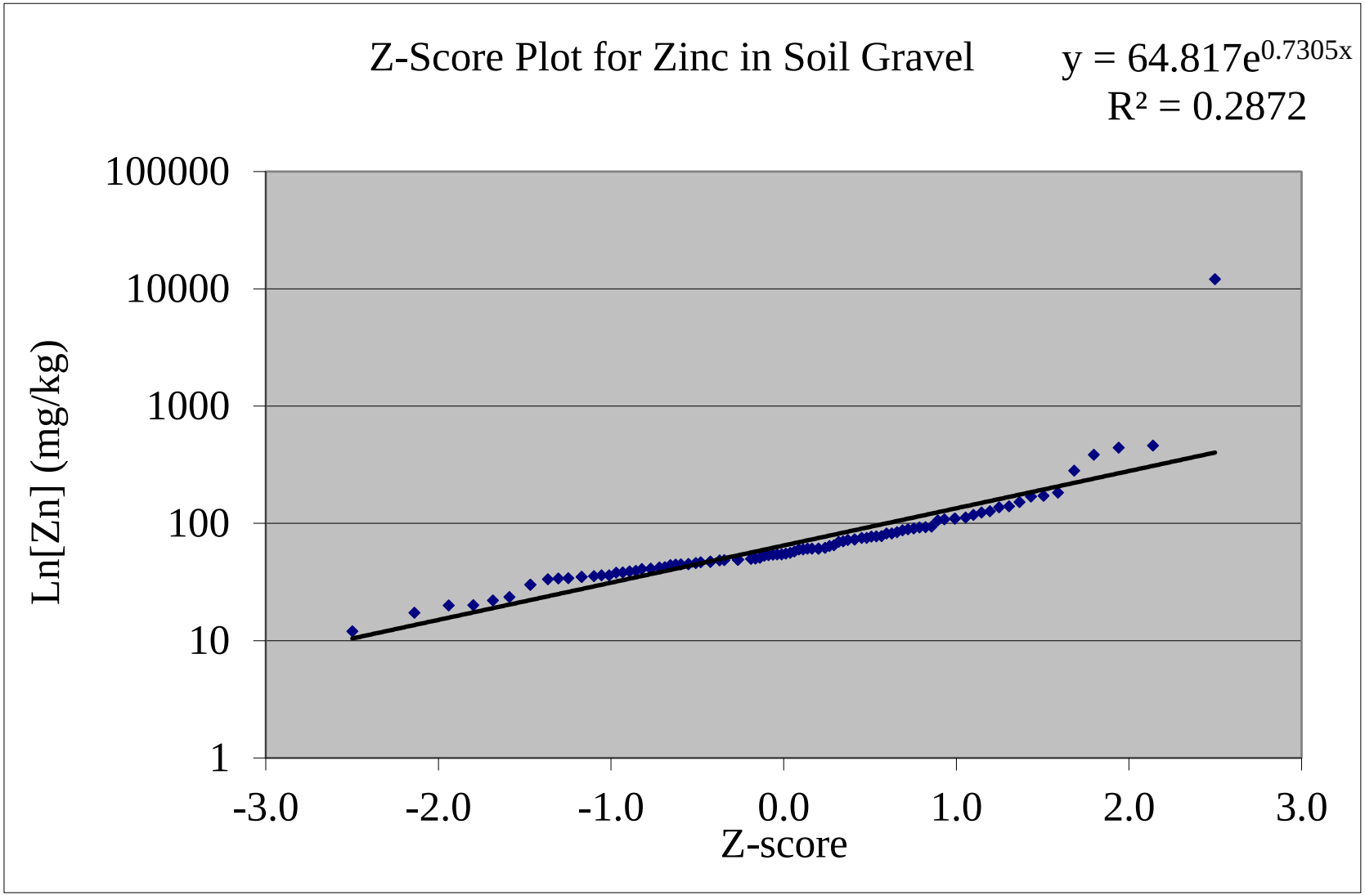
Conclusion: Visual inspection of the data does not indicate more than one data population is present.

Figure B-2.3
Probability Plot for Lead in Soil Gravel
Northeast Cape, St. Lawrence Island, Alaska



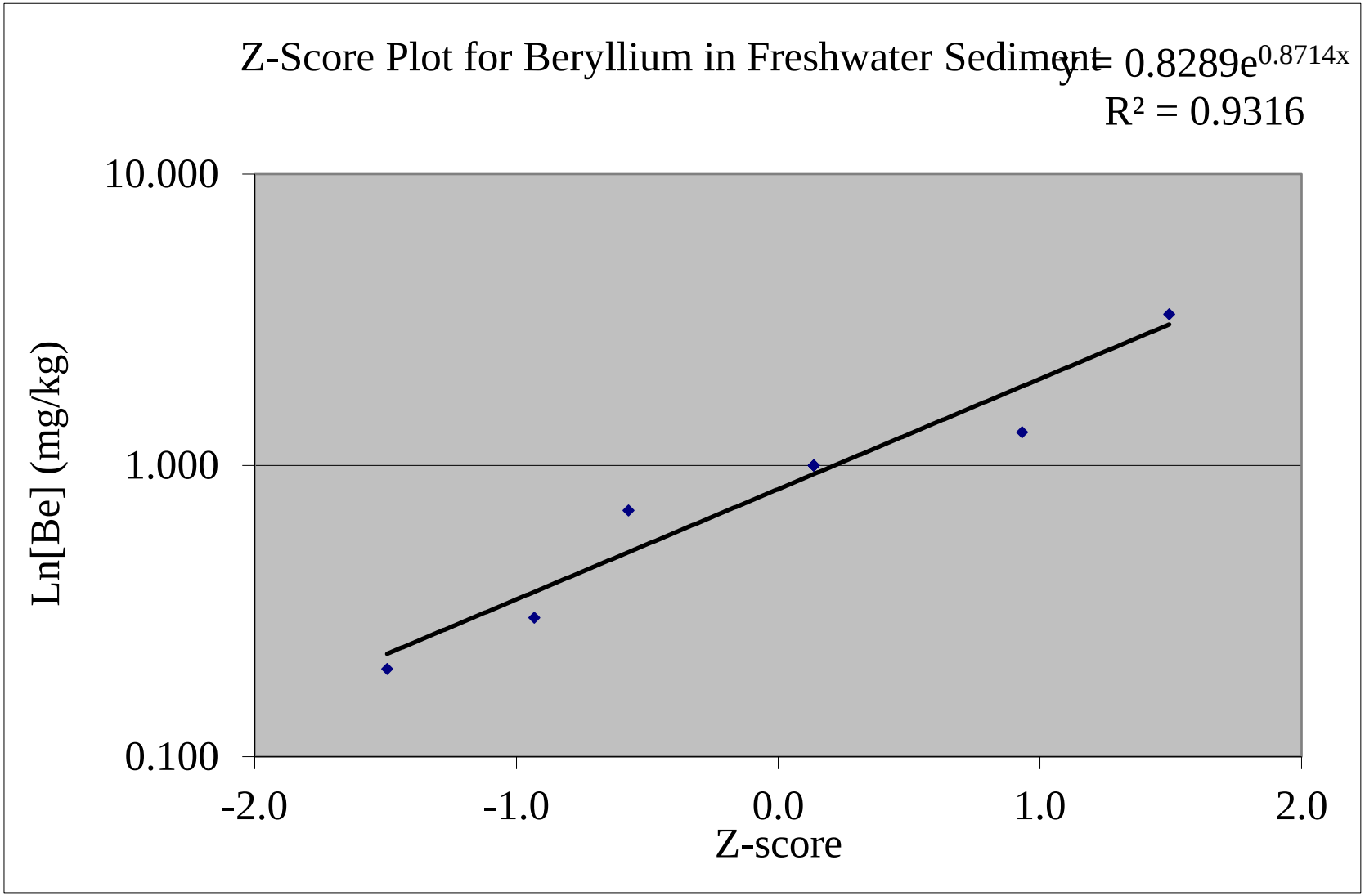
Conclusion: Visual inpsection of the data resulted in an elimination of values greater than 125 mg/kg.

Figure B-2.4
Probability Plot for Zinc in Soil Gravel
Northeast Cape, St. Lawrence Island, Alaska



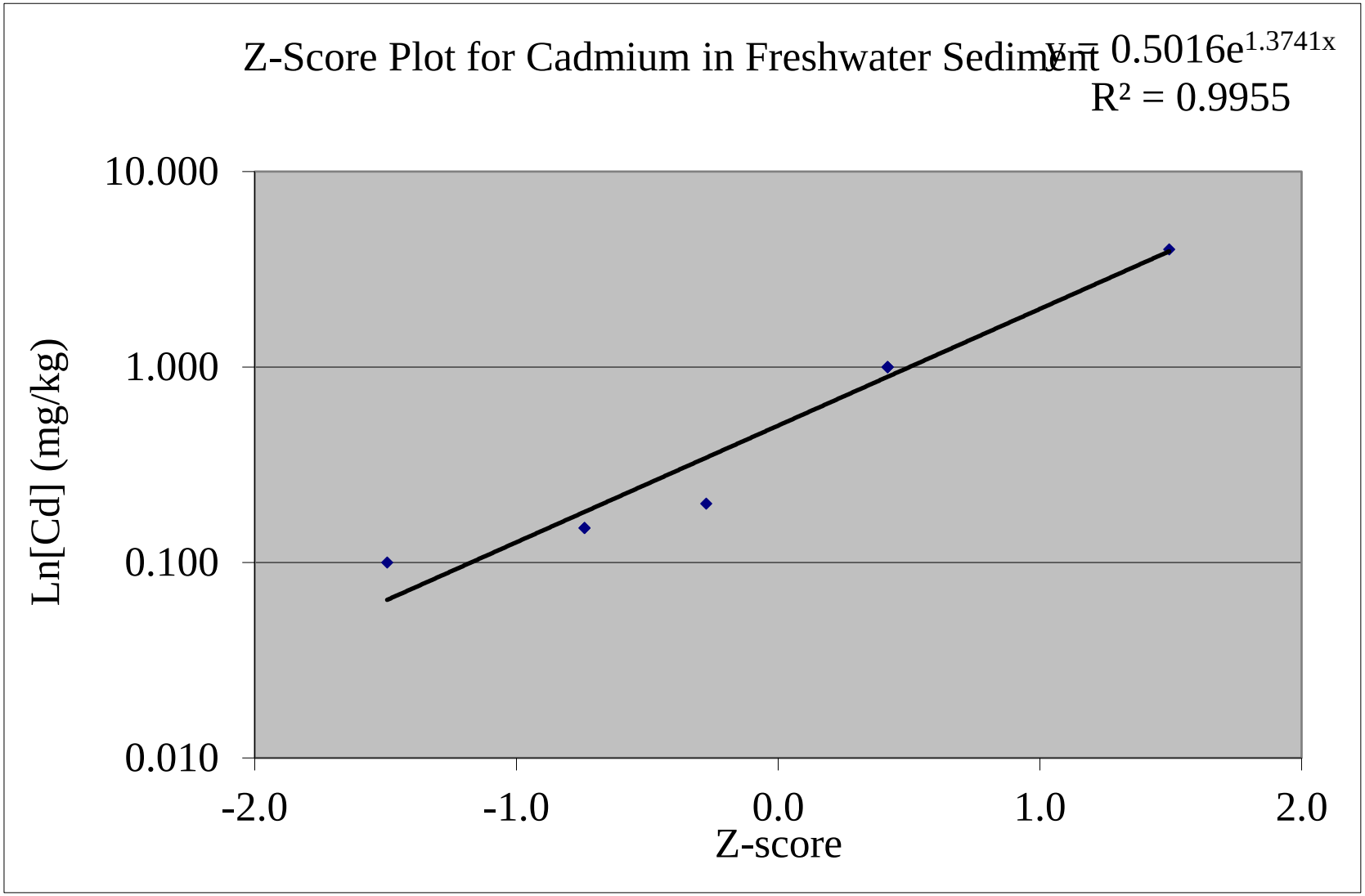
Conclusion: Visual inspection of the data resulted in an elimination of values greater than 183 mg/kg.

Figure B-3.1
Probability Plot for Beryllium in Freshwater Sediment
Northeast Cape, St. Lawrence Island, Alaska



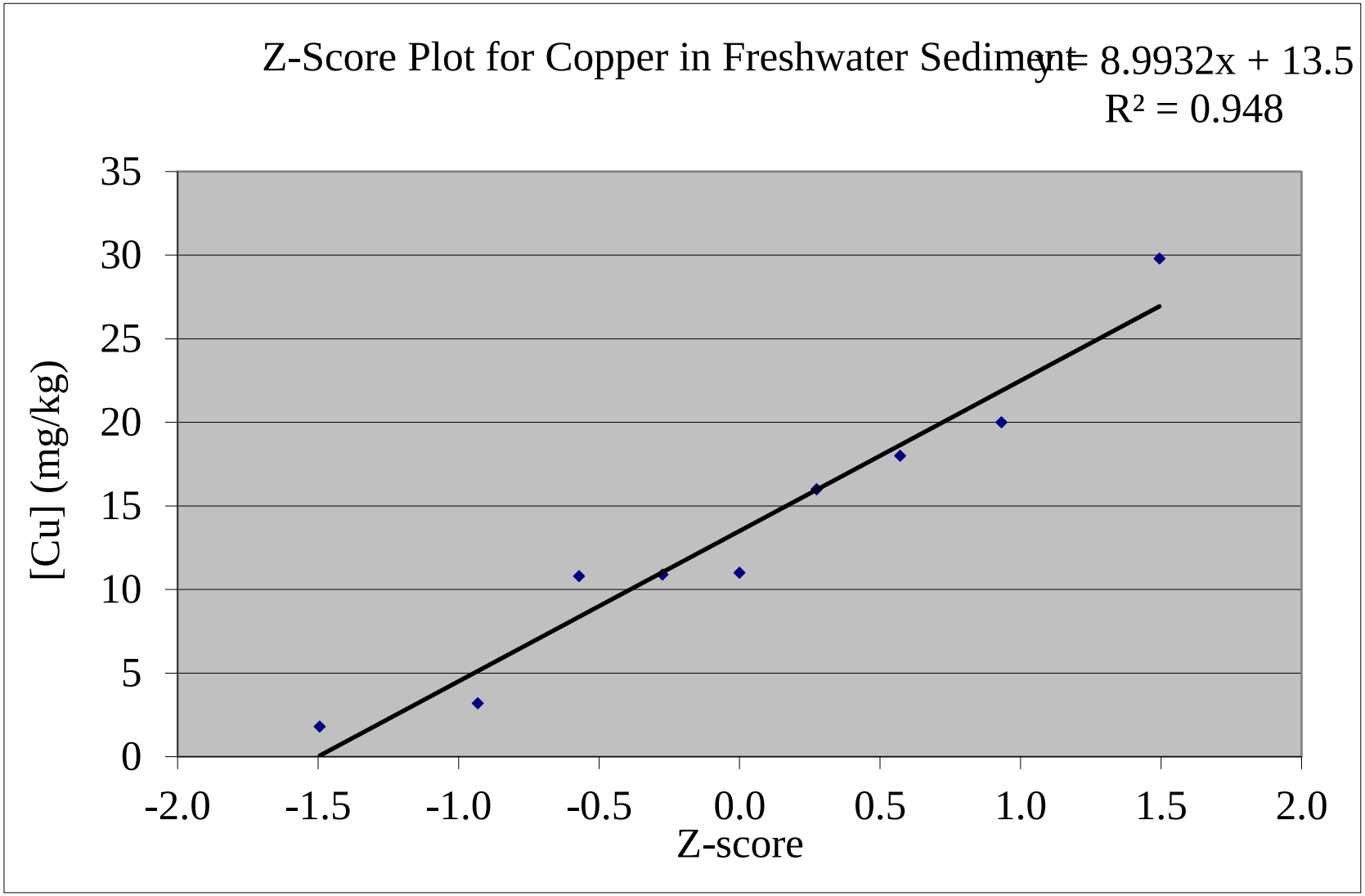
Conclusion: Insufficient data to determine whether or not more than one data population is present based on visual inspection of the probability plot.

Figure B-3.1
Probability Plot for Cadmium in Freshwater Sediment
Northeast Cape, St. Lawrence Island, Alaska



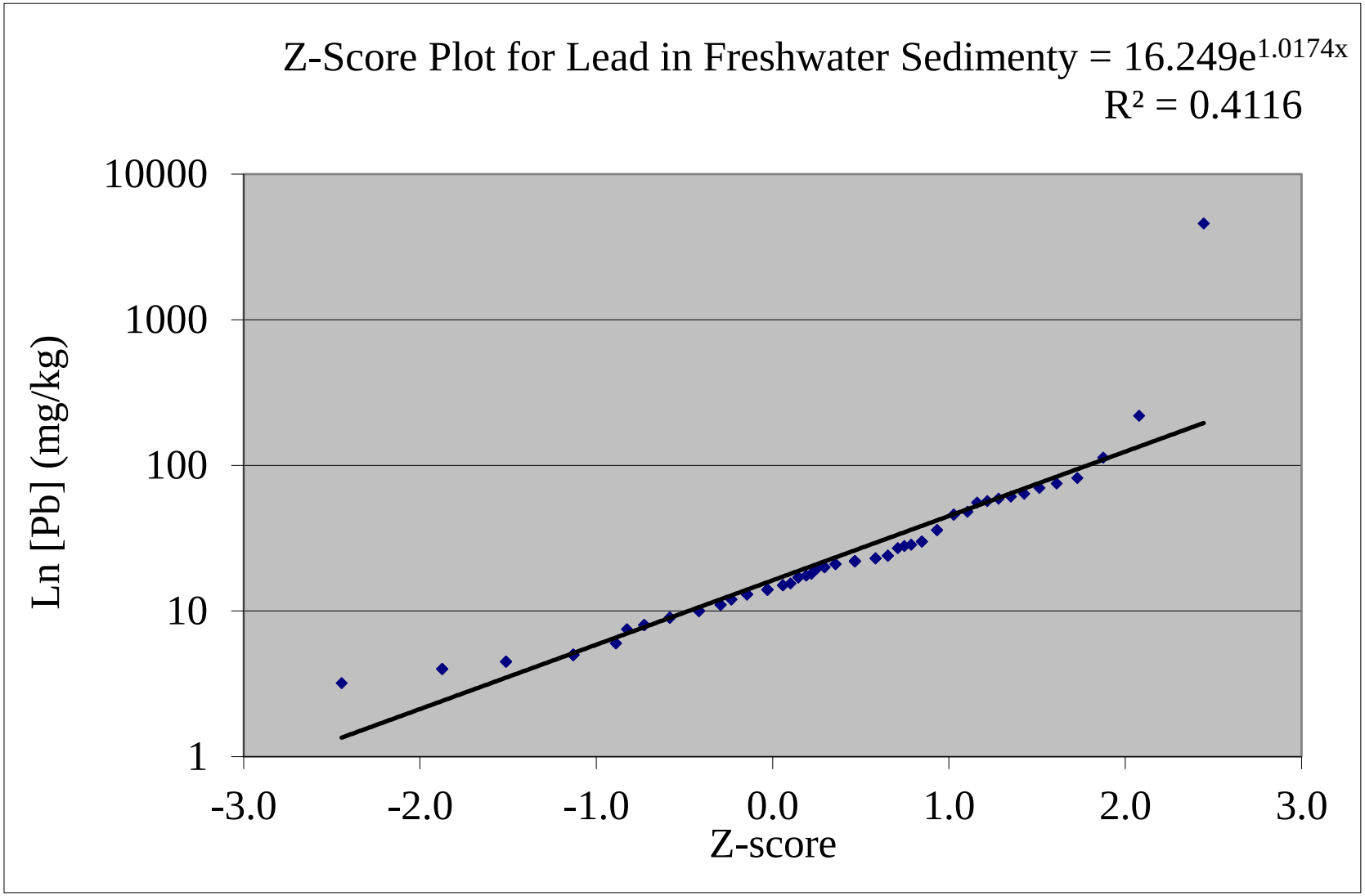
Conclusion: Insufficient data to calculate a 95/95 BUTL.

Figure B-3.2
Probability Plot for Copper in Freshwater Sediment
Northeast Cape, St. Lawrence Island, Alaska



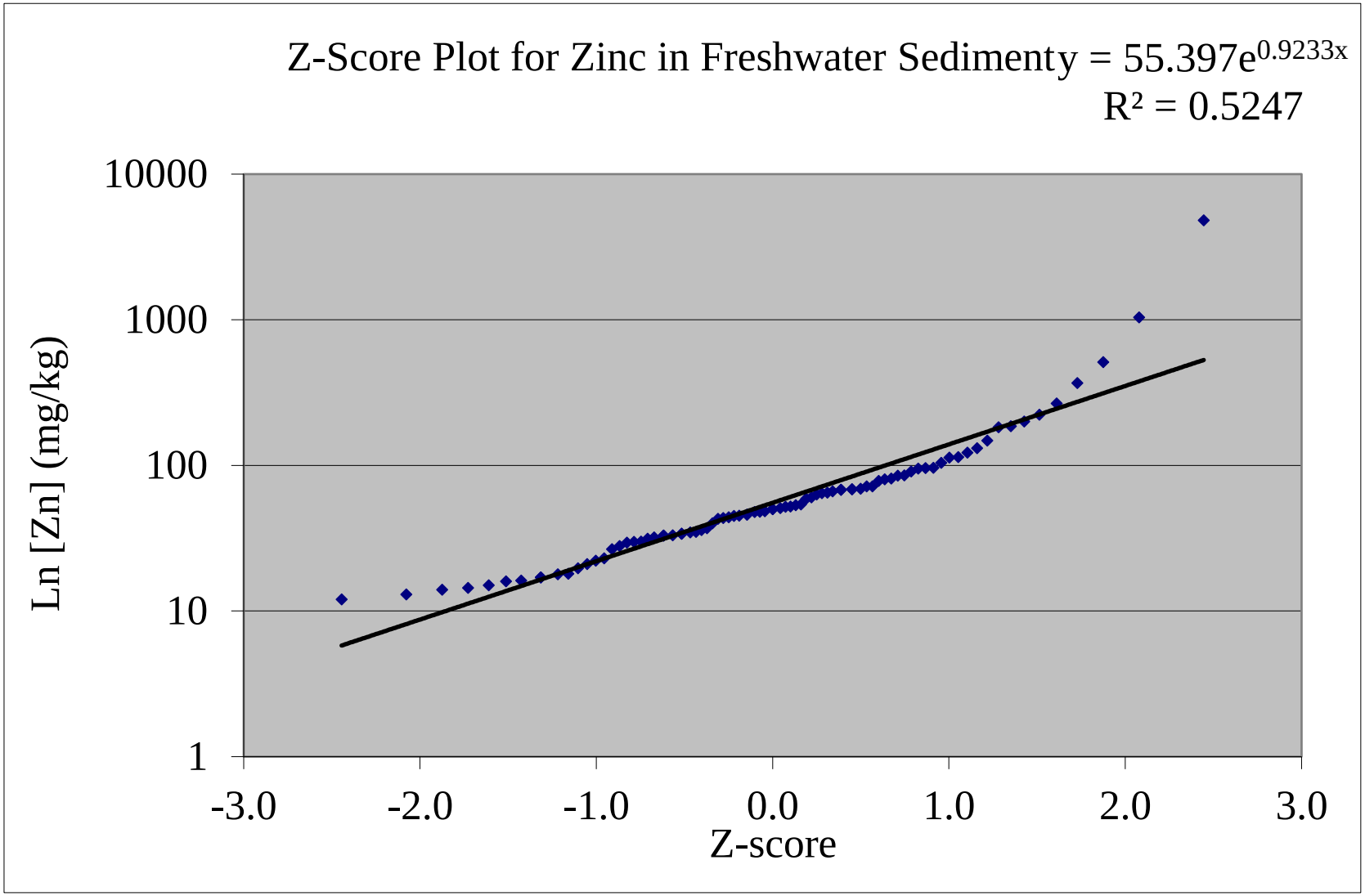
Conclusion: Insufficient data to determine whether or not more than one data population is present based on visual inspection of the probability plot.

Figure B-3.2
Probability Plot for Lead in Freshwater Sediment
Northeast Cape, St. Lawrence Island, Alaska



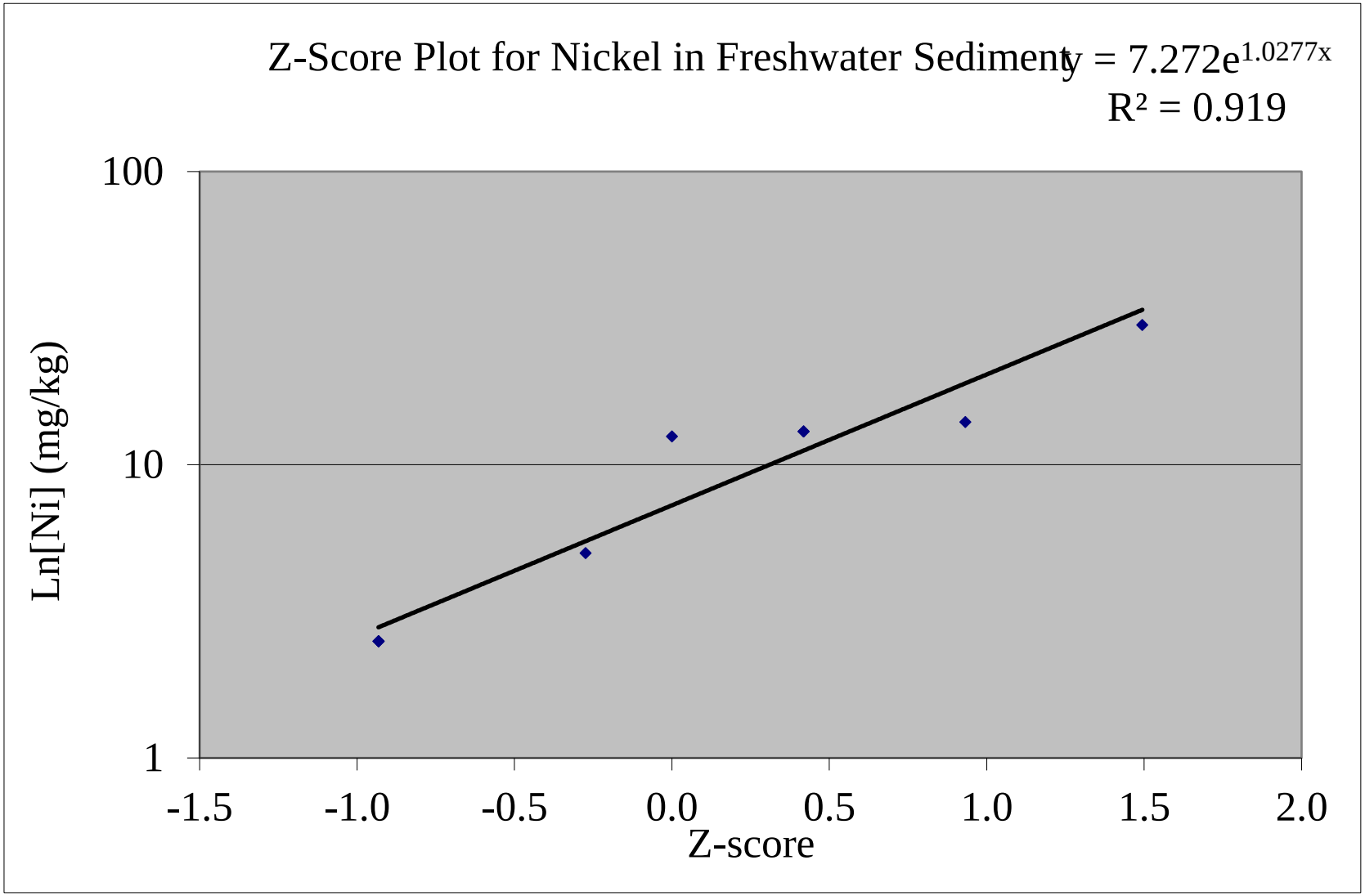
Conclusion: Visual inspection of the data resulted in an elimination of values greater than 113 mg/kg.

Figure B-3.2
Probability Plot for Zinc in Freshwater Sediment
Northeast Cape, St. Lawrence Island, Alaska



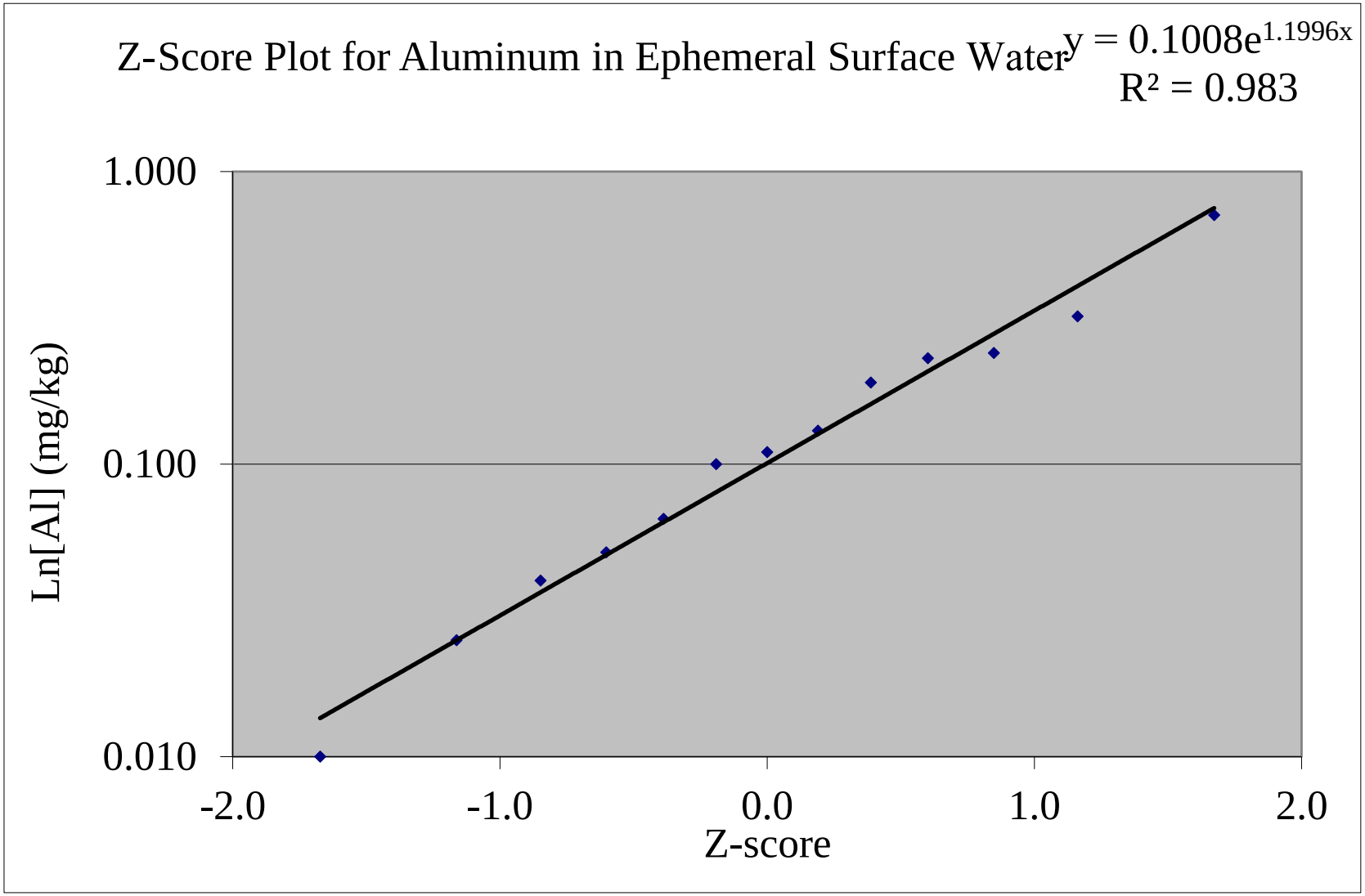
Conclusion: Visual inspection of the data resulted in an elimination of values greater than 148 mg/kg.

Figure B-3.3
Probability Plot for Nickel in Freshwater Sediment
Northeast Cape, St. Lawrence Island, Alaska



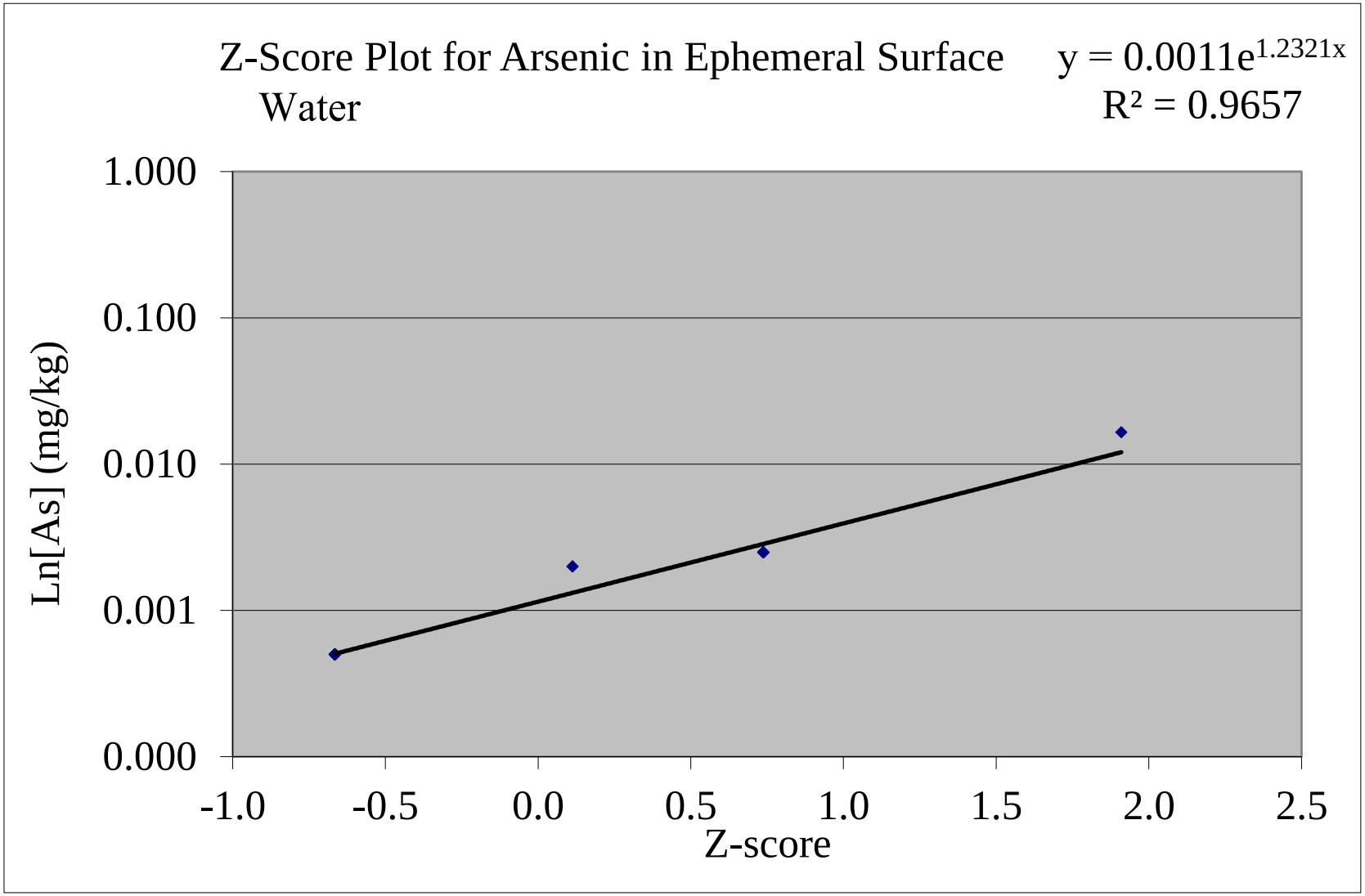
Conclusion: Insufficient data to determine whether or not more than one data population is present based on visual inspection of the probability plot.

Figure B-4.1
Probability Plot for Aluminum in Ephemeral Surface Water
Northeast Cape, St. Lawrence Island, Alaska



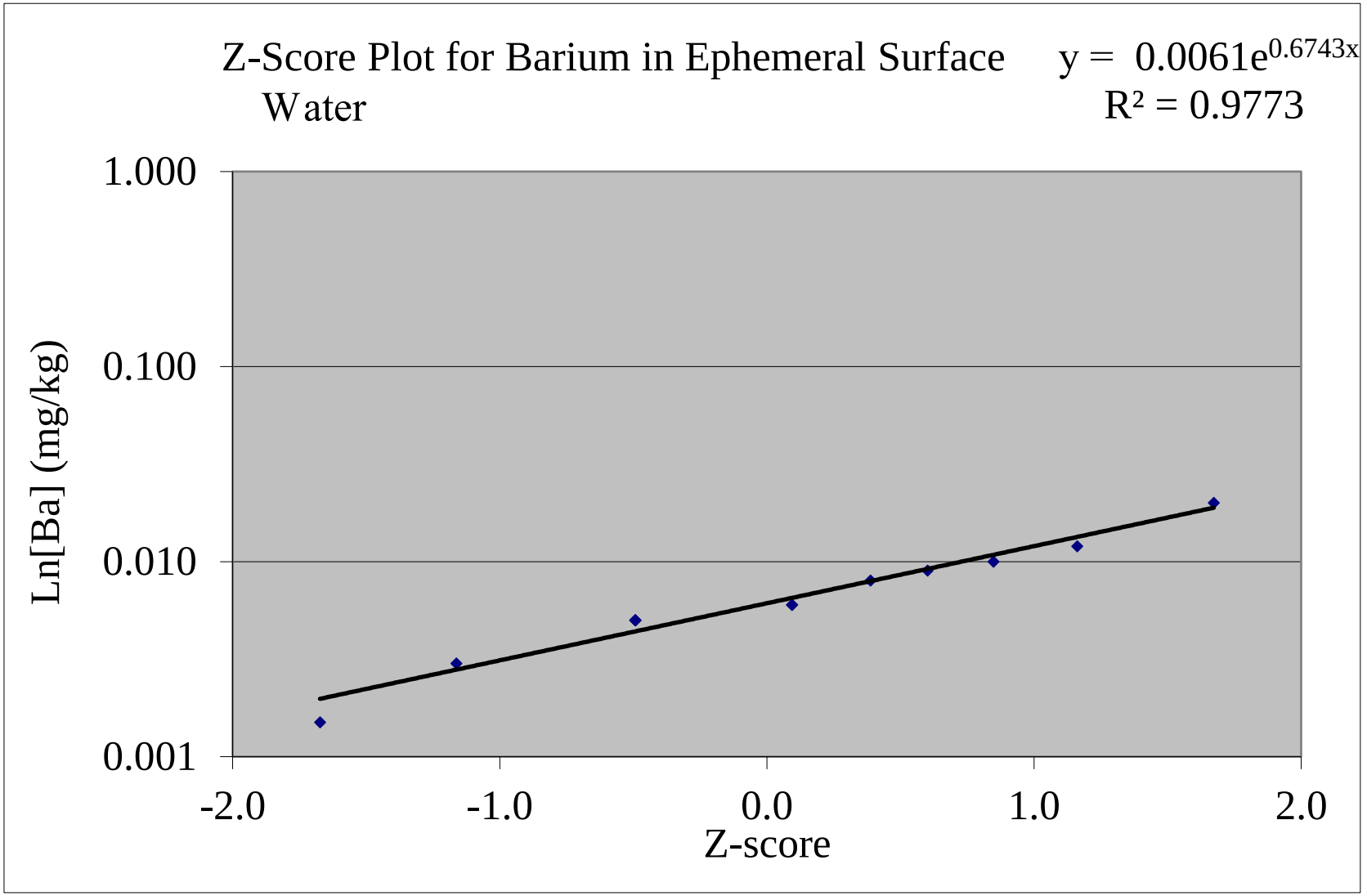
Conclusion: Visual inspection of the data does not indicate more than one data population is present.

Figure B-4.2
Probability Plot for Arsenic in Ephemeral Surface Water
Northeast Cape, St. Lawrence Island, Alaska



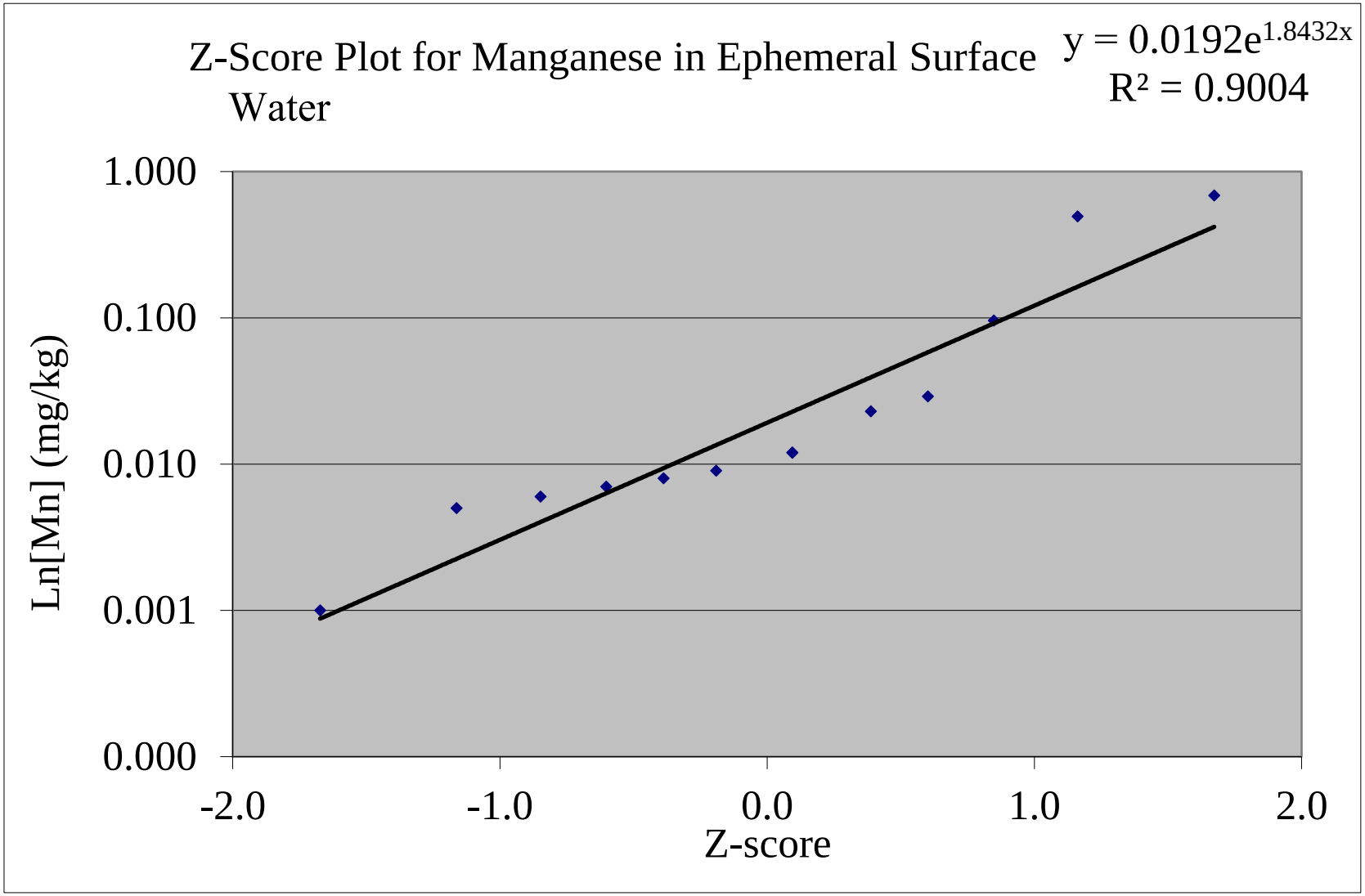
Conclusion: Visual inpsection of the data indicates insufficient data to calculate a 95/95 BUTL.

Figure B-4.3
Probability Plot for Barium in Ephemeral Surface Water
Northeast Cape, St. Lawrence Island, Alaska



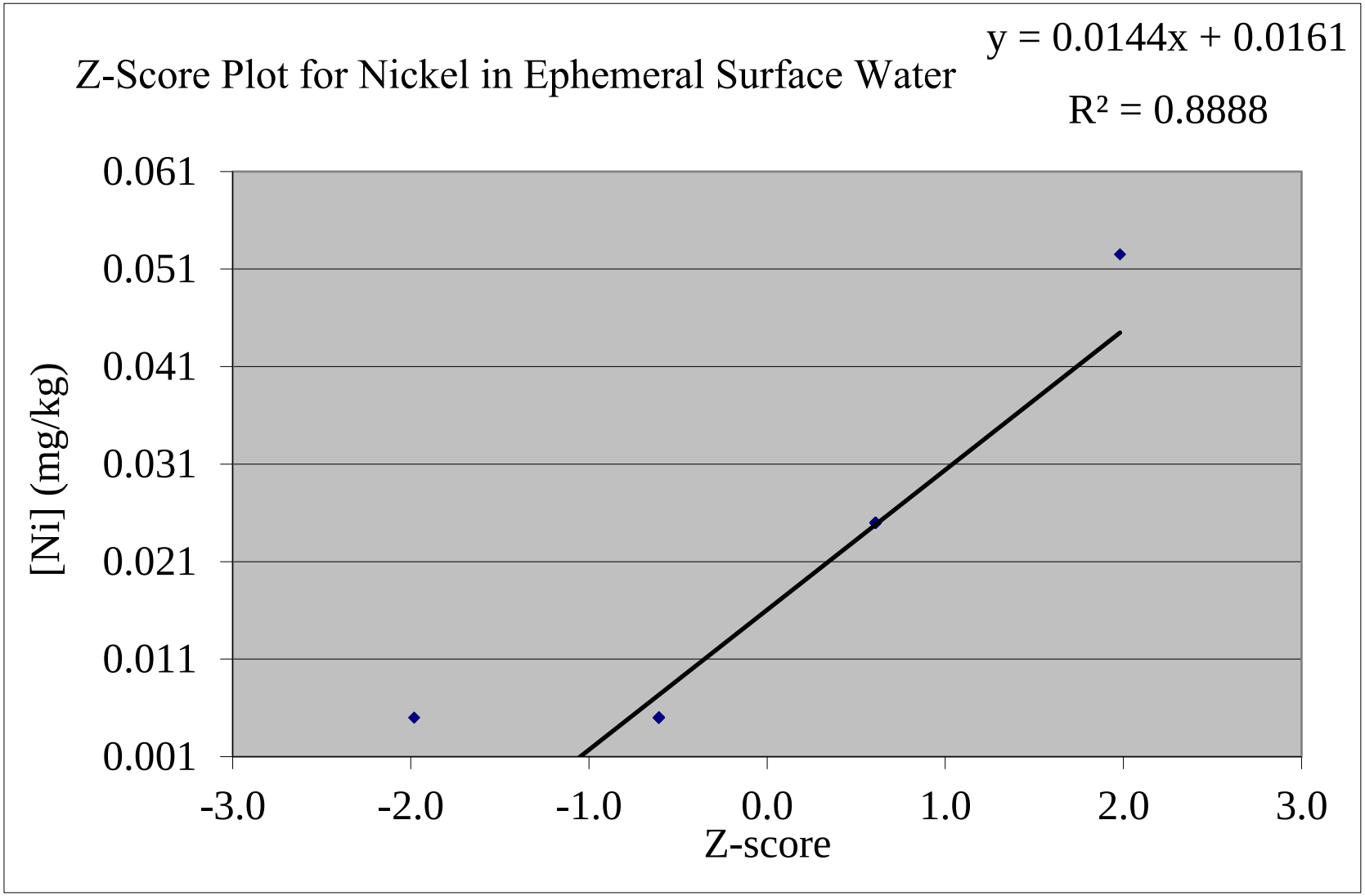
Conclusion: Visual inspection of the data does not indicate more than one data population is present.

Figure B-4.4
Probability Plot for Manganese in Ephemeral Surface Water
Northeast Cape, St. Lawrence Island, Alaska



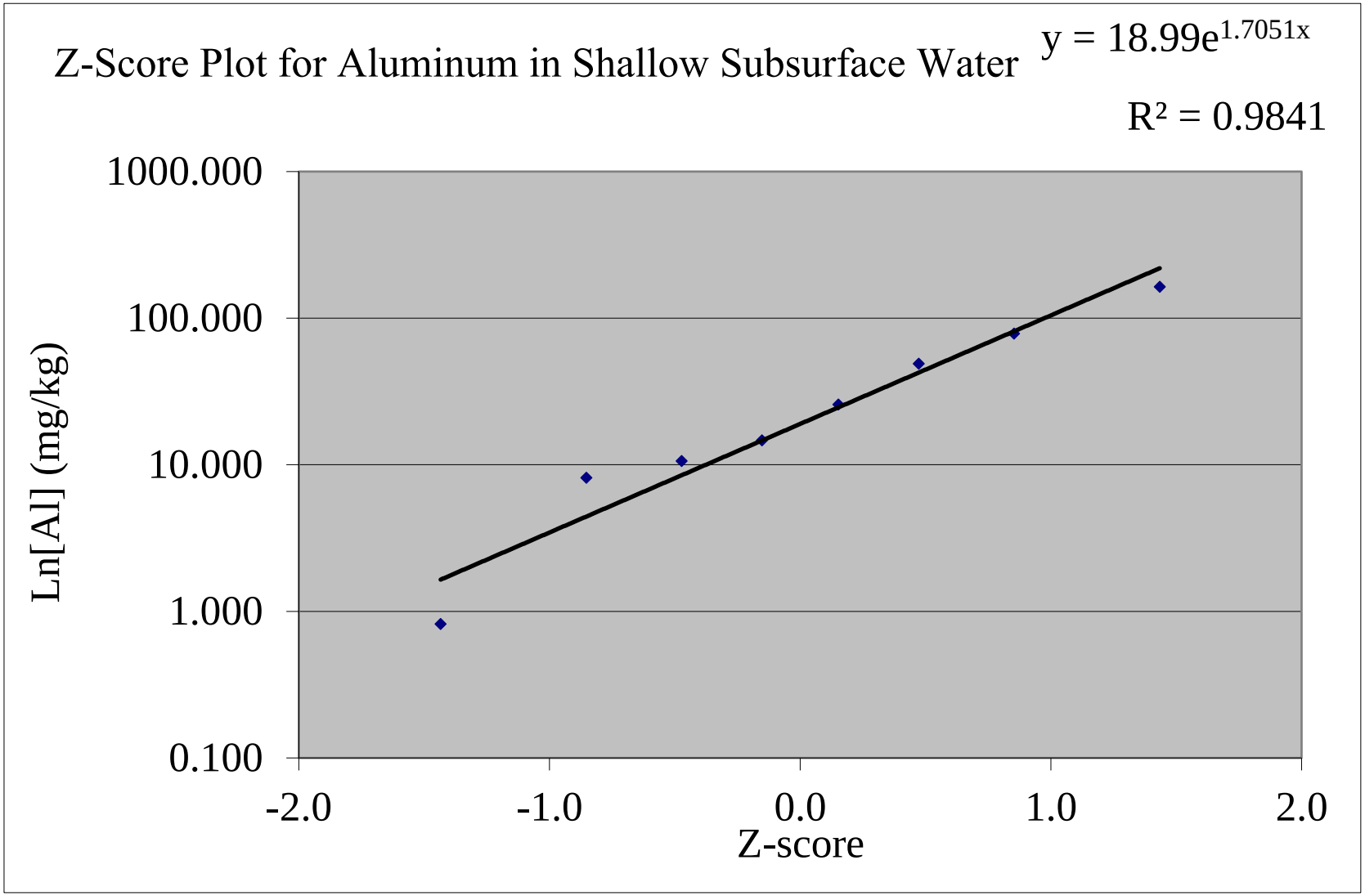
Conclusion: Visual inspection of the data resulted in an elimination of values greater than 0.029 mg/L.

Figure B-4.5
Probability Plot for Nickel in Ephemeral Surface Water
Northeast Cape, St. Lawrence Island, Alaska



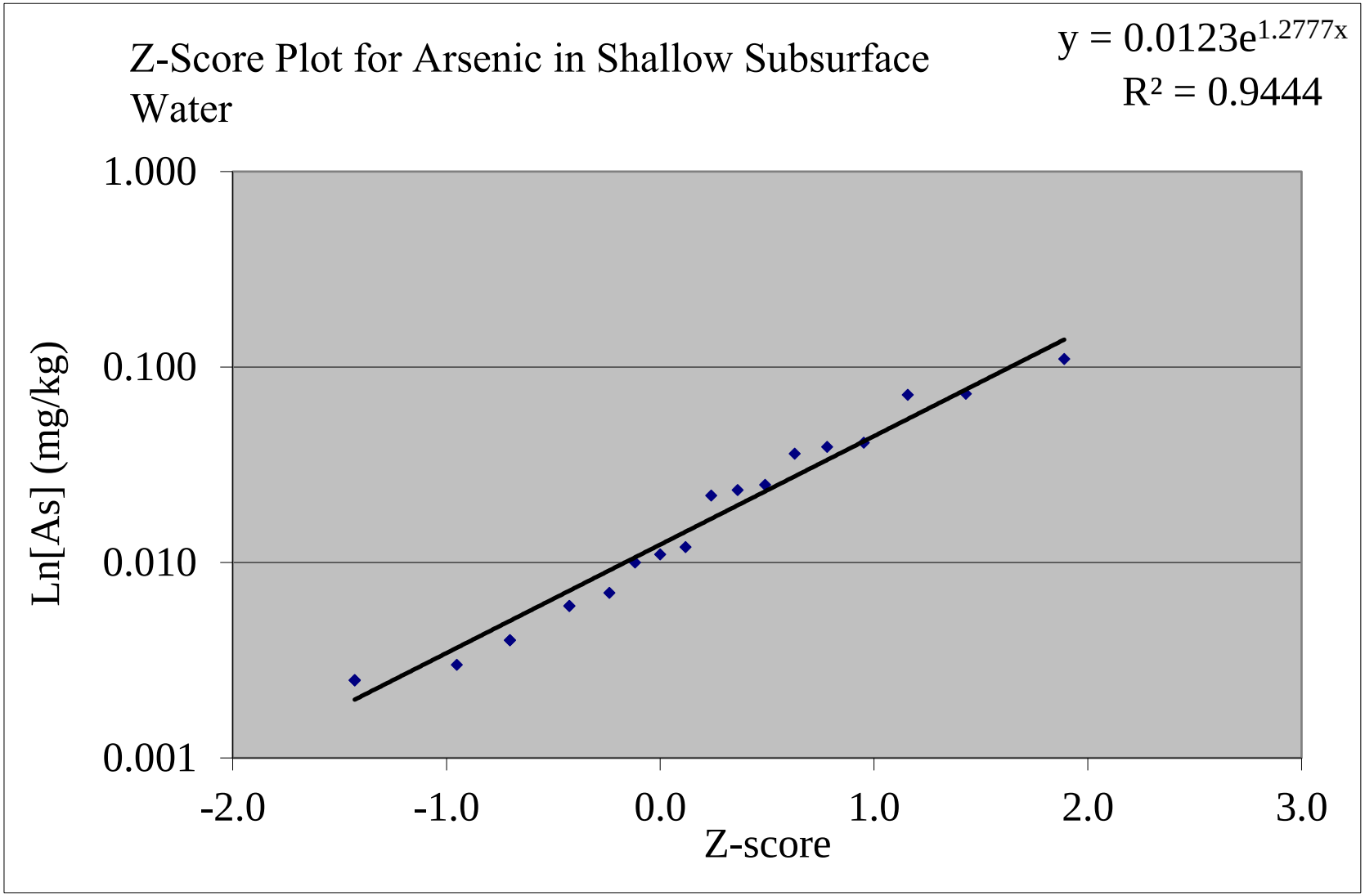
Conclusion: Visual inpsection of the data indicates insufficient data to calculate a 95/95 BUTL.

Figure B-5.1
Probability Plot for Aluminum in Shallow Subsurface Water
Northeast Cape, St. Lawrence Island, Alaska



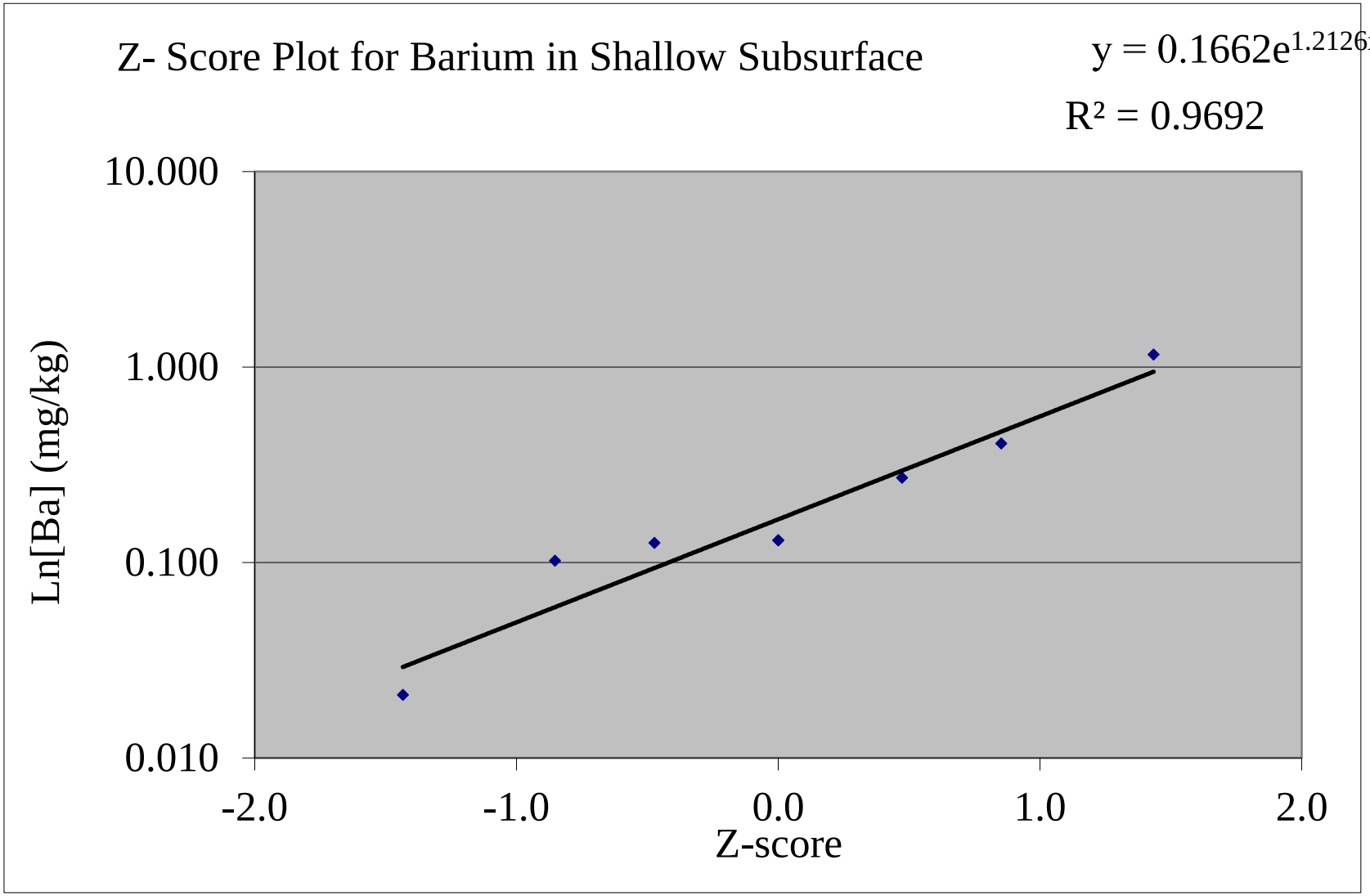
Conclusion: Visual inspection of the data indicates insufficient data to calculate a 95/95 BUTL.

Figure B-5.2
Probability Plot for Arsenic in Shallow Subsurface Water
Northeast Cape, St. Lawrence Island, Alaska



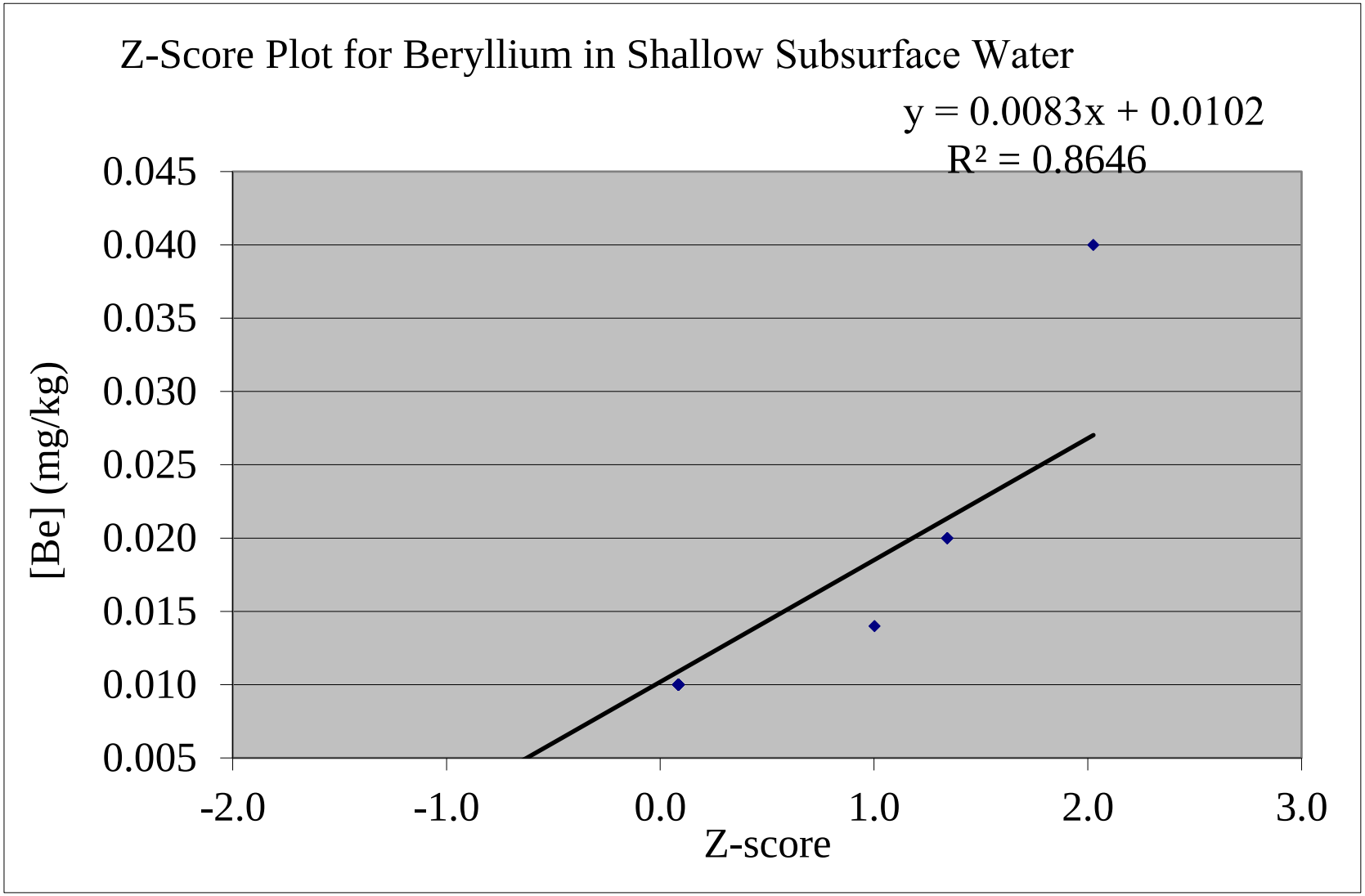
Conclusion: Visual inspection of the data resulted in an elimination of values greater than 0.012 mg/L.

Figure B-5.3
Probability Plot for Barium in Shallow Subsurface Water
Northeast Cape, St. Lawrence Island, Alaska



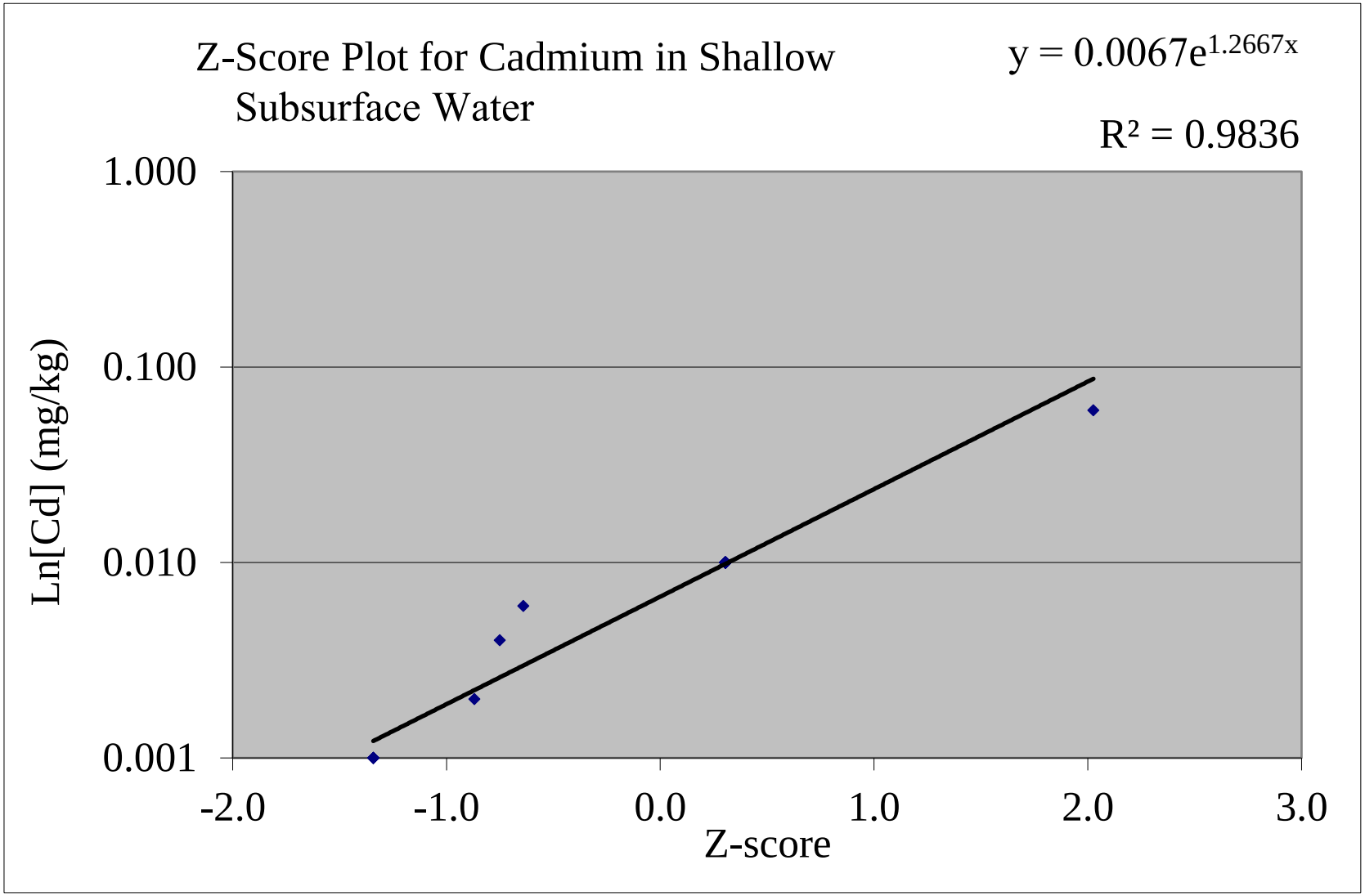
Conclusion: Visual inspection of the data indicates insufficient data to calculate a 95/95 BUTL.

Figure B-5.4
Probability Plot for Beryllium in Shallow Subsurface Water
Northeast Cape, St. Lawrence Island, Alaska



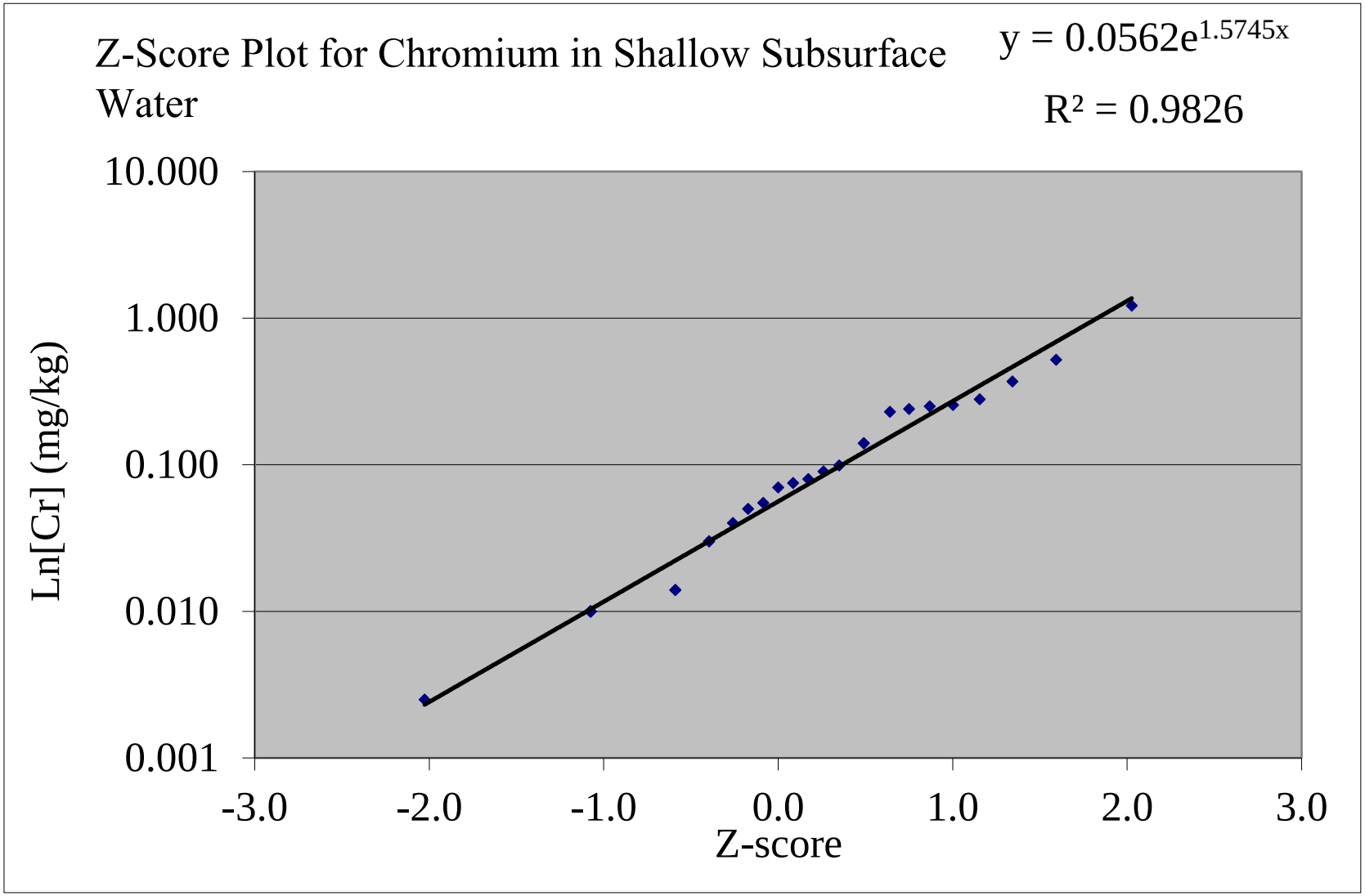
Conclusion: Visual inspection of the data does not indicate more than one data population is present.

Figure B-5.5
Probability Plot for Cadmium in Shallow Subsurface Water
Northeast Cape, St. Lawrence Island, Alaska



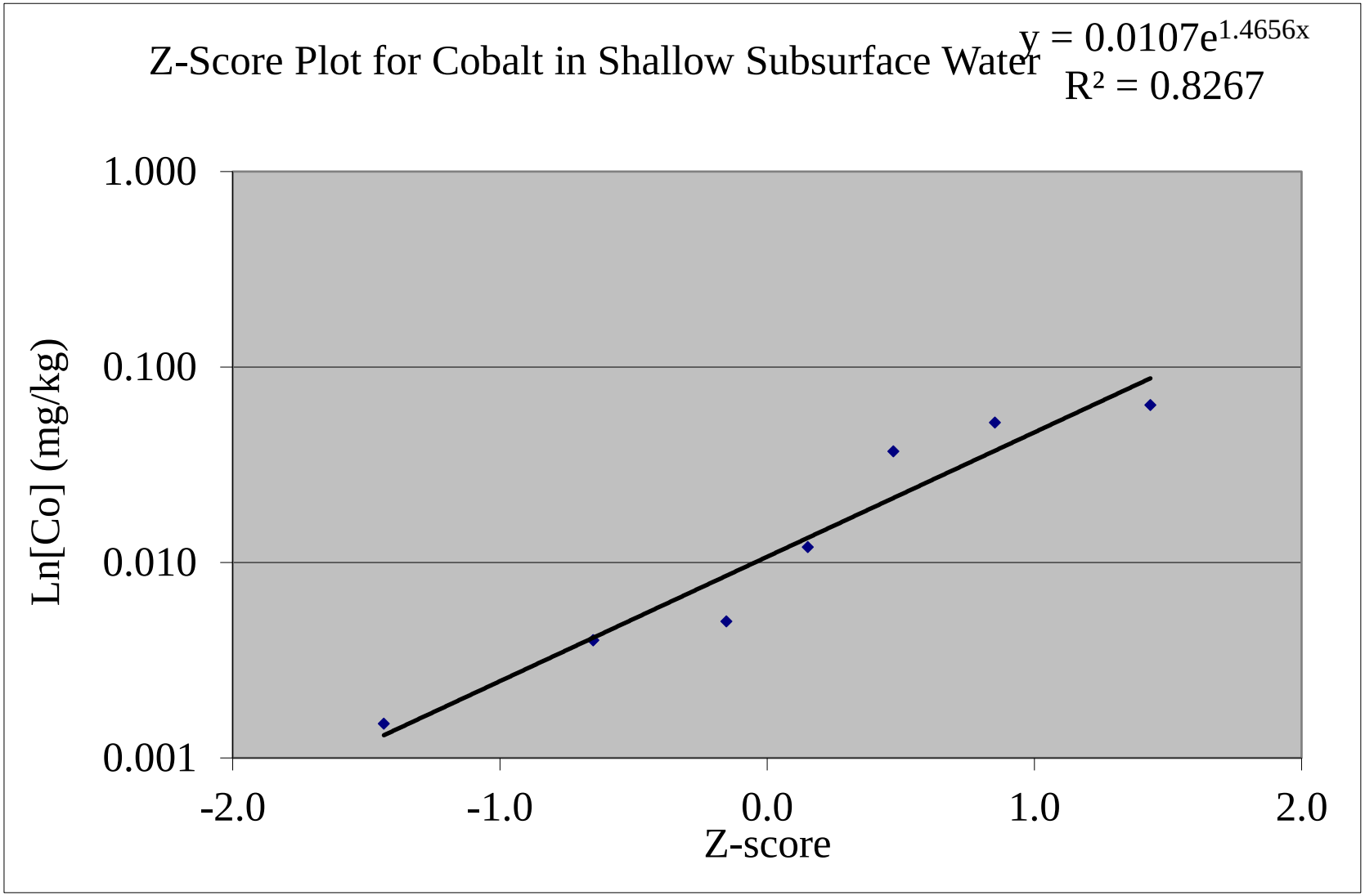
Conclusion: Visual inspection of the data does not indicate more than one data population is present.

Figure B-5.6
Probability Plot for Chromium in Shallow Subsurface Water
Northeast Cape, St. Lawrence Island, Alaska



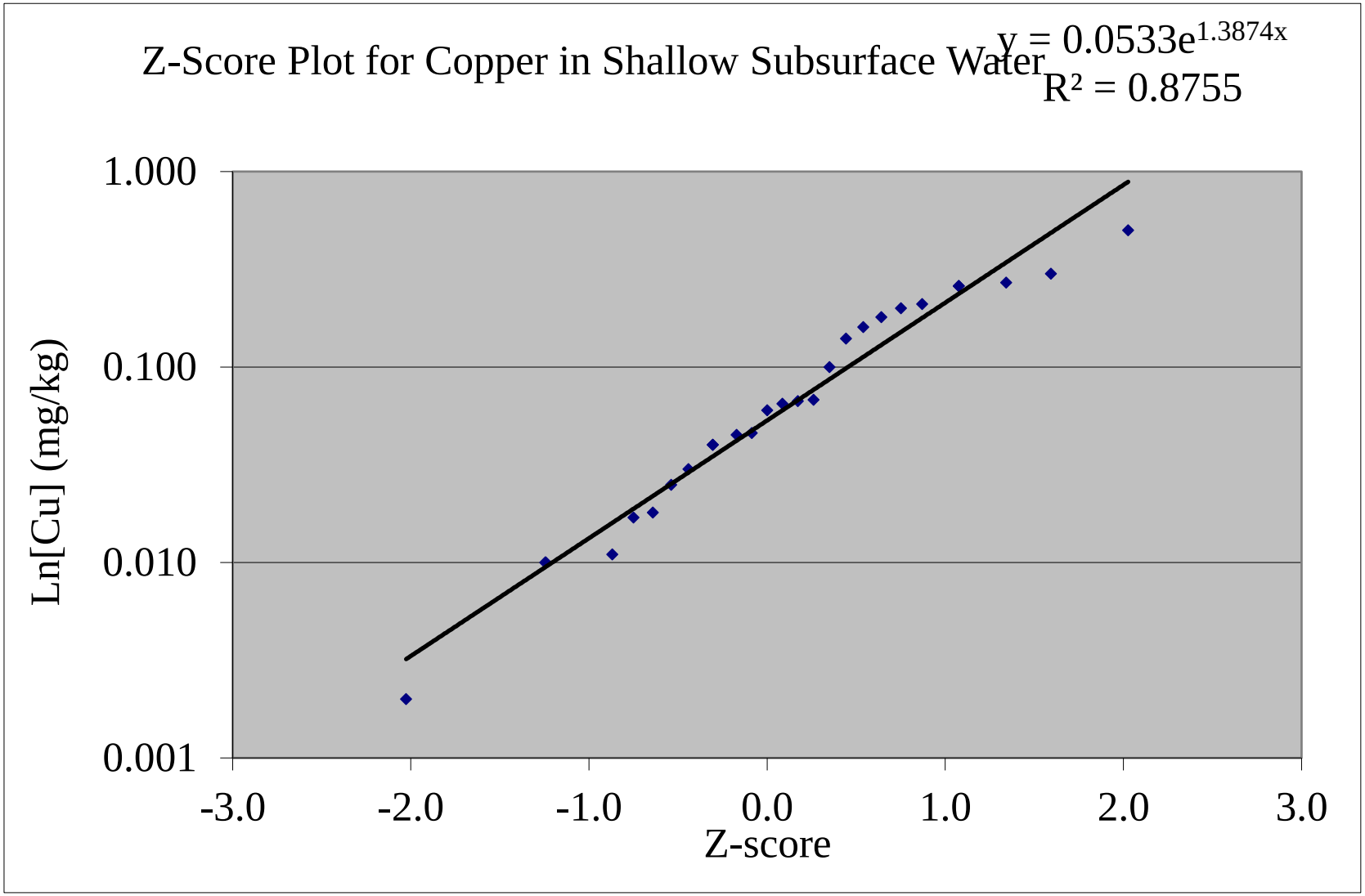
Conclusion: Visual inspection of the data does not indicate more than one data population is present.

Figure B-5.7
Probability Plot for Cobalt in Shallow Subsurface Water
Northeast Cape, St. Lawrence Island, Alaska



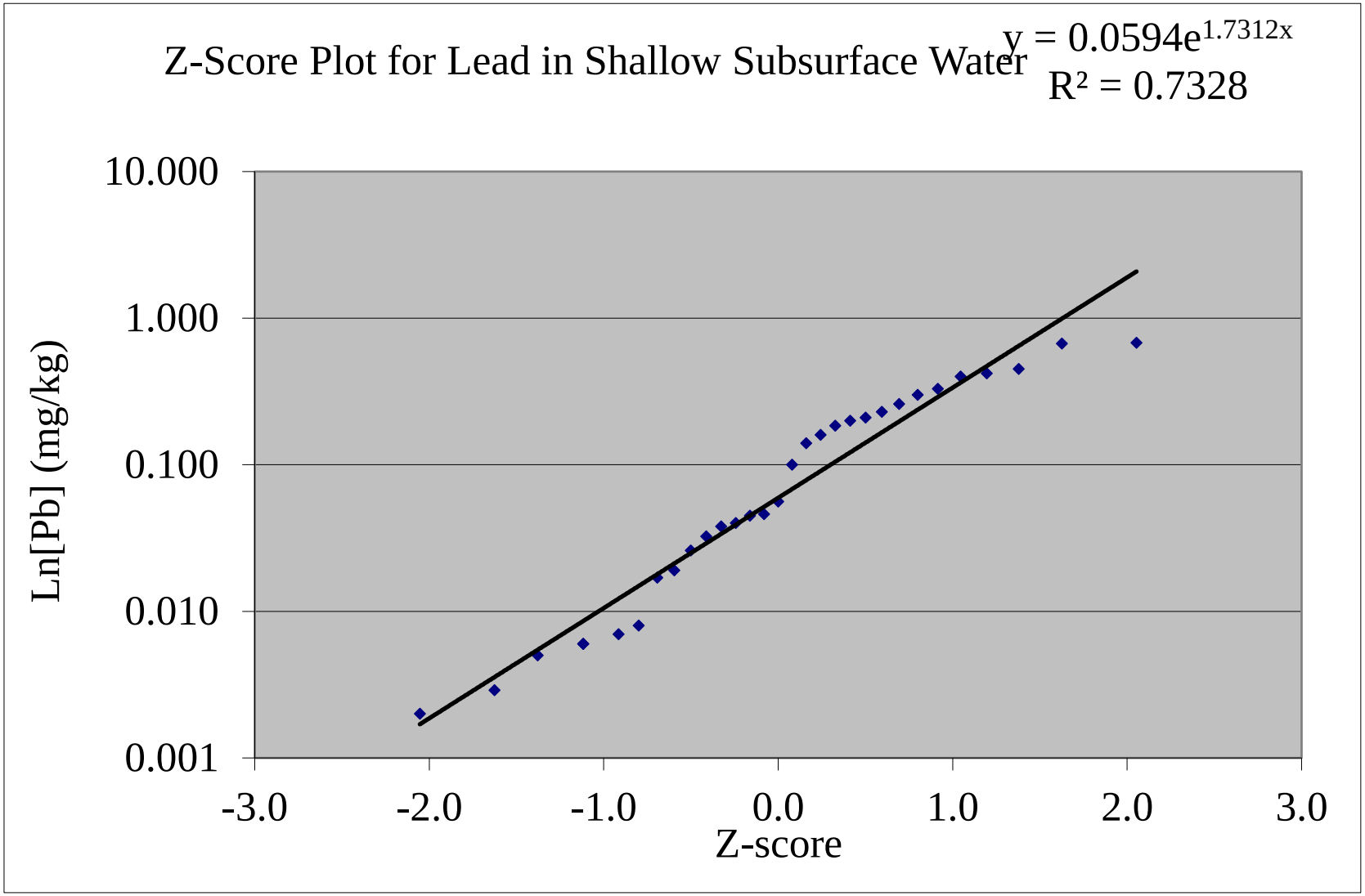
Conclusion: Visual inspection of the data resulted in an elimination of values greater than 0.005 mg/L.

Figure B-5.8
Probability Plot for Copper in Shallow Subsurface Water
Northeast Cape, St. Lawrence Island, Alaska



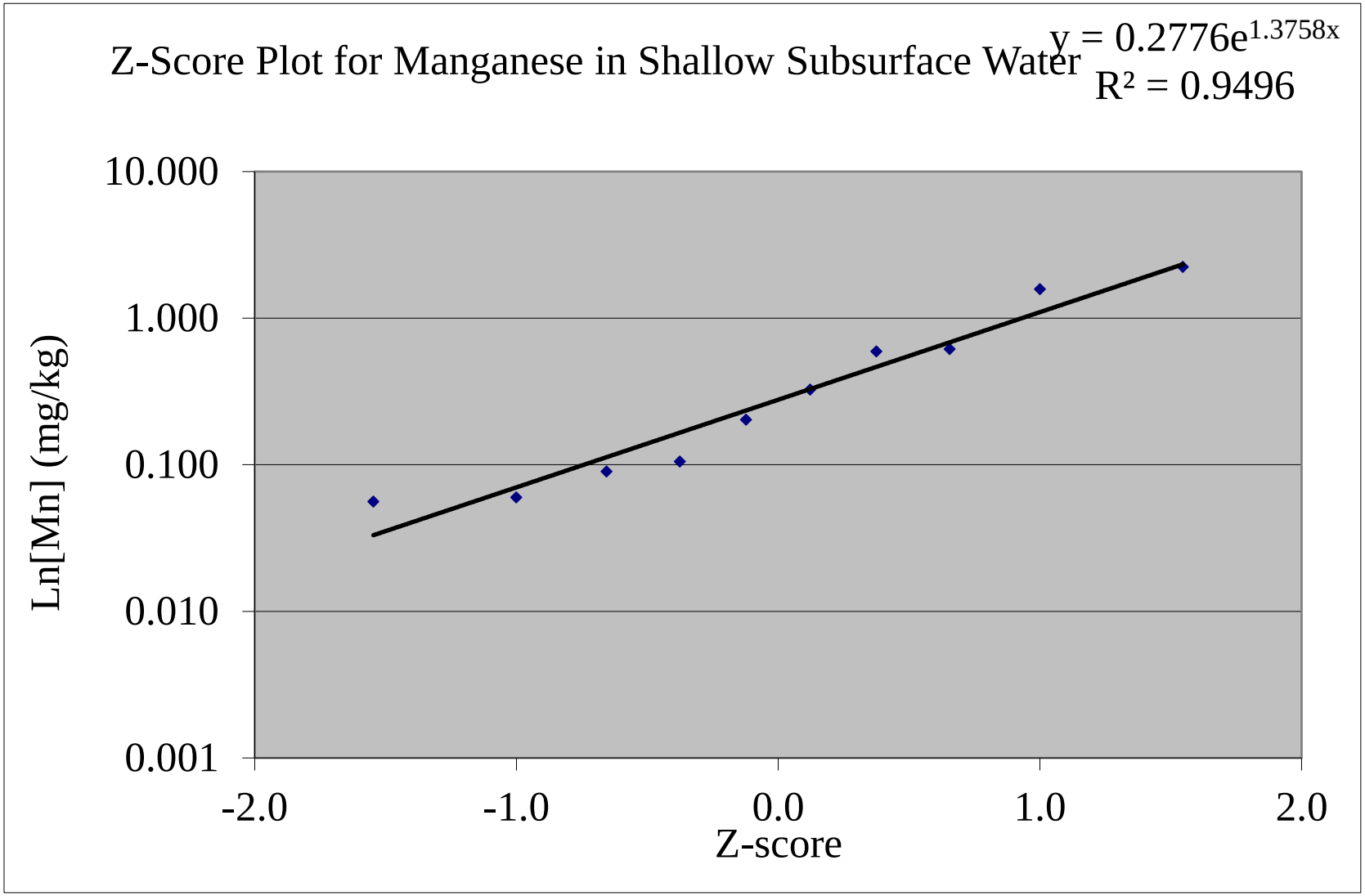
Conclusion: Visual inspection of the data resulted in an elimination of values greater than 0.068 mg/L.

Figure B-5.9
Probability Plot for Lead in Shallow Subsurface Water
Northeast Cape, St. Lawrence Island, Alaska



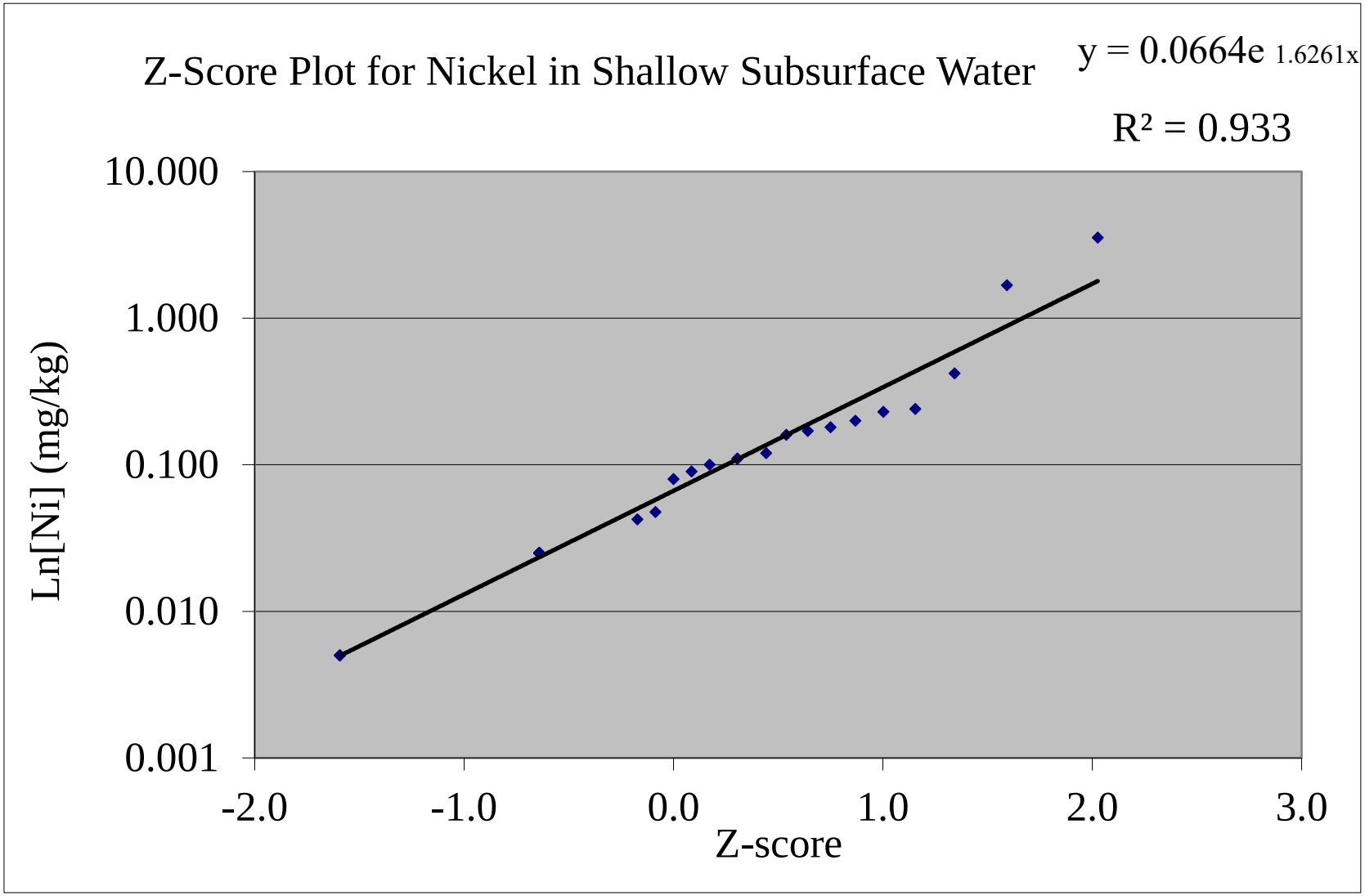
Conclusion: Visual inspection of the data resulted in an elimination of values greater than 0.008 mg/L.

Figure B-5.10
Probability Plot for Manganese in Shallow Subsurface Water
Northeast Cape, St. Lawrence Island, Alaska



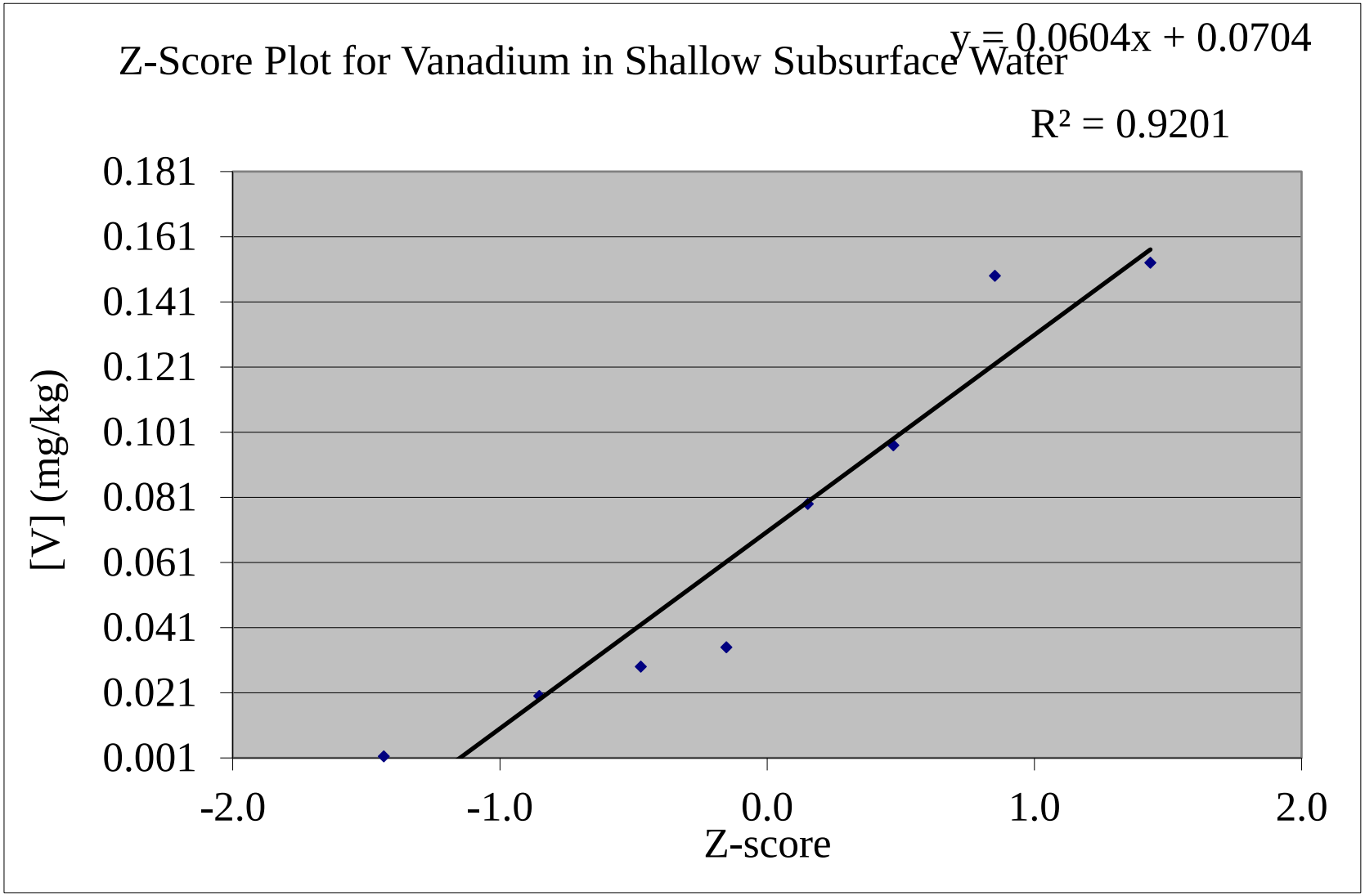
Conclusion: Visual inspection of the data resulted in an elimination of values greater than 0.105 mg/L.

Figure B-5.11
Probability Plot for Nickel in Shallow Subsurface Water
Northeast Cape, St. Lawrence Island, Alaska



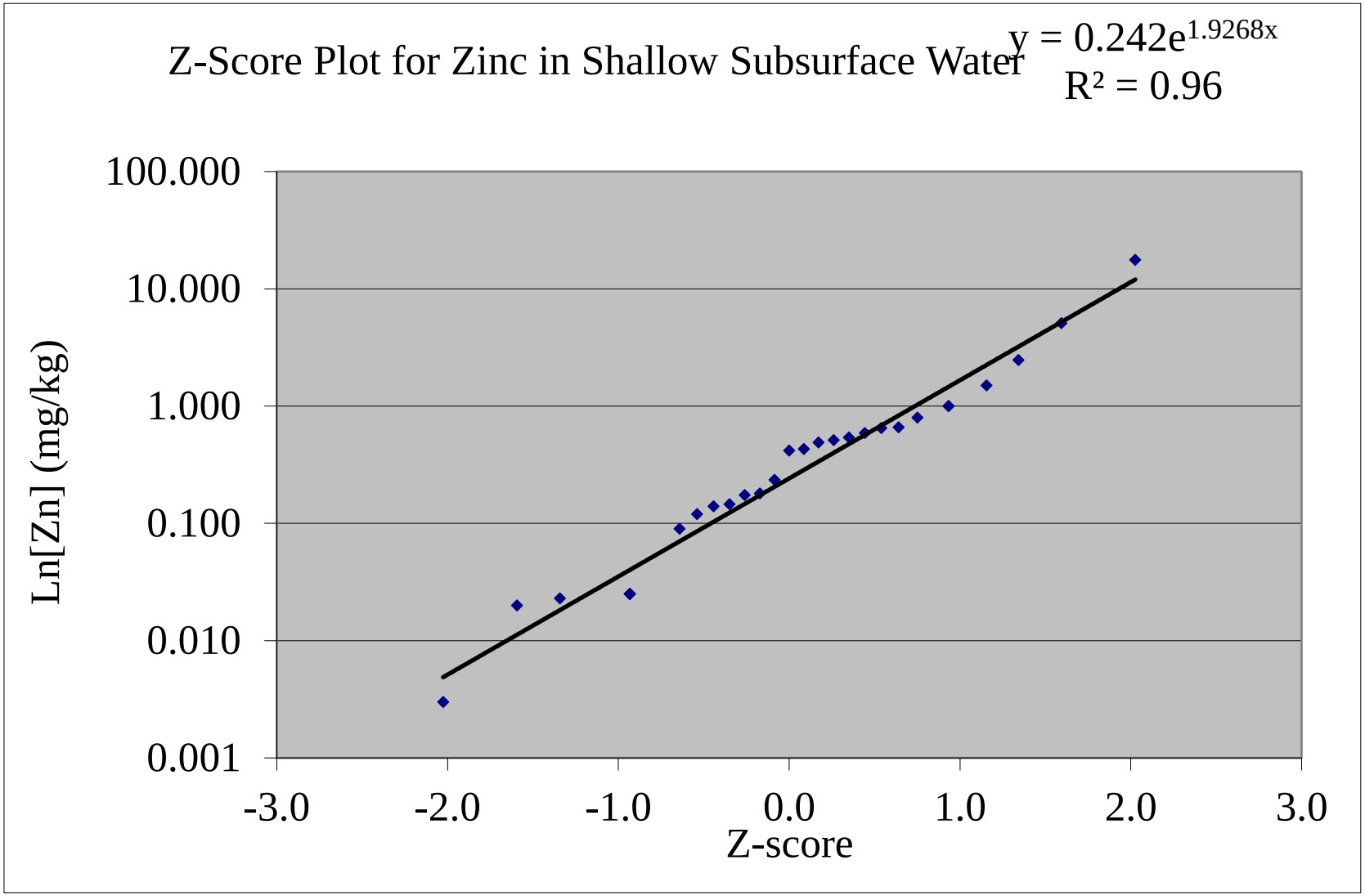
Conclusion: Visual inspection of the data resulted in an elimination of values greater than 0.0475 mg/L.

Figure B-5.12
Probability Plot for Vanadium in Shallow Subsurface Water
Northeast Cape, St. Lawrence Island, Alaska



Conclusion: Visual inspection of the data resulted in an elimination of values greater than 0.035 mg/L.

Figure B-5.13
Probability Plot for Zinc in Shallow Subsurface Water
Northeast Cape, St. Lawrence Island, Alaska



Conclusion: Visual inspection of the data resulted in an elimination of values greater than 0.235 mg/L.